CHAPTER 13
NATMAP 2050
IMPLEMENTATION METHODOLOGY
13.1 Introduction

The delivery of the NATMAP 2050 is very important. The NATMAP 2050 is a master plan that defines the course of action for transport in South Africa along with the interventions that have to be implemented to realise its bold vision and objectives. The DoT is committed to supporting the prioritised implementation of the interventions and actions defined in this important plan. The plan will require additional technical support from existing provincial and municipal transport plans as well as stakeholder cooperation for it to be fully implemented. Implementing the plan will require the ownership of relevant interventions by the agencies, provinces and local government.

Chapters 10 and 12 set out the statutory transport responsibilities and obligations of the various bodies engaged in the provision of the transport system. This chapter expands upon the previous chapters by defining how the DoT and its partners will enable the delivery of the interventions and strategies defined by the NATMAP 2050 to bring about the plan’s vision.

To this end, this chapter outlines four implementation fundamentals:

- The main implementation priorities emanating from the NATMAP 2050
- A prioritisation methodology aimed at guiding planners in implementing transport or spatial planning and applying the NATMAP 2050
- Draft guidelines on the approach to be followed to prove the business case for prioritised intervention
- A framework that measures progress towards achieving the objectives of the NATMAP 2050.

13.2 Key Implementation Priorities Emanating from the NATMAP 2050

Chapter 1 defined the national strategic priorities for transport in South Africa in response to the issues and challenges identified and strategic direction defined by current and emerging planning policy, including the NDP 2030 and the SIPs.

The mechanism to deliver the NATMAP 2050 and its vision for transport are the interventions developed to deliver the desired outputs. All interventions defined by the NATMAP 2050 have been prioritised using the goal achievement matrix (GAM) (see Annexure A), which included a broad-based consultative process among many stakeholders. The GAM includes multicriteria analysis and evaluation techniques typically used by the World Bank and the European Investment Bank for the evaluation of strategic investment projects.

The priorities were categorised as short-term (for immediate action) and medium- to long-term priorities (up to 2050). Medium- to long-term priorities are not immediate critical priorities but are necessary to provide direction and meaning to transport in South Africa over the next few decades. The priorities are identified in the following sub-sections:

13.2.1 Short-term priorities (5 years – 2015–2020)

- Refocusing public transport (including scholar transport) initiatives to be demand- and developmentally responsive, customer-focused and commercially driven within the context of integrated land use and transport
- Providing opportunities for empowerment in public transport provision
- Country-wide land transport infrastructure improvements (road and rail)
- Rural transport – improving rural mobility and accessibility to economic opportunities
- Examining the operational hours of heavy goods vehicles on public roads in support of road safety objectives. The action should include a full regulatory impact assessment, which includes the impact on labour, pricing and manufacturing competitiveness.
- Tourism and transport integration.
- Science, technology and innovation in transport.
- Supporting the green economy strategy.
- Economy

13.2.2 Medium- (2020–2030) to long-term (2030–2050) priorities

- Urban densification
- Preparing regulations on universally accessible transport
- National TDM strategy and a traffic congestion management plan
- National freight transport operations across all modes must work together to supply services to meet pit-to-port demands
- Supporting the green economy strategy
- Developing a national TOD strategy and guidelines for cities
Investing in a mobility strategy and its implementation in rural areas, providing access to transport opportunities. The delivery of these priorities can only occur by linking them to action. By linking the priorities to the interventions, projects and recommendations defined in the preceding chapters; implementation and action are established. Many of the interventions and projects were not costed and business cases have not been developed for each of them. To achieve action, many of the interventions and projects need further investigation and scrutiny based upon more detailed analyses, feasibility studies, costing exercises and business case development.

The preceding chapters highlighted the priority interventions recommended for implementation. Summarised below are the short-term interventions.

13.2.3 Proposed short-term interventions in support of the current MTSF

It is imperative that the recommended interventions, which will have a significant impact on transport in the short term, be implemented and that appropriate market signals be sent to strengthen transport’s role in supporting the economy. The list below represents the key short-term interventions proposed for implementation (subject to individual business case development and conversion into projects):

FINANCING, FUNDING & CHARGING

- Investigate and develop a policy position on clarifying the government’s commitments to subsidising transport infrastructure and services, including those provided by state agencies and companies.
- Develop a policy position and methodology for cost determination and marginal allocation by publicly owned transport agencies and companies.
- Develop guidelines on congestion charging and its application in the wider context of a national transportation demand management strategy.
- Establish and implement the single-transport economic regulator (STER), which will ensure that the previous two recommendations are applied in a consistent manner across modes. In the meantime, the interim rail economic regulator will concentrate on non-tariff aspects of rail economic regulation (regulating third-party market access, monitoring service levels, ensuring sufficient capacity, setting and assessing standards, dealing with customer grievances, etc.).
- Develop a policy position on what constitutes commercial and social infrastructure and an approach to how social infrastructure can be financed and funded. Examine the merits of mass-distance charging and cross-border charging to commercial road haulage and define a road map for implementation.

ROAD SAFETY

- Implement the interventions associates with the 5 core pillars of road safety as described in the emerging National Road Safety Strategy 2016-2030, in relation to:
  - Road safety management
  - Safer roads and mobility
  - Safer vehicles
  - Safer road users
  - Post-crash response
- Prioritise the development of safer road infrastructure for all users particularly where infrastructure is known to contribute to accidents / incidents.
- Compulsory road safety audits should be undertaken, in collaboration with the Road Transport Management Corporation (RTMC) and reviewed every 5 years in accordance with the policy intent of the Draft NMT Policy.
- Department of Transport, via the RTMC, to educate appropriate personnel in undertaking road safety audits.
- Development of a National Traffic Accident Databank.
- DoT to create a road safety forum to facilitate an integrated approach to road safety management and traffic data collection, monitoring and reporting on road crashes via the RTMC – data to feed into National Traffic Accident Databank.
- The Departments of Education, Health and Justice should become involved in road safety management, as road safety is a co-responsibility and multi-disciplinary, multi-dimensional challenge.
- Upskill and train personnel at Provinces, Metros and other local authorities involved in road safety management to maintain a minimum level of skilled personnel.
- Completion of the roll out of the driver de-merit system by the RTMC.
- Develop and implement Workplace Road Safety Management Systems – employers will be required to develop such systems as parts of their Health and Safety and quality management systems. A suitable legal mechanism and lead agency (e.g. RTMC) is to be identified to ensure compliance of the intervention. The system should include the following elements:
  - Driver training to ensure competence
  - In vehicle monitoring systems
  - Mobile phone engagement
  - Journey management
  - Driver fitness and alertness
  - Vehicle specification (fit for purpose)
- Implement an average (variable) speed limit strategy in metropolitan areas and at known accident locations and or seasonal implementation. The intervention aims to balance the needs of traffic flow with the safety of all road users by applying consistent and coherent speed management.
- Implementation of vehicle speed activated signs.
Enhancing road safety measures (e.g. traffic calming, education, infrastructure design engineering to reduce vehicle speeds etc) in areas of previously disadvantage – there is a strong correlation between accidents in such areas involving the vulnerable, pedestrians and children. Strengthen capacity and enhance funding in support of Community Road Safety Forums.

Implement rider improvement programme – aimed at offenders to improve awareness of positive driving behaviour and a positive responsible approach to prevent unnecessary deaths and injuries to fellow road users. Investigate implementation via the provisions of AARTO.

Encourage the use of rail transport through local level IRPTN’s, ITP and LITP’s in geographical areas where PRASA operates passenger rail services.

**PASSENGER TRANSPORT**

- Demand- and developmentally driven public transport systems planning – Whilst it is financially unsustainable to provide full demand-responsive public transport as a social service (heavily subsidised) up to 2050, due consideration must be given to a package of measures that will lift many South Africans out of poverty to enable the provision and affordability of world-class public transport – so that public transport will be seen not as a mode that caters for the poor, as it has been, but as a system that caters for all as a mode of choice.
- In dealing with the issue of the role of the different spheres of government in passenger transport, resulting in 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 the 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.
- Development of a modal technology choice framework to ensure that the appropriate modes of passenger transport or other forms of transport are provided in relation to identified passenger demand.
- Implementation of densification plans in brownfield developments must be encouraged, protecting greenbelt areas to prevent further urban sprawl.
- Development of an overarching public transport subsidy policy that incorporates all modes of public transport to subsidise users and not the operators.
- 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 to allow for the alignment of spatial and geographical development, population densities and land use patterns with appropriate modal and infrastructure responses based on technology choice analysis. Apply developmental approaches, particularly in rural areas, where sufficient passenger numbers do not exist to satisfy the classic demand drive model of predict and provide.
- Long-term financial viability and funding mechanisms for the ongoing and ever-increasing operational costs of services must be established.
- 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, the elderly, young children, language with the roll-out of future passenger transport and the retro-fitting of current vehicles and facilities. The guidelines need to define a suitable roll-out period with regard to funding implication and costs to the industry.
- Implement Moloto corridor passenger transport services.

**LAND USE**

- Informal economic activity survey: The analysis of economic activities and population needs in the informal sector of the economy and commercial and subsistence agricultural activities requires research and detailed data collection. The purpose of collecting the data is to determine the needs of the population members who earn their income in these segments to enable spatial, infrastructure and transport planners to provide context-sensitive solutions and to enhance and build on the existing economic activities. Furthermore, changes required in policy and legislation can be informed through this data.
- Land policies: Given the continued influx of the population to more economically developed metropolitan and other urban areas, an integrated approach between land use planning, housing provision, municipal services, social amenities and public transport provision should be implemented by all spheres of government. Detailed policies relating to land use and transport planning are provided in chapter 5 of this report.
- Densification and corridor infill development: The use of vacant land and property within built-up areas should take place along public transport corridors to improve public transport ridership. The provision of community facilities should become a priority in nodes supported by transport corridors.
- Development of rural areas: to provide infrastructure that promotes sustainable economic activity to minimise the emigration of people from rural areas and to maintain rural transport infrastructure. Beneficiation (industrialisation) around the primary sector needs to be
strengthened to support and enhance economic growth and job creation in rural areas.

- **Demand-driven, developmental and responsive public transport systems planning**: A large proportion of South Africans are categorised in the low-income bracket and are dependent on public transport to access opportunities. This statistic is projected to reduce over time, given the implementation of sufficient supporting economic job-creating measures.

- **Investment in infrastructure**: promotes continued investment in infrastructure in urban and rural areas.

- **Guidelines**: Establish guidelines about the socio-economic role and financial implications of transport in South Africa.

- **Development of special economic zones (SEZs)**: SEZs are critical to the government’s objectives to advance industrialisation, rural development, job creation as well as attract foreign direct investment (FDI). Special arrangements must be made for supporting infrastructure to support these developments. Transport network planning and transport services implementation should be aligned with and support SEZs.

- **Support SPLUMA** and the implementation of the IUDF (Draft).

- **Implementation of the urban network strategy** and 18 identified urban nodes, focusing on infrastructure spending, public transport system development, housing and urban management.

**RURAL TRANSPORT**

- Establish a national strategic rural transport network plan (connecting major nodes e.g. 18 cities) that focuses investment and unlocks economies of scale.

- Support beneficiation (industrialisation) around the primary sector in rural areas to support and build

- **Population numbers** – this will strengthen the affordability of rural transport provision.

- **Introduce a comprehensive non-motorised transport and intermediate means of transport programme in rural areas** supported by the development of a strategic off-road infrastructure network implementation plan. The plan will promote initiatives, including paths and tracks for non-motorised transport modes, to provide better access to mainstream infrastructure, incorporate cycling, animal drawn carts, etc.

**INSTITUTIONAL**

- The legislative establishment of the NTF and the strengthening of its role to consolidate stakeholder and institutional alignment.

- The development of multimodal legislation to guide and direct multimodal coordination and planning and the establishment of appropriate approved entities.

- Provision for giving effect to the establishment of provincial transport investment funds.

- An examination of whether the multiple government portfolio model adversely affects strategic coherence and decision-making ability (with reference to the example highlighted in Section 10.2).

- The supporting of processes embarked on to develop legislation that seeks to respond to the need for the establishment of the STER.

- The creation of the proposed consolidated transport databank to serve as a technological data and information solution.

- An enhancement of regional harmonisation and integration by way of the review and liberalisation of the regulatory framework of South Africa in support of the development of integrated regional corridors as discussed in Chapter 7.

**TRANSPORT DEMAND MANAGEMENT**

- Develop national road transport demand management guidelines and individual traffic congestion management plans for all metros.

**URBAN TRANSPORT AND SMART CITIES**

- Develop national TOD guidelines appropriate to urban and rural environments with respect to “how to plan”, “where to plan” and “how to implement”.

**TOURISM AND TRANSPORT**

- Ensure that the tourism sector plays a critical role in tourism planning.

- Enhance tourism through explicit consideration in IDP’s and IRPTN’s.

- Ensure that tourism coordination be included in all relevant government departments associated with planning, project development, traffic engineering, construction, maintenance and public relations.

- Ensure proactive involvement of tourism groups in the transportation planning process.

- Utilize tourist-related travel data in transportation planning, possibly including joint funding of data collection efforts.

- Recognize institutionally that traveller information services are an integral element in all transportation projects designed to enhance tourism, including providing up-to-date and relevant travel information to specific markets.

- Department of Transport encourages cooperation with the Department of Tourism.

- In further developing the land transportation service in South Africa, the following guidelines should apply:
  - Consider training taxis and other disadvantaged transport operators in order to enhance their services
and allow them to play an important role in the tourism industry.

- Encourage entrepreneurship in the provision of transportation services.
- Improve the linkages and coordination among different forms of transportation.
- Encourage more open competition.
- Encourage strategic alliances with other stakeholders in the industry.
- Expand the range and accessibility of different transportation options to visitors.
- Consider the safety and standards of land transportation services to satisfy the needs of tourists (domestic and international).
- Department of Tourism to work closely with the Department of Transport to improve land transportation services for both the domestic and international tourism industry and eliminate bottlenecks that may arise.
- Consider the formation of a Tourism Transportation working group to address and coordinate all issues of mutual interest (applicable both to air and land transportation).

SCIENCE, TECHNOLOGY AND INNOVATION IN TRANSPORT

- The Department of Science and Technology will work more closely with the Department of Transport to investigate how to respond to impending disruptive technologies in the transport industry.
- The following emerging technologies will be investigated with a view to support transformation of the transport sector:
  - Autonomous Vehicles
  - Connected Vehicles
  - Collaborative Consumption
  - Electric Drivetrain
  - Efficient Multimodal Network
  - New Materials (including 3d printing)

ENVIRONMENT AND ENERGY

- Invest in the research and development of alternative green vehicle technology, e.g. light rail transit (LRT) as well as fuel efficiency.
- Develop incentives to encourage modal shifts from less energy efficient modes of transport (e.g. road and short-haul air) to more energy efficient modes of transport (e.g. rail).
- Reinvigorate environmental due diligence in transport infrastructure development.
- Create and implement a sustained energy awareness programme to raise public awareness of the true financial and environmental costs of transport modes with high carbon and energy intensities.
- Plan for new long-distance transportation infrastructure (e.g. long-distance trains) with lower energy intensity than road transport, provided that the proposed interventions meet the minimum distance threshold for the proposed transport infrastructure to be cost-effective and to compete with other forms of transport.
- Quantify energy consumption by rail and road transport for identified key transport corridors and formulate a transportation energy reduction strategy.
- Actively implement:
  - the DoT transport energy consumption reduction strategy
  - the Nationally Appropriate Mitigation Actions (NAMAs) identified in the DoT Greenhouse Gas Emission Reduction Strategy for the Transport Sector (GHGERS).
- Develop and implement transport-sector specific programmes and projects that support (where appropriate) and align with South Africa’s Nationally Determined Contributions (NDCs) as agreed at COP 21.
- Relevant DoT stakeholders to define actions for the transport sector to support the Agri Park concept in terms of:
  - accommodating the Agri Park concept into the freight logistics value chain
  - Linking Agri Parks to the urban environment in terms of appropriate road, rail and air infrastructure
  - Linking Agri Parks to the urban environment in terms of public transport infrastructure and services
  - Linking Agri Parks to the urban environment in terms of non-motorised transport

ECONOMY

- Consider modifying the infrastructure grant system to involve all sectors in creating joined up programmes.
- Refocus the neighbourhood development partnership programme to support the development of economic hubs in large urban townships.
- Reform the system of development charges to improve fairness and transparency and reduce delays in infrastructure provision for private land developments.
- Expand opportunities for private investment in municipal infrastructure.
- Review the sustainability of existing own-revenue sources for metropolitan municipalities, particularly in light of their expanding responsibilities in public transport and human settlements.
- Continue integrated land use and transport planning, as spatial development and planning are important considerations to any integrated forward planning activities that have an economic impact.
INFRASTRUCTURE

ROADS

- Preventative road maintenance:
  - Improve the maintenance of the life cycle of roads at optimum levels, which will minimise costs.

- Moloto Road:
  - Upgrade the Moloto Road to improve safety and mobility.

- N3 Durban–Pietermaritzburg capacity improvements:
  - The upgrade will include a proposed Pietermaritzburg ring road and rerouting of the N3 near Hammarsdale.
  - Capacity improvements on the N3 aim to enhance the network’s functionality and safety by providing an alternative route and splitting light and heavy traffic to ensure that both routes operate at optimal levels without bypassing opportunities (e.g. Harrismith).
  - A complementary solution is being developed in support of the Harrismith freight logistics hub, the Tsilame gateway and the N3 De Beer’s Pass.

- Pongola and eDumbe Road upgrade:
  - The project will entail the upgrading of the D-1867 road off the N2 between Pongola and Piet Retief from gravel to tar.

- N3TC:
  - Entails the rehabilitation of specific sections, including sections between Harrismith and Warden and sections between Cedara and Tweedie near Howick.

- N2 Wild Coast Highway – construction and upgrading:
  - Entail the construction of new highway sections (17-km section between Ndwalane and the Ntafufu River and a section between Lusikisiki and the Mtmvuna River, including 6 large bridges across the following rivers: Msikaba, Mtentu Mnyameni, Kulumbe, Mpahlane and Mzamba.
  - Involve the upgrading of the existing R61 between the Ntafufu River and Lusikisiki, a distance of about 17km, including a new interchange at Lusikisiki.

- Gauteng:
  - Construction of PWV9.
  - Construction and implementation of Class 2 routes in all municipalities.
  - Various road upgradings (K29–Malibongwe Road/ Johannesburg–Brits interprovincial road, roads providing connectivity to the OR Tambo International Airport – PWV15, K86 link, K88 link).

- KwaZulu-Natal:
  - Provision of a new heavy-haul route from the N2 to Cato Ridge (SIP 2).
  - Provision of heavy-haul route between Richards Bay and Melmoth (SIP 2).

- Western Cape:
  - New weighbridges.
  - Capacity improvements on various roads (M7, R302, R310, R300).
  - Doubling of the Huguenot Tunnel.
  - Bypass around Knysna.

- Free State:
  - Strategic gravel road upgrades in all district municipalities.

- Mpumalanga:
  - Upgrading of the coal haulage roads in the province (SIP 1).

- Limpopo:
  - Upgrading of coal haulage roads in the province (SIP 1).

- Northern Cape:
  - Road upgrades and capacity improvement (N12 between Warrenton and Klerksdorp).

- North West:
  - Road upgrades and capacity improvement (N18 between Setlagole and Vryburg).

- All provinces:
  - Elimination of backlog in maintenance of road network of national importance.

- Periodic and routine maintenance to road network of national importance.

RAIL

- Freight transport interventions
  - The NATMAP 2050 package strategy envisaged for freight rail includes an optimised road–rail modal split strategy and identifies rail infrastructure development interventions.
  - Alternatives to optimise road/rail infrastructure assets to provide greater efficiency at lower cost will be executed through the development of this detailed strategy and the specification of regulatory measures and a time programme. This will include the following alternatives:
    - A monitoring programme
    - An information database as part of the DoT central database system, supplemented by a legalising process to enforce the strategy to obtain an acceptable balance between road and rail freight.

- Proposed passenger rail interventions
  - Categories need to be introduced for passenger rail, ranging from metropolitan, suburban low-speed commuter and intercity low- and medium-speed systems, to intercity high-speed systems. These passenger rail categories are classified in terms of service distance, speed, station spacing, and target markets.
  - It is envisaged that, by 2050, all metropolitan areas, and high-density and -income district centres will have a rail commuter system. Based on modal threshold specifications, residential areas will connect with central business districts (CBDs). Similarly, linkages and the integration of various passenger transport systems and modes will be implemented by means of transfer facilities and ticketing systems.
  - Profiles will be specified for rail systems in metropolitan/urban areas for intercity medium-speed and -distance corridors, and for high-speed systems along all national corridors. All international airports
will be linked to city centres and other rail commuter systems.
- Rail priorities and programmes for various long/medium-distance high/medium-speed corridors are:
  - Durban–Free State–Gauteng (N3) corridor, (Gauteng–KwaZulu-Natal).
  - Moloto corridor to Mpumalanga.
  - N1 (Gauteng–Limpopo–Free State–Western Cape).
  - Moloto corridor (second phase into Limpopo).
  - North West corridors to Gauteng.
  - Cape Peninsula – northern districts.
  - N4 corridor from Tshwane to Mbombela (2020–2030), N2 tourism corridor (Cape Town–George–Nelson Mandela Bay–Ethekwini), ThabaNchu–Bloemfontein, and other similar medium-distance commuter corridors that are still to be subjected to feasibility studies.
  - Interregional connections with Zimbabwe extension of N1 rail corridor (via Beit Bridge to Harare), Namibia extension of N1 corridor (via Bloemfontein, Kimberley, Upington, Windhoek), Mozambique extension of N4 corridor (via Mbombela to Maputo), Botswana extension of Platinum corridor (via Rustenburg, Zeerust, Gaborone).

Waterberg–Mpumalanga–KwaZulu-Natal rail link (part of SIP1)
- Unlocking the northern mineral belt with Waterberg as catalyst. In July 2014, Transnet issued tenders to allow for formal investigations into the rail requirements of the Waterberg region. Transnet wants a prefeasibility study on the Waterberg infrastructure and feasibility studies on the rail infrastructure linking the coal-mining town of Lephala in Limpopo with Erinemo in Mpumalanga, which is a key coal-logistics junction. The studies are expected to be finalised by August 2015 and will form part of a plan to connect the coalfields in Waterberg, as well as those in Botswana, with export terminals in KwaZulu-Natal, as well as with Eskom’s power stations.

SIP2: Durban–Free State–Gauteng logistics corridor
- According to freight forecasts, it is expected that, in the next 25 to 30 years, containers moving from the Port of Durban to Gauteng will grow almost eightfold, from about 1.75 million a year today to 13 million a year. Without a new rail line, these expected increases in freight will see a disastrous mushrooming in the number of freight trucks travelling between the port and South Africa’s economic hub. The existing rail line is in a poor condition and has speed limits in some places of as low as 50km/h. The new rail line will be built to have a maximum speed of 120km/h and will largely be dedicated to carrying freight.

SIP3: South-eastern node and corridor development
- Upgrading of port and rail capacity, construction of a new dam in Umzimvubu in the Eastern Cape, construction of rail infrastructure to transport manganese from the Northern Cape to Port Elizabeth, construction of a manganese sinter facility in the Northern Cape and a smelter in the Eastern Cape.

SIP5: Saldanha–Northern Cape development corridor
- Expansion of rail and port infrastructure in the Saldanha area, construction of industrial capacity at the back of these ports (including a possible industrial development zone), strengthening maritime support for the gas and oil activities along the western coast, expansion of iron ore mining production.

SIP10: Electricity transmission and distribution
- Alignment of freight rail line development with the 10-year energy transmission plan.

SIP11: Agri-logistics and rural infrastructure
- Investment in infrastructure such as storage facilities, transport links to main networks, the fencing of farms, irrigation schemes to poor areas, agricultural colleges, processing facilities (including abattoirs) and rural tourism. Expansion of transport links to main networks (rail roads, branch-line, ports).

SIP17: Regional integration for African cooperation and development
- Investment in mutually beneficial projects in the free trade area, encompassing East, Central and Southern Africa. Projects involve transport, water and energy.

PRASA rolling stock renewal programme
- PRASA is undertaking a R123 billion investment over a 20-year period to renew its rolling stock fleet. This programme will entail the introduction of more than 7 000 new rail vehicles for passenger transport purposes. The entire PRASA fleet is expected to be fully replaced by 2034.
- A R51 billion contract for the first phase of the programme was signed in October 2013 with Gibela Rail Transportation, with commercial close on the contract achieved in April 2014.
- The contract is for the supply of 600 passenger trains, comprising 3 600 coaches, for delivery between 2015 and 2025.

PRASA passenger rail infrastructure improvements
- An estimated R15.2 billion has been set aside for PRASA to expand and develop its network.
- About R12 billion has been set aside by PRASA to upgrade and improve its stations across South Africa. An estimated 23 stations were set to undergo modernisation in 2013, and 64 in 2014. A third phase will involve the modernisation of 50 intermediate, small and halt stations.
- A further R7 billion has been set aside for the improvement of bridges and platforms.

PRASA signalling system (Gauteng/KwaZulu-Natal)
- The project is valued at an estimated R17 billion to implement a new, technologically advanced signalling system by 2018. The project will include the modernisation of the rail signalling, communications and train management systems in high-volume corridors such as Naledi in Soweto, Pretoria to Johannesburg, Mabopane to Pretoria, Mamelodi to Pretoria, KwaMashu–Durban–Umlazi, Khayelitsha,
Mitchells Plain and Philippi to Cape Town, Kraaifontein–Belville–Cape Town, and Simon’s Town to Cape Town.

- Transnet rolling stock renewal programme
  - Transnet is undertaking massive infrastructure and rolling stock investments at TFR as part of its market demand strategy to facilitate the ambition of increasing the volume of freight transported on rail. These investments include expenditure on TFR’s coal, iron ore and manganese export capabilities, as well as on its general freight business. As part of this expenditure, in early 2014, Transnet awarded locomotive supply contracts valued at R50 billion.
  - Contracts for the supply of 599 electric locomotives and 465 diesel locomotives for GFB, which form the so-called 10-64 programme, have been awarded to consortiums led by four global manufacturers – GE, China North Rail (CNR), CSR and Bombardier Transportation. The first locomotives that form part of the 10-64 programme will be delivered in September 2015 and the final batch in February 2018.
  - In addition to its locomotive-related investments, TFR is undertaking a wagons fleet programme. In the year that ended March 2014, 3 281 wagons were built at Transnet facilities across the country.

- Gautrain system enhancements
  - In 2014, a prefeasibility was commissioned and successfully carried out for the following extensions under the Gautrain Phase 2 development:
    - Extension 1: New line from Mamelodi in Tshwane to Naledi in the south of Johannesburg.
    - Extension 2: Extensions from the OR Tambo International Airport to Boksburg.
  - Other system enhancements in the pipeline include the provision of additional parking at certain stations and the lengthening of the OR Tambo International Airport station to allow for four-and-a-half carriages to open on the platform, up from two-and-a-half carriages.

- Gautrain rolling stock
  - A business case is to be developed for the buying of new rolling stock to further increase capacity. The current Gautrain fleet consists of 96 rail cars and reconfigured seating is being considered for the Pretoria–Johannesburg line. Also under consideration is a special, quick-turnaround service on the system’s busiest route, between the Sandton and Centurion stations.

- Gautrain expansion routes
  - Four possible expansion routes are being considered:
    - Link from Park station, underneath the city, to Westgate.
    - Link from Rhodesfield station to Boksburg.
    - Link from Sandton station in Randburg and Honeydew.
    - Link from Naledi, Soweto, to Mamelodi, through either the proposed Samrand station or the existing Midrand station.

- Moloto Road integrated rapid rail solution
  - An integrated rapid rail solution is to be implemented on the Moloto corridor, which carries more than 35 000 commuters daily to Gauteng.

- Tambo Springs inland port and logistics gateway super terminal
  - Tambo Springs is planned to accommodate a new state-of-the-art rail terminal facility as well as an intermodal rail yard capable of handling point-to-point movement of freight using block trains up to 2km in length. This is possible because the Tambo Springs property has an existing dual-directional freight rail line that runs along the north western boundary for approximately 3.5 km.

- Manganese export line
  - TFR is developing the rail network between the manganese-rich Northern Cape and the Port of Ngqura in the Eastern Cape to become the utility’s third heavy-haul export channel. The development aims to increase South Africa’s annual manganese export capacity to 16 million tonnes. The business case for this expansion was completed in November 2013. Earlier in 2013, Transnet indicated that TFR would invest R10.8 billion between 2012/13 and 2018/19 in rolling stock and infrastructure to support the manganese corridor project. The manganese export line development also involves port-related expenditure, including at the Ngqura manganese terminal.

- Cross-border rail corridors
  - There is a strong link between rail and the extractive commodity sectors that are considered key drivers of economic growth in Africa. A regionally linked rail network will enable the more efficient transport of these commodities to the export centres, improving the region’s supply chain capability and enhancing its level of international competitiveness. The long-planned South Africa–Swaziland rail link is an example of intraregional cooperation focused on the development of symbiotic rail corridors.

- South Africa–Swaziland rail link
  - A prefeasibility study was completed in March 2013 and feasibility studies for South Africa and Swaziland’s R17 billion rail link was completed towards the end of 2014. Construction is estimated to commence in 2017. The railway line is set to increase general freight and coal export capacity. It will link Lothair in Mpumalanga with Sidvokodvu in Swaziland and free up capacity on Transnet’s network, allowing it to move additional coal to the Richards Bay coal terminal. Its construction includes a new single Cape gauge line covering 146km to be built by Transnet. It will have an initial capacity of 15 million tonnes a year. The rail link was critical for the flow of goods in the region. The Swaziland connection will enable TFR not only to remove the 12 general freight trains operating daily on the corridor but also to...
operate the coal line exclusively on heavy-haul principles. The link will divert general freight currently being moved on the Ermelo–Richards Bay line through Swaziland and, together with the introduction of new operating solutions, can potentially raise the coal export corridor’s capacity to 120 million tonnes. The completion of the first tranche of 16 million tonnes a year of additional capacity is expected in 2017/18. A further two tranches will increase the capacity of the link up to 31 million tonnes a year and, finally, to 42 million tonnes a year.

The following proposed interventions are province-specific:

- **Gauteng**
  - Johannesburg–Durban high-speed line (SIP 2)
  - Develop a regional passenger rail system: N4 corridor (Pretoria–eMalahleni–Middelburg–Mbombela–Kaapmuiden)
  - Develop a regional passenger rail system: N12 corridor (Johannesburg–Delmas–Ogies–eMalahleni)
- **Western Cape**
  - Improve ore line capacity (SIP 5)
- **KwaZulu-Natal**
  - Richards Bay–Piet Retief: Improve capacity of the coal line (SIP 1)
  - Johannesburg–Durban high-speed line (SIP 2)
- **Limpopo**
  - Moloto Jane Furse: Extend new Moloto rail corridor
  - Pretoria–Polokwane high-speed rail
- **Mpumalanga**
  - Regional rail passenger system: R40/R538
  - Develop regional rail passenger system along the N4 corridor (Pretoria–Lowveld)
  - Pretoria–Moloto new medium-speed rail line and passenger service
- **Northern Cape**
  - Hotazel–Kamfersdam (Kimberley) line upgrade (SIP 3)
- **North West**
  - Develop a regional passenger rail system on the N4 corridor
  - Develop a regional passenger rail system on the N12 corridor

**Eastern Cape**
- Cookhouse–Addo line upgrade
- Noupoort–Cookhouse line upgrade
13.3 Implemented within the Maritime Sector by developing an overarching, integrated ocean A Prioritisation Methodology to Guide Future Planning (Option Selection Process)

The NATMAP 2050 will guide the development of the future South African transport sector up to 2050. It is, therefore, important that the NATMAP 2050 contain guidance on how transport intervention prioritisation should be undertaken in identifying the investment priorities going forward.

In supporting project prioritisation at the provincial and local levels of government, a simple prioritisation methodology has been summarised below. The purpose of the prioritisation methodology is to provide additional, easy-to-understand planning support to planners executing transport or spatial planning and applying the NATMAP 2050. It can also be applied, in particular, to projects in need of review of prioritisation that is not reflected in the NATMAP 2050. The prioritisation methodology is indicative and needs further work in supporting local context and buy-in.

The process of prioritisation is referred to as the option selection process, defined as the process by means of which alternative interventions or options are prioritised or ranked in terms of meeting overarching transport objectives and/or priorities. The option selection process is objectives-led to ensure that option or project evaluation and prioritisation are not predisposed towards projects that might not be optimal or appropriate. The benefits of an objectives-led approach are that it:

- Recognises the importance of transport in supporting wider policy objectives
- Recognises the DoT’s organisational objectives and uses these to prioritise and package emerging options

The option selection process is shown in Figure 13-1 and details three basic parts:

i) Definition of the needs/objectives

ii) Identification of the preferred intervention

iii) Application of the common basis assessment framework to prioritise interventions/options in meeting transport objectives.

The sub-sections below explain each part of the process in turn.

![Figure 13-1: Option Selection Process Flow](image)
13.3.2 Defining the needs and objectives

The first stage in the option selection process includes three steps:

1) Understand the existing local context in terms of supporting planning and transport policy, implying a review and understanding of:
   - The problem we want to address within national, provincial and local planning policy contexts
   - The main issues and challenges that need to be addressed
   - Stakeholder engagement, if necessary.

2) Define the objective that needs to be addressed or achieved. This is important to ensure that an option/intervention is not predisposed towards projects that might not be optimal or appropriate. This is influenced by asking the question: "What am I trying to achieve?"
   Typical objectives could include:
   - An improved sustainable public transport system with better and safer access, more frequent and better quality services and facilities to an agreed standard
   - Greater mobility options, particularly for those who do not have cars
   - The development of a non-motorised transport network
   - Better infrastructure, a better maintained road network that links and interchanges with other means of transport
   - A transport system that is consistent with the real needs of people living in different parts of South Africa and with differing abilities to afford travel
   - A transport system that charges the traveller a fair reflection of the costs of making a journey; financial, social and environmental
   - A transport system that supports focused funding of transport priorities
   - Developed sufficient institutional human capital to drive the vision of transport

3) Define the needs – ask: "What problem am I trying to solve and why is it important to implement the project or option?" and define any gaps that needs to be filled by the proposed option intervention.

13.3.3 Identifying the preferred intervention

Once the need has been established, interventions or options are fully generated, detailed and defined. In some instances, stakeholder engagement may be necessary during this step to allow input into the intervention/option formulation process. The proposed toolkit defined in this chapter will be a useful tool in this step.

The next step in the option selection process is to undertake a high-level sift of the interventions/options identified. This is carried out by asking the following question:

"Does the intervention/option support the strategic vision and priorities of transport in terms of the following high-level criteria:

- Economic
- Environmental
- Access & Inclusion
- Safety & Wellbeing
- Integration?"

The reason for asking these questions is to establish what interventions or options do not meet the very basic requirements of supporting the strategic vision. When the answer to the question is NO for a specific project or option or package of options, it will be excluded from the detailed appraisal process (using the common basis assessment framework). When the answer is YES, the intervention or option is included in the detailed appraisal process (using the common basis assessment framework).

By following this logic, the problem, its likely solutions and appropriate transport objectives are linked.

13.3.4 Prioritisation using the common basis assessment framework

Once interventions have been developed, they will need to be prioritised using a common basis assessment during the third stage of appraisal.

This common basis assessment could be used by all authorities and stakeholders to prioritise and make decisions about option prioritisation to ensure that they help achieve the vision of a coordinated transport system before developing individual business cases for each project. Because of funding constraints, projects inevitably compete for scarce resources, and prioritisation helps define which project supports national aspirations most and, therefore, warrants further investigation for funding. The guiding principle should always be that the project should provide overall value.

In prioritising among different interventions or options, it will be important to have a clear view of these interventions’ or options’ real impacts, their relative costs, benefits and the extent to which they meet national and local strategic objectives. Interventions or options should be prioritised using the conventional transport assessment criteria of accessibility, economy, environment, safety and integration and the national strategic objectives and wider local objectives of the authority concerned reflected in the common basis assessment.

Criteria can help to determine the overall value and priority in meeting the wider aims of the Department of Transport and the particular needs of local areas, together with the vision and objectives of the NATMAP 2050. Only those interventions/options ranked very strongly should be converted into projects and considered for individual business case development or a feasibility study in securing funding or be discarded.

Table 13-1 below illustrates the common basis assessment matrix.
Detailed option evaluation will be a mixture of qualitative and quantitative analysis. The common basis assessment framework will be used to evaluate and prioritise the options. The purpose of the appraisal framework is to help prioritise and rank a large number of options, to reduce the number and to package them, where possible. The process of appraisal is qualitative – judgement is passed over the effect/impact of the options in terms of achieving transport objectives.

The common basis assessment framework has the following components and/or input requirements:

- High-level transport criteria – provide association with development objectives
- Descriptive criteria – describe and give more meaning to the high-level criteria
- Measurement criteria – measure the impact of an option on a development objective
- Indicators – provide direction to the measurement i.e. positive or negative, or numerically, a great deal (80%) or not a lot (20%)
- Cost/asset attribute – shows whether the measurement criteria and indicators are cost or benefits or assets
- Unit – this attribute (e.g. +++ or %) reflects the numerical scale by means of which the actual measurement/score is described, e.g. the impact of option X on the economic development objective measured in terms of journey time reduction (as a measurement criterion) is 50% or (++).
- Weights – are assigned to measurement criteria and indicators to differentiate their relative importance – because the appraiser may consider some measurement criteria to be more important than others.
  - There are two types of weights, Weight Niveau 1, and Weight Niveau 2.
  - Weight Niveau 1 is a weight assigned to each measurement criterion, whereas Weight Niveau 2 is a weight assigned to each indicator.

- The sum of the weights assigned to each Weight Niveau 1 equals 1.00 and the weights assigned to Weight Niveau 2 also equates to 1.00.
- The weights are manually assigned by the appraiser – the appraiser makes a judgement.

Interventions or options – are the interventions identified to address the needs or problems.

In evaluating and scoring the interventions/options, their impact on the development objectives are assessed, measured in terms of the criteria and indicators. Weights need to be assigned to each of the measurement criteria to reflect that some high-level criteria may be more important than others (or they may all be weighted equally).

Scoring the options is the product of asking the following question:

“To what extent does the option support the transport objectives measured in terms of the X criterion and indicators?”

Scoring could use a ratio scale – nominal, interval, ordinal, etc. For example, where the ratio scale is applied, ask the question (Screening 1): “To what extent does the option support particular objectives in terms of the measurement criteria and indicators?” For example, the answer could be either 70%, or, if a ---/+++ scale is used, ++ (suggesting the projects/options contribute quite a lot to achieving the objectives).

Because it is difficult to decide which projects/options are more important than others if many projects/options are evaluated, a suitable software programme could be used.

The result of the option selection process p (see Figure 13-1) is interventions or options scored and ranked in terms of meeting overall transport objectives and priority. Following this process, some stakeholders may feel that some interventions/options should be more important than others and could be scored/ranked differently. If this occurs, sensitivity testing should be undertaken either by using suitable software or, for smaller scale option selection processes, by manually adjusting the weights and scores assigned.

Once the ranking of projects or options is concluded, the outcome of the process needs to be reported to the NTF or local partnership. In turn, application will be made for funding, which may, in turn, require additional analysis in the form of individual business case development. Once these steps have been concluded, the project nears implementation in the form of detail design or some other form of implementation.
## COMMON BASIS ASSESSMENT FRAMEWORK

<table>
<thead>
<tr>
<th>HIGH-LEVEL APPRAISAL CRITERIA</th>
<th>Appraisal criteria descriptor</th>
<th>Measurement criteria</th>
<th>Indicators</th>
<th>Cost/asset</th>
<th>Unit</th>
<th>Unit</th>
<th>STRATEGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Transport economic efficiency: Consumers</td>
<td>Reduction in journey time</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improvement of train frequencies</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Journey ambience</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reliability/punctuality</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport economic efficiency: Business users &amp; transport providers</td>
<td>Capital cost</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Operating cost</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Revenue</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public accounts</td>
<td>Cost to public sector</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Scope to lever private finance</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wider economic effects/impacts</td>
<td>Benefit cost ratio/cost coverage ratio</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Environmental</td>
<td>Air quality</td>
<td>Change in traffic flow</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regional and wider air quality</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green house gas</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>Local/regional noise pollution</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change in traffic flow</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape &amp; biodiversity</td>
<td>Change in landscape &amp; biodiversity</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Heritage of historic resources</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical fitness</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water environment</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access/inclusion</td>
<td>Access to the transport system</td>
<td>Personal affordability</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduction in barriers (enhanced access to transport services)</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons of reduced mobility (e.g. paraplegic)</td>
<td>Settlement severance</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety &amp; well-being</td>
<td>Accidents</td>
<td>Change in accidents</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduced risk associated with travelling</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration</td>
<td>Land use policy</td>
<td>Contribution to transport land use integration</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connection with other public transport modes</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supportive of other relevant government policies</td>
<td>LN - LP</td>
<td>C / A</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13.4 Outline Guidance for Transport Investment

Where the common basis assessment framework identified a prioritised list of interventions that are worthy of further examination and development, the outline guidance for transport investment provides a framework for additional development options for intervention into projects for future implementation. The focus is on appraising the affordability, value for money and deliverability of interventions to determine if they have a sufficient business case to be taken forward for implementation.

The guidance is intended to complement and not to replace existing DoT processes and reflect the medium-term expenditure framework capital planning guidelines (Department of National Treasury, 2012 & 2013). The guidance provided is broadly aligned with the feasibility study requirements for PPP projects as required by National Treasury (under Regulation 16).¹

The guidance is an outline, requires further detailed work and is an extension of the proposals outlined in Chapter 10.

The outline guidance for transport investment focuses on a four-staged approach, as illustrated in Figure 13-2:

1) Confirming the strategic case
2) Appraising the impact and the cost-benefit analysis of the project (in both financial and wider economic terms)
3) Identifying the preferred project delivery model (also see Chapter 10) and broad implementation and procurement strategy

¹ The outline guidance for transport investment has been informed by the gateway project review process developed by the Office of Government Commerce (OGC) in the United Kingdom and introduced across Central Civil Government as part of its modernisation agenda to support the delivery of improved public services in 2001 (United Kingdom, 2007). The gateway review process is a series of short, focused, independent peer reviews at key stages of a project or programme. The reviews highlight risks and issues that, if not addressed, will threaten successful delivery.
4) Considering whether the project is deliverable in terms of how it will be funded (affordability) and implemented.

In using this approach, some important enabling steps should be taken:

- Clear gateway reviews at the end of each stage to inform the eventual decision as to whether or not a business case exists to implement the intervention.
- Appointment of one responsible official to champion or sponsor the development of the business case.
- In some instances, particularly when the intervention is of a sufficiently large scale, a representative or small project working group should be established to deal with emerging technical or appraisal issues. This should comprise relevant representatives from across departments.

The outline guidance for transport investment can be adopted to track through these four stages. It is important to note that this is purely a typical process that can be followed, and the recommendation is that further detailed work be done to elaborate and confirm the process. It is specifically recommended that this process be confirmed with input from the National Treasury and formalised in a guidance document.

13.4.1 Stage 1 – Confirming the strategic case

This stage focuses on confirming that a robust and accepted case for change exists and that it aligns with the transport objectives. A number of steps should be taken in this stage, as described below.

IDENTIFYING THE STRATEGIC CASE

A – Identifying the problem and linking it to the NATMAP 2050 transport objectives – An essential first task is to identify the problem that needs to be addressed and confirm that it is hindering the achievement of the wider transport objectives defined in the NATMAP 2050. For example, poor public transport links might be a problem between cities A and B (either due to journey time or frequency), which could jeopardise the objective of focusing economic development on an important national or provincial corridor.

The starting point must always be to identify the problem and not a project or intervention. Otherwise, it will not be possible to ensure that the case for change is objective-led and there is a risk that projects will be taken forward for the sake of these projects rather than that of meeting objectives. There can only be a strategic case for change if the change addresses the objectives defined in the NATMAP 2050. If the intervention or project was prioritised in the NATMAP 2050, then the strategic case can be considered proven.

B – Identifying possible options for change – The next step is to list potential options for change to overcome the identified problem by asking a couple of questions:

- What is the option's output in terms of changes to, for example, the timetable or the capacity of a particular public transport service?
- What input does the option require? A timetable change? Additional resources (for example, buses, taxis, rolling stock, resources or crew)? An investment in infrastructure change (improvements or additional network capacity)?

C – Sifting options – If the option did not originate from an intervention listed in the NATMAP 2050, then a high-level sifting should be undertaken using the high-level sifting process described in Section 13.3 above to identify which option, or short list of options, should be taken forward. The main purpose of the high-level sifting is to identify and eliminate options that fail to support the transport objectives defined in the NATMAP 2050. The sifting process should consider factors such as:

- Technical: what operational or capacity-enhancing purpose does the investment serve?
- Choices: what alternatives have been considered and why are they inferior?

- Market: what customer constituency does the investment serve?
- Economic: what transport and wider economic needs will be met by the investment?
- Commercial: what revenues will be enhanced and what costs will be reduced/controlled? Are the implementation costs proportionate to the likely commercial and wider benefits?

CHECKLIST SUMMARY

To further strengthen the decision-making process, a checklist summary is developed to ensure that the case for change is objective-led and options or projects are not taken forward for the sake of these projects but rather for that of meeting transport objectives. The following questions must be asked as part of the checklist:

- Has the strategic case been identified? Is there a clear problem or need that would impact on the achievement of one or more of the transport objectives listed in the NATMAP 2050?
- Has a long list of options to address the problem or need been identified and defined?
- Have the options been sifted to a shortlist of one or more?
- Has the process been discussed with relevant stakeholders (e.g., national, provincial or municipal government)?
- Does the project's development have a suitable governance structure?

STRATEGIC CASE GATEWAY REVIEW

The final step in this stage is to establish if the strategic case for the investment to overcome the identified problem has been established and if a set of options has been identified for appraisal. The review should be chaired by an appropriate official who is independent of the project and who will verify
whether the steps above have been taken and followed. If all the steps have not been taken, the option fails the gateway test and does not pass to the next stage but is referred back for further consideration.

13.4.2 Stage 2 – Appraising the impact

Having established the strategic case in Stage 1, the affordability and potential value for money of the option or options now needs to be determined. Appraisal will consider the implementation cost (in capital and operational expenditure) and the benefits that will be delivered financially and in wider economic terms.

APPRAISAL APPROACH AND CONTENT

The appraisal process is an important step in developing a project, irrespective of whether the development involves a timetable change or more significant investment. This process may be accompanied by a feasibility study or appraisal report covering the strategic case (including the objective-led identification of needs and options) and the appraisal. It is not the purpose of this paper to be prescriptive in terms of the type of appraisal used (e.g. benefit costs and other quantitative and qualitative methods); rather, it seeks to define typical components to be considered.

A – Problems and options – The output of Stage 1 will be a list of one or more options for appraisal and development. For each option, it will include the outputs that they are expected to deliver and the inputs required in terms of resources, staff and investment.

Inevitably, some further work will be required to determine more specific needs (e.g. detail) for each option. Much of this information will need to be provided by the relevant authority using either rule of thumb assumptions or the outputs of more detailed analysis. It is important that the official responsible for developing the business case robustly challenge any assumptions. This is to ensure that the proposed changes are caused by the proposed option and are, therefore, relevant to the business case for this option.

It may also be necessary to do more work to define the expected output in more detail to enable the estimation of wider benefits (and, in some instances, the calculation of costs, too). In completing this, it is important to:

- List the assumptions used
- Tabulate them for each option so that the base assumptions that underpin the remaining appraisal work are clearly visible and understood.

B – Capital costs – Capital costs for each option need to be identified. These arise, for example, from the need for additional infrastructure costs. For infrastructure, the origin of capital costs for the appraisal will be dependent on the status of the project:

- If the options are pre-FEL, then the cost can be calculated at a per kilometre level or using the cost of a similar recent intervention. It would be sensible to add some contingency to reflect uncertainties around the design cost (circa 50%).
- If at FEL stages then the costs can be taken from the design. In doing this, it is important that basic questions be asked, such as: Has the project been properly specified (using a user requirements specification)? Parallel engineering feasibility study outputs should be able to assist here.
- It will be important to confirm that the capital costs are relevant to the enhancement. Any other costs that are not relevant to the appraisal, such as renewals costs, should not be included in the appraisal.

C – Operating costs – Operating costs should be detailed, if appropriate. It is important that the assumptions used to estimate them be clear. Operating cost estimates should be prepared for each year across the period of the appraisal.

D – Revenue – Assess the revenue potential of the intervention or project. If considering public transport options, judgement and some pragmatic assumptions will be required for. For example:

- The achievable loadings of any additional or longer-distance service proposed could be informed by demand today on the existing service or on a parallel corridor
- Fares per journey need to be informed by the level of competition from other modes (e.g. relative journey time or fares)
- Suitable growth factors (either local relevant employment growth or local economic growth forecasts)
- Some consideration of demand build up on new or radically altered services over two to three years as passengers adapt their travel behaviour and location (typically 30% to 75% to 100% over three years)
- A clear statement of any assumptions made, particularly for competing modes. These are helpful for sensitivity testing.

E – Wider benefits – The level and scale of the investment will guide the degree to which wider benefits need to be considered. Revenue and costs alone do not reflect the full impact of an investment. Transport improvements also help to:

- Protect and enhance the environment
- Improve safety
- Contribute to an efficient economy, supporting economic development and sustainable economic growth in appropriate locations
- Promote accessibility to everyday facilities for all
- Promote the integration of all forms of transport and land use planning, leading to a better, more efficient transport system.
In the absence of definitive guidance from national government, the following items should be considered. Where possible, these items should be quantified (working closely with stakeholders to access earlier reports where available). Otherwise, the impacts should be described and indicators (such as demand forecasts) used to indicate their magnitude of impact. Building on the public transport example above, items for consideration could include:

- Time and quality benefits to current users from reduced journey (arising from faster and more frequent services) and/or reduced crowding (arising from train lengthening or more frequent services)
- Benefits to users of other public transport systems (where rail might relieve demand growth on parallel networks)
- Benefits to road-based transport from a switch to rail reducing highway congestion and potentially accidents
- The environmental value of the option
- Improvements in accessibility to key nodes; for example, employment centres both in the city centre and at other nodes;
- Improvements to integration
- Wider economic benefits including:
  - Employment creation (construction and operation)
  - The impact of transformational changes (which, if overlooked, can lead to their being rejected on narrow transport economic appraisal grounds) supporting agglomeration by delivering productivity benefits from enabling the concentration of economic activity (through location and the reduction of the cost and time of travel) and enhancing the labour market by creating more employment through improving access to the supply of labour and more productive jobs (thereby increasing incomes).

**F – Completing the appraisal** – To complete the appraisal, the scope and assumptions of the appraisal need to be defined:

- The scope should reconfirm the options being evaluated and also the degree to which the appraisal will be financial or economic, depending on the information available
- The key risks and contingencies that need sensitivity testing – the main assumptions used for calculating the appraisal inputs (costs, revenue and benefits) should be reviewed
- The record of appraisal assumptions, which should include the length of the appraisal (this normally links to asset life but many appraisal approaches use 30 years and this provides a good comparison benchmark), the discount rate to be used and other key inputs.

The appraisal process should answer the following questions:

- Which option delivers the best value for money?
- Is the option affordable in terms of its operating and capital costs?

Results should be presented as follows:

- A benefit–cost ratio (at least the financial ratio) based on the appraisal results discounted over 30 years
- Any funding requirement in terms of both changes to net revenue (revenue–operating costs) from operations and any capital costs – this could be presented annually and in net present value terms
- The impact of adding in the economic benefits where quantifiable on the benefit–cost ratio and supplemented with qualitative analysis, where this is available
- Confirmation that the options are appropriate to the need
- Quantified sensitivity testing of key assumptions, typically significant capital and operating cost items and revenue. This should include changes to the absolute quantities and delays in completing the scheme or achieving forecast revenue
- Conclusions on value for money and likely affordability
- Some indication of key risks from the sensitivity testing and other key indicators, such as the payback period.

**CHECKLIST SUMMARY**

To strengthen the appraisal process, a checklist summary is developed to ensure that the options identified for implementation are robustly defensible and meet clear development objectives. The following questions must be asked as part of the checklist:

- Have the options been fully defined in terms of their outputs and required inputs?
- Has an analysis been completed and robustly challenged?
- Are any capital costs supported by a FEL stage’s outputs or are they very early estimates based on cost drivers or equivalent schemes (with contingency added)?
- Have the appraisal assumptions been identified, included the appraisal term and the dates of key events, such as construction of new infrastructure?
- Are quantities and unit costs available for all capital and operating costs and are all the assumptions behind their calculation documented?
- Have revenue forecasts been prepared and are all the assumptions behind their calculation documented?
- Have any wider benefits been identified and quantified?
- Has a discounted cash flow been prepared?
- Have sensitivity tests been undertaken?
- Have the options with the greatest value for money been identified and have conclusions been drawn?
- Have any funding requirements in terms of operations and construction been identified and are they deemed to be affordable?
APPRAISAL GATEWAY REVIEW

This final step will establish if the value for money case for the investment has been established, is likely to be affordable and does not carry any significant risks that cannot be mitigated. The review should be chaired by a senior official who is independent of the project.

13.4.3 Stage 3 – Delivery model options analysis

Projects may be executed in various ways along a spectrum of pure public to pure private provision. Stage 3 of the process seeks to ensure that a variety of project delivery modalities are explored and that the best option is selected for implementation. The steps to be followed in this regard are broadly aligned with Module 4 of the National Treasury PPP manual.

The proposed process should cover at least the following steps:

STEP 1: LIST ALL THE SOLUTION OPTIONS THE INSTITUTION HAS CONSIDERED

The first step would be to list the possible procurement options that could be considered for the delivery of the project. The list must cover the range of the most viable solution options for providing the specified outputs of the required service.

STEP 2: EVALUATE EACH SOLUTION OPTION

The purpose of the evaluation is to:

- Identify the advantages and disadvantages of each solution option
- Examine the risks and benefits for and potential impacts on the government of each option
- Identify which of the solution options provide the best value for money to the government.

It is suggested that the following basic information for each option be presented (in line with Module 4 Stage 2 of the PPP guidelines):

1) Brief description
2) Financial impacts
3) Funding and affordability
4) Risk
5) BEE and other socio-economic aspects
6) Service delivery arrangements
7) Transitional management issues
8) Technical analysis
9) Site issues
10) Legislation and regulations
11) Human resources
12) Market capability and appetite
13) Qualitative factors.

STEP 3: CHOOSE THE BEST SOLUTION OPTION

Once each solution option has been evaluated, a matrix approach should be used to weigh up the evaluation of each option against the others to assist in the choice of the best one (the list of evaluation items in Step 2). In this last step of the solution options analysis stage, recommendations should be made as to which options should be pursued to the next stage.

13.4.4 Stage 4 – Implementation

This stage confirms that the project is deliverable in terms of how it will be funded, designed, planned and implemented. This completes the development of the business case. In reality, some of the tasks listed below may have been completed in parallel with Stage 2 but this stage provides an opportunity to formally review them.

TASKS/CHECKLIST SUMMARY

The following tasks need to be completed to confirm that the project is deliverable in terms of how it will be funded, designed, planned:

- Identify any funding requirement for the value for money option and from where will it be sourced (internal funding, yearly MTEF or other stakeholders). This should include both the capital cost of implementation and any future increased operating subsidy.
- Confirm that stakeholder engagement has occurred and that there are no issues from key external national or regional stakeholders.
- Confirm that a robust project implementation plan is in place that comprises:
  - project specifications and, at least, outline designs
  - a realistic project timetable and implementation programme
  - an environmental impact assessment has been completed where necessary and any resulting cost incorporated into the business case and any necessary consents identified and a plan developed for achieving them
  - whether the department has the capacity to procure the design and project planning or whether the work needs to be outsourced
  - a named project champion, governance structure and the staff and material resources to implement the project
  - a robust plan for managing and mitigating a set of identified key project risks.

IMPLEMENTATION GATEWAY REVIEW

This step will conclude Stage 3 and establish if the preferred option identified in Stage 2 can be implemented and will mark the completion of the business case for investment. The review should be chaired by a senior official who is independent of the project.
13.5 Measure, Monitor, Evaluate (KPIs)

Of equal importance to delivering the NATMAP 2050 is the need to measure whether the overall vision, objectives and priorities of transport are being achieved. Progress against objectives can be measured using key performance indicators. Applying outcome KPIs will help ensure a balanced view at the national, regional and global levels of the critical role of transport services in reducing poverty, facilitating growth and contributing to the achievement of key development targets and sustainability. An output indicator is defined as a variable that is selected and defined to measure the success towards achieving progress and objectives, whereas a target is defined as a specific, realistic, measurable aim.

Table 13-2 below details KPIs to assess or track progress against national strategic transport objectives aligned to aspirations reflected in the NDP 2030 and the emerging NLTTF. The KPIs and, in particular, the targets defined will require refinement over time and agreement by relevant stakeholders. Over time, the indicators and targets could show whether the interventions and policy directions in transport are successful or not. The tracking of indicators will be executed by data collection through the establishment of the national multimodal transport data bank proposed earlier in this report.

Monitoring and measuring the KPIs and targets will be a cross-sectoral undertaking and will require cross-sectoral implementation.

A measure of the success with which an integrated and efficient transport system is achieved is the level of certainty about completing journeys in the planned time. Journey time variability is something that is not measured on all modes of transport at present. Consideration will be given as to how to achieve this. The DoT will be developing and evaluating a number of different techniques for measuring journey time and travel journey time variability on strategic roads/trunk routes in metropolitan areas. This information and the information available on rail journey time variability will be used to establish a baseline for long-distance road and rail journeys. The information will also be used to monitor progress against suitable measures and targets.

Another important aim is to reduce car dependence. This is particularly relevant when roads are at their busiest. When a greater proportion of those travelling to work and higher education establishments are persuaded to travel by means other than by car, for example by public transport, cycling or walking, it will improve the environment and people’s health and enable those who have to use the roads to do so with greater efficiency. The aim is that by 2020 about 70% of commuting to work trips will take place by means other than by car. Progress will be measured through the National Household Survey. Techniques will be developed to monitor how younger children travel to school to encourage the habit of using a sustainable means of transport at an early age.

Road and rail safety is an important issue in terms of people’s health, the burden on health services and the ability to contribute economically and culturally to society as consisting of individuals. Accidents also cause major disruption to the efficient operation of the transport system. The number of road accidents, particularly ones involving children and pedestrians, is far too high. The aim is to achieve by 2025:

- 50% reduction in the number of people killed or seriously injured in road and rail accidents
- 10% reduction in fatalities year on year.

The provision and use of public transport is increasingly important. A target is to achieve a one-third increase in the proportion of households in rural areas within about 10 minutes’ walk of an hourly bus service by 2020. Whilst scheduled stopping bus services and the MBT industry will play an important role in meeting the need for public transport, other means, such as more flexible forms of transport, including community schemes, flexibly routed buses and subsidised taxi schemes, can, in many instances, provide a more effective service, particularly in rural areas. Accessibility to transport services is an important aim of the NATMAP 2050 and it is important that an indicator and target that are truly representative and achievable be chosen. By 2020, a representative accessibility target for non-private forms of transport appropriate for South Africa will, therefore, be developed. This work will build on the work being carried out by other government departments in their review of public transport.

Progress will be reported annually, where possible, and the use of indicators in a full review every 5 years.
<table>
<thead>
<tr>
<th>TRANSPORT THEMES</th>
<th>KPI</th>
<th>MEASUREMENT</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated transport planning</td>
<td>Journey time to work (door-to-door) by all modes</td>
<td>Travel time in minutes</td>
<td>&lt; hour (urban) / &lt; 30min (rural)</td>
</tr>
<tr>
<td></td>
<td>Rate of use of urban land</td>
<td>Per capita land use – m² of land used/resident</td>
<td>% densification (urban areas)</td>
</tr>
<tr>
<td></td>
<td>Traffic network performance</td>
<td>Average peak-period journey speed (km/h), traffic flow rate, queue lengths, relative to a target journey speed (km/hr)</td>
<td>LOS D in peak hour traffic (urban)</td>
</tr>
<tr>
<td></td>
<td>Densification of corridors and transit-orientated developments (increase in GLA and/or housing units) that are spatially, socially and economically integrated</td>
<td>GLA and/or housing units</td>
<td>LOS B in peak hour traffic (rural)</td>
</tr>
<tr>
<td></td>
<td>Quality walking links to main public transport nodes in 20min or 1km radii</td>
<td>km</td>
<td>km of NMT network created</td>
</tr>
<tr>
<td></td>
<td>Increase commuting to work trips by public transport and walking</td>
<td>%</td>
<td>1% cycling mode share in work trips by 2020</td>
</tr>
<tr>
<td></td>
<td>Full cycle lane within a radius of 5km from main PT nodes</td>
<td>km</td>
<td>km of NMT network created</td>
</tr>
<tr>
<td>Public transport</td>
<td>Increase in proportion of households in rural areas within about 2km of a public transport service</td>
<td>% of households</td>
<td>40% by 2020</td>
</tr>
<tr>
<td></td>
<td>Proportion of households in urban areas within 1km walking distance from an IRPTN service</td>
<td>% of households</td>
<td>85% by 2020</td>
</tr>
<tr>
<td></td>
<td>Increase commuting to work trips by public transport</td>
<td>% modal share of road based travel (mode split)</td>
<td>70% by 2020</td>
</tr>
<tr>
<td></td>
<td>Existing service pattern</td>
<td>Frequency</td>
<td>Every 10 min during peak hour on trunk roads and rail and every 20–30 min during off-peak by 2020</td>
</tr>
<tr>
<td></td>
<td>16 to 24 hr services, supporting hybrid service structure incorporating elements of both trunk-feeder services and direct services</td>
<td>Frequency</td>
<td>Every 5 min during peak hour on trunk roads and rail and every 10–30 min during off-peak by 2050</td>
</tr>
<tr>
<td></td>
<td>Reliability of scheduled services</td>
<td>%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Implementation of approved plans and initiatives (e.g. IRPTNs)</td>
<td>% increase in the use of public transport</td>
<td>3% increase in passenger trips per mode per annum to 2020</td>
</tr>
<tr>
<td></td>
<td>Contract, operational requirements and performance specifications developed for scholar transport service providers</td>
<td>Performance specification</td>
<td>Implemented in all provinces by 2020</td>
</tr>
</tbody>
</table>
## TRANSPORT THEMES

<table>
<thead>
<tr>
<th>Environment</th>
<th>Freight transport</th>
<th>Infrastructure (roads and rail)</th>
<th>Road safety</th>
<th>Rural transport</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI</strong></td>
<td><strong>KPI</strong></td>
<td><strong>KPI</strong></td>
<td><strong>KPI</strong></td>
<td><strong>KPI</strong></td>
</tr>
<tr>
<td>Greenhouse gas emissions from all road-based transport</td>
<td>Reduction in overloading by enforcing limits on gross vehicle mass</td>
<td>Preservation of national, provincial and local road infrastructure</td>
<td>Reduction in the number of crashes expressed as the number of people per 100 million vehicle kilometres</td>
<td>Improve rural access index to rural population having access to some form of transport</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>Improve heavy goods vehicle safety performance, roadworthiness, and self-regulation</td>
<td></td>
<td></td>
<td>Rural access improved to eliminate constraints on the time which all children have to participate in education</td>
</tr>
<tr>
<td>Environmental education</td>
<td></td>
<td></td>
<td></td>
<td>Public transport in rural areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MEASUREMENT</strong></th>
<th><strong>TARGET</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total GHG emission (Mt)</td>
<td>Reduce GHG emissions by 5% from current levels by 2025</td>
</tr>
<tr>
<td>% improvement</td>
<td>12% by 2015</td>
</tr>
<tr>
<td>Number of environmental awareness activities conducted</td>
<td>8 per annum (linked to environmental calendar days)</td>
</tr>
<tr>
<td>%</td>
<td>Reduce average number of overloaded trucks on provincial and national roads by x%</td>
</tr>
<tr>
<td>Thousands of 2-lane-kilometers</td>
<td>Improve by X% from “fair” or “good” by 2020.</td>
</tr>
<tr>
<td>Thousands of 2-lane-kilometers</td>
<td>Reduce road surface with very poor condition by 5% in 2025</td>
</tr>
<tr>
<td>Total fatalities and injuries per 100 000km</td>
<td>50% reduction in the number of people killed or seriously injured in road accidents by 2025</td>
</tr>
<tr>
<td>Transport accessibility</td>
<td>Improve rural accessibility to 50% by 2025</td>
</tr>
<tr>
<td>%</td>
<td>% of schools with reliable access</td>
</tr>
<tr>
<td>% of district municipalities implementing the integrated public transport network strategy</td>
<td>Improve public transport in rural areas by 40% by 2019 against plan</td>
</tr>
</tbody>
</table>

### TABLE 13-2: KEY PERFORMANCE INDICATORS (IMPACT OR OUTCOME INDICATORS) - **Continued**
13.6 Focus on Delivery and Implementation of the NATMAP 2050

Implementing the interventions and projects defined in the NATMAP 2050 is very important and, therefore, needs specific attention. It is the primary role of the DoT to ensure the delivery of the NATMAP 2050 with support from its partners when appropriate. The NATMAP 2050 is not a plan that has defined funded projects for delivery. It is the translation of the vision, objectives and priorities in transport into interventions to bring about a sustainable transport system by assessing a wide range of projects with a variety of vertical and horizontal stakeholder implications. Essentially, everyone who has a part to play needs to make complementary and coordinated decisions when formulating and delivering their transport interventions and projects. The implication, therefore, is that those who deliver transport infrastructure and services to do so within the context of this plan.

In addition to providing the leadership necessary to achieve the vision, objectives and priorities defined, the DoT has a direct role in supporting the delivery of strategic infrastructure and services.

A very important part of the transport system is administered and delivered by the agencies and municipalities. The plan aims to reflect the role of local authorities in meeting provincial and national needs but it does not aim to identify or prescribe in detail how they should achieve this goal.

The plan recommends the establishment of a National Transport Forum, along with local partnerships, to strengthen decision-making in land use and transport planning as well as working in a more integrated manner. This will overcome, amongst other things, issues of skill transfer and the absence of dedicated staff.

Collaboration between several other important authorities and other government departments, including the Departments of Rural Development & Land Reform, Planning, Monitoring and Evaluation, Human Settlements, Trade and Industry, and Economic Development and the National Planning Commission, is also essential.

The DoT, through the utilisation of the National Transport Forum and local partnerships, will provide technical support to all subordinate levels of government in relation to land use and transport planning. At an operational level, Figure 13-3 provides an example how to use the NATMAP 2050 in delivering interventions and projects. It is important to note that the steps highlighted in blue are the steps taken within the NATMAP 2050 process, whilst the remaining steps are ones that follow the NATMAP 2050’s development. The figure also reflects alignment with the front-end loading process (FEL – 1 to 4).

Figure 13-3 highlights the following steps in the decision-making process typically recommended in finding solutions to problems:

1) Define the needs, objectives and strategic case that confirm an issue has to be addressed
2) Identify the preferred intervention
3) Apply the common basis assessment framework to prioritise interventions/options in meeting transport objectives
4) Select the highest-ranking options/interventions to be scrutinised in terms of the guidance on transport investment
5) Undertake individual business cases for each intervention selected using an appropriate delivery model
6) Apply for funding via the National Transport Forum/local partnership or appropriate funding agency
7) Secure funding
8) Implement project
9) Measure the successes of the project
10) Monitor and review.

It is important to note that the framework for using the NATMAP 2050 outlined above serves as a guide to decision-making. There are no hard and fast rules when it comes to prioritisation. It is, however, important to adopt the logic presented by the framework to ensure that the starting point is always the identification of the problem and not a project or intervention. Otherwise, it will not be possible to ensure that the case for change is objective-led and there is a risk that projects are taken forward for the sake of these projects rather than for that of meeting objectives.
FIGURE 13-3: FRAMEWORK FOR USING NATMAP 2050
13.7 Demonstrating Integration and Alignment

The framework for using the NATMAP 2050 described above provides a useful guide to support decision-making. It is also an extremely useful supporting integration and alignment tool to a variety of interventions and/or projects across different sectors. Whilst there are no hard and fast rules, this section demonstrates the real life application of the framework. In transport and land use, we often find misalignment in the planning and delivery of infrastructure and in policies and services, which results in adverse impacts on the economy and road users. By adopting the framework described above, it is possible to reduce these negative outcomes.

This sub-section demonstrates the application of the framework and the option selection process. It demonstrates how the NATMAP 2050 should be used to create alignment, integration and coordination between selected strategic integrated projects (SIPs), and other sectors. It will show how the NATMAP 2050 bridges the gap between disjointed planning and implementation practices, leaving a transport system that fully supports cross-sectoral initiatives and projects.

### 13.7.1 Integration and alignment defined

There are many different interpretations and meanings attached to the alignment and an integrated approach in transportation, land use and built environment planning and delivery. A general description of the approach is a process by means of which people from different backgrounds, from different parts of government, and at all levels, are engaged to find the alternative development solution or alternative with the highest collective socio-economic impact at optimum cost. Integration, therefore, has to occur on all levels – vertical integration, and across all disciplines – horizontal integration, when projects are planned and delivered (illustrated in Figure 13-4).
**Vertical integration:**
- Vertical integration is about bringing policies, vision and intent from different levels of government together to provide a vision and to ensure that projects align and are integrated from national to local levels.
- To this end, the vision provided in the NATMAP 2050 for transport in South Africa guides the development of solutions and technology, which, in turn, are implemented by provinces and local authorities.
- However, a bottom-up approach is also required to adapt the vision and strategy based on changes in the local context. During the development of the NATMAP 2050, both the bottom-up and top-down approaches were followed to develop the vision and strategies. These need to be revised periodically to ensure that the vision aligns with changes on the ground.

**Horizontal integration:**
- Horizontal integration is about organising and coordinating disciplines required to deliver a specific project or projects in a specific area and normally refers to all the actors or service delivery agents operating at that level, even if some of them may be the delivery function of at national, provincial or district level.

### 13.7.2 Integration and alignment applied
Integration and alignment need to occur at national, provincial and local level. To demonstrate alignment on national, provincial, and local level, a concise description of the national projects for SIP 1, 2, 3 and 5 are provided and, subsequently, projects within in SIP 1, 2 and 3 are detailed at both provincial and local level through the application of the option selection process.

### 13.7.3 National integration
The government adopted a national infrastructure plan in 2012 that intends to transform our economic landscape while simultaneously creating significant numbers of new jobs, and to strengthen the delivery of basic services. The plan also supports the integration of African economies.

The NATMAP 2050 supports the implementation of the 18 strategic integrated projects (SIPs) in the NIP and NDP through its various transport interventions.

The following maps reflect, at national level, an integrated view of NATMAP 2050, NIP, NDP, Department of Human Settlements, DPE and DTI projects as they relate to the five catalytic geographically focused SIPs.
SIP 1: UNLOCKING THE NORTHERN MINERAL BELT WITH WATERBERG AS CATALYST

SIP 1 will unlock the economic development potential of the rich mineral resources in the northern mineral belt around Waterberg/Lephalale. Urban development in Waterberg will be the first major post-apartheid new urban centre and will be a green development project. Shifting coal from road to rail in Mpumalanga and upgrading the rail capacity from Waterberg to Mpumalanga and Richards Bay will be key transport enablers.

### TABLE 13-3: NATMAP 2050 AND OTHER PROJECTS RELATED TO SIP 1

<table>
<thead>
<tr>
<th>PROJECT CATEGORY</th>
<th>MAP REF NO</th>
<th>PROJECT NAMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATMAP 2050 road projects</td>
<td>56</td>
<td>Pongola and eDumbe Road upgrade</td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>Richards Bay–Melmoth new heavy-haul road</td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>Mpumalanga coal haulage roads upgrade</td>
</tr>
<tr>
<td></td>
<td>69</td>
<td>Limpopo coal haulage roads upgrade</td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>Maloto Road upgrade</td>
</tr>
<tr>
<td>NATMAP 2050 rail freight projects</td>
<td>73</td>
<td>Matlatbas–Vaalwater–Modimolle new rail link</td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>South Africa–Swaziland new rail link</td>
</tr>
<tr>
<td></td>
<td>72</td>
<td>Ermelo–Richards Bay rail upgrade</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>Lephalale–Botswana new rail link</td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>Waterberg–Mpumalanga–Richards Bay export coal line expansion</td>
</tr>
<tr>
<td>NATMAP 2050 passenger rail projects</td>
<td>31</td>
<td>Tshwane–Mbombela passenger rail</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>eMalahleni &amp; Steve Tshwete passenger link with Maloto Rail corridor &amp; Gautrain</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>Maloto passenger rail</td>
</tr>
<tr>
<td>NATMAP 2050 port projects</td>
<td>18</td>
<td>Port of Richards Bay expansion</td>
</tr>
<tr>
<td>NATMAP 2050 airport projects</td>
<td>7</td>
<td>Richards Bay Airport upgrade</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Polokwane aerotropolis</td>
</tr>
<tr>
<td>NATMAP 2050 freight projects</td>
<td>116</td>
<td>Richards Bay SEZ</td>
</tr>
<tr>
<td>Municipal infrastructure projects (SIP6)</td>
<td>154</td>
<td>Amajuba District</td>
</tr>
<tr>
<td></td>
<td>158</td>
<td>Umkhanyakude District</td>
</tr>
<tr>
<td></td>
<td>159</td>
<td>Umzinyathi District</td>
</tr>
<tr>
<td></td>
<td>161</td>
<td>Uthungulu District</td>
</tr>
<tr>
<td></td>
<td>162</td>
<td>Zululand District</td>
</tr>
<tr>
<td></td>
<td>163</td>
<td>Capricorn District</td>
</tr>
<tr>
<td></td>
<td>164</td>
<td>Greater Sekhukhune District</td>
</tr>
<tr>
<td>Department of Human Settlements projects</td>
<td>143</td>
<td>Lephalale Housing</td>
</tr>
<tr>
<td></td>
<td>144</td>
<td>Mining towns – Thabazimbi &amp; Greater Tubatse (LP ), Emalahleni, Steve Tshwete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&amp; Thaba Chweu (MP)</td>
</tr>
<tr>
<td>Agri-logistics projects (SIP11)</td>
<td>184</td>
<td>One-stop shop fruit handling facility</td>
</tr>
<tr>
<td></td>
<td>191</td>
<td>Mbazwane forest rehabilitation</td>
</tr>
<tr>
<td></td>
<td>193</td>
<td>Makhathini development program</td>
</tr>
<tr>
<td></td>
<td>197</td>
<td>Rehabilitation of agricultural colleges</td>
</tr>
<tr>
<td></td>
<td>198</td>
<td>Project Rebirth</td>
</tr>
</tbody>
</table>
FIGURE 13-5: NATMAP 2050 AND OTHER PROJECTS RELATED TO SIP 1 (Source: Various)
SIP 2: DURBAN–FREE STATE–GAUTENG LOGISTICS AND INDUSTRIAL CORRIDOR

SIP 2 builds on the eminence of the Durban port as the largest freight and logistics gateway to the African continent. It will strengthen the logistics and transport corridor between South Africa’s main industrial hubs (Gauteng and Durban) by improving access to Durban’s export and import facilities, integrating the Free State industrial strategy activities into the corridor, upgrading the Durban port, upgrading road, rail and pipeline infrastructure and developing an aerotropolis around the OR Tambo International Airport.

<table>
<thead>
<tr>
<th>PROJECT CATEGORY</th>
<th>MAP REF NO</th>
<th>PROJECT NAMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATMAP 2050 road projects</td>
<td>59</td>
<td>Construction of PWV9 road</td>
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<tr>
<td></td>
<td>61</td>
<td>Various road upgrades in Gauteng</td>
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<td></td>
<td>64</td>
<td>N3 Durban–Pietermaritzburg upgrade</td>
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<td></td>
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<td>N3TC road rehabilitation of sections</td>
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<td></td>
<td>62</td>
<td>N2 Cato Ridge new heavy-haul road</td>
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<tr>
<td></td>
<td>48</td>
<td>N3 De Beer’s Pass</td>
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<td>Gauteng–Durban new rail line</td>
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<td>Gauteng–Durban high-speed passenger rail</td>
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<td>New multi-products pipeline (NMPP)</td>
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<td>Multimodal facility at Jameson Park</td>
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<td>NATMAP 2050 airport projects</td>
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<tr>
<td></td>
<td>2</td>
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<td></td>
<td>5</td>
<td>OR Tambo International Airport Expansion</td>
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<td></td>
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<td>Cato Ridge dry port</td>
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<td>City Deep terminal expansion</td>
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<td>Pyramid mega intermodal logistics terminal</td>
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<td>Harrismith intermodal logistics terminal</td>
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<td>Amajuba District</td>
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<td>Umzinyathi District</td>
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<td>Integrated transport projects (SIP7)</td>
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<td>Rea Vaya integrated rapid transport system</td>
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<td>eThekwini integrated rapid transport system</td>
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<td>Tshwane integrated rapid transport system</td>
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<td>Msunduzi integrated rapid transport system</td>
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<td>184</td>
<td>One-stop shop fruit handling facility</td>
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<td>198</td>
<td>Project Rebirth</td>
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<tr>
<td></td>
<td>176</td>
<td>Standerton soya crushing plant</td>
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<tr>
<td></td>
<td>179</td>
<td>National red meat development project</td>
</tr>
</tbody>
</table>
FIGURE 13-6: NATMAP 2050 AND OTHER PROJECTS RELATED TO SIP 2 (Source: Various)
SIP 3: SOUTH-EASTERN NODE AND CORRIDOR DEVELOPMENT

SIP 3 is geared to unlock the gateway potential of the Ports of Ngqura and Port Elizabeth and their coastal and inland corridor linkages. It will radically increase the capacity of the rail corridor to the rich manganese deposits in the Northern Cape. The manganese sinter (in the Northern Cape) and manganese smelter (in the Eastern Cape) will realise the economic benefits of industrialisation through mineral beneficiation.

The N2 Wild Coast Highway will improve access to KwaZulu-Natal and national supply chains.

The development of a trans-shipment hub at Ngqura and the associated port and rail upgrades will improve the industrial capacity and performance of the strong automotive sector.

The Mthombo oil refinery and the Ngqura–Gauteng pipeline will position this node as an alternative energy provider for the industrial heartland of Gauteng.

<table>
<thead>
<tr>
<th>PROJECT CATEGORY</th>
<th>MAP REF NO</th>
<th>PROJECT NAMES</th>
</tr>
</thead>
<tbody>
<tr>
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<td>N2 Wildcoast road upgrade</td>
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<td>NATMAP 2050 rail freight projects</td>
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<td>Manganese rail line expansion</td>
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<tr>
<td>NATMAP 2050 pipeline projects</td>
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<td>Mthombo oil refinery</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Ngqura–Gauteng pipeline</td>
</tr>
<tr>
<td>NATMAP 2050 port projects</td>
<td>21</td>
<td>Port of Ngqura expansion</td>
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<td>NATMAP 2050 airport projects</td>
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<td>Kimberley Airport upgrade</td>
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<td>13</td>
<td>PE Airport expansion to Code D</td>
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<tr>
<td>NATMAP 2050 freight projects</td>
<td>105</td>
<td>Manganese export line</td>
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<tr>
<td></td>
<td>115</td>
<td>Coega SEZ</td>
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<tr>
<td>Municipal infrastructure projects (SIP6)</td>
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<td>Amathole District</td>
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<td>Chris Hani District</td>
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<td>152</td>
<td>Joe Gqabi District</td>
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<td></td>
<td>169</td>
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<td></td>
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<td>Xhariep District</td>
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<td>Manufacturing projects (SIP3)</td>
<td>200</td>
<td>Manganese sinter (Northern Cape)</td>
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<td>201</td>
<td>Manganese smelter (Eastern Cape)</td>
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<tr>
<td>Department of Human Settlements projects</td>
<td>38</td>
<td>Nelson Mandela Bay integrated rapid transport system</td>
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<td>Agri-logistics projects (SIP11)</td>
<td>198</td>
<td>Project Rebirth</td>
</tr>
<tr>
<td></td>
<td>179</td>
<td>National red meat development project</td>
</tr>
<tr>
<td></td>
<td>173</td>
<td>Vaalhart vitrus project</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>Cape malting</td>
</tr>
<tr>
<td></td>
<td>181</td>
<td>Northern Cape vineyard development scheme</td>
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<tr>
<td></td>
<td>182</td>
<td>Sunday’s River lemon oil processing plant</td>
</tr>
<tr>
<td></td>
<td>192</td>
<td>Vaalhart–Taung irrigation scheme</td>
</tr>
</tbody>
</table>
FIGURE 13-7: NATMAP 2050 AND OTHER PROJECTS RELATED TO SIP 3 (Source: Various)
SIP 5: SALDANHA–NORTHERN CAPE DEVELOPMENT CORRIDOR

SIP 5 capitalises on the rich iron ore reserves in the Northern Cape to further strengthen the Saldanha port’s economic potential. An integrated rail and port expansion programme, together with back-of-port industrial capacity (including an SEZ) and the expansion of iron ore mining production and beneficiation, will increase Saldanha’s eminence.

A strategic focus for Saldanha is to offer maritime support capacity for oil and gas industries along the western coast of Africa.

<table>
<thead>
<tr>
<th>PROJECT CATEGORY</th>
<th>MAP REF NO</th>
<th>PROJECT NAMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATMAP 2050 road projects</td>
<td>51</td>
<td>Road to Clanwilliam</td>
</tr>
<tr>
<td>NATMAP 2050 rail freight projects</td>
<td>75</td>
<td>Sishen–Saldanha rail upgrade</td>
</tr>
<tr>
<td>NATMAP 2050 port projects</td>
<td>20</td>
<td>Port of Saldanha expansion</td>
</tr>
<tr>
<td>NATMAP 2050 freight projects</td>
<td>112</td>
<td>Saldanha SEZ</td>
</tr>
<tr>
<td>Municipal infrastructure projects (SIP6)</td>
<td>169</td>
<td>John Taolo Gaetsewe District</td>
</tr>
<tr>
<td>Agri-logistics projects (SIP11)</td>
<td>179</td>
<td>National red meat development project</td>
</tr>
</tbody>
</table>
FIGURE 13-8: NATMAP 2050 AND OTHER PROJECTS RELATED TO SIP 5 (Source: Various)
13.7.4 Provincial and local integration

The purpose of this section is to present the three project case studies and to evaluate and propose alternatives based on the option selection process identified by the NATMAP 2050.

The project case studies are:
- SIP 1 – Moloto corridor (PRASA)
- SIP 2 – Harrismith development node (SEZ) and Cornubia (national housing development)
- SIP 3 – N2 Wild Coast development corridor and Port Elizabeth–Coega (housing development agency HDA and SEZ)

The approach has been adopted based on the three steps proposed in the NATMAP 2050 option selection process methodology presented in Section 13.3 above:
- Defining the needs and objectives
- Identifying the preferred intervention
- Prioritisation

The aim of the case studies is not to prioritise the interventions and selection of the optimum delivery mechanism (as this process has already been concluded outside of the NATMAP 2050 process); rather, it is to use the option selection process to select alternatives/interventions to fill planning and implementation gaps based on the issues and challenges identified and to determine if the process promotes integration between projects and initiatives at national, provincial or local level. Emphasis is placed on integration to enhance the impact of the projects through collective investment across different disciplines – thus, double the impact with less effort and capital investment in a specific area. The sub-sections below describe the case study approach in terms of the following attributes examined:

**PROJECT CONTEXT, CHALLENGES AND ISSUES**

A starting point in the process is the gathering of information relating to housing and economic development and transport and bulk service projects that take place within a specified project (SIP) area or link to the node under evaluation. The information collected also reveals who the responsible implementing agent is. This data, in conjunction with that provided in Chapter 6, was used as a departure point for a national and provincial perspective on each case study.

However, for the purposes of metropolitan/district and local details of the selected case studies, alternative data sources were required to provide the details required for analysis. The detailed information required included, for example, the number of housing units, the total area reserved for economic/industrial development, the bulk service infrastructure required, transport projects (e.g. road, rail, public transport, pedestrian), social amenities and educational institutions.

The NATMAP 2050 provides outline guidance on these local plans and forms part of the Phase 1 and Phase 2 reports developed as part of the NATMAP 2050. However, several of these plans were recently updated. The plans available in the public domain were, therefore, used as input to develop the context, challenges and issues for each project.

**FIGURE 13-9: THE NATMAP 2050 ANALYTICAL CASE STUDY APPROACH**
GENERATE OPTIONS/ALTERNATIVES

After the evaluation and identification of gaps, alternative mitigating measures need to be developed to mitigate these gaps. The thought processes applied during the development of these alternatives are to:

- Identify the infrastructure, services and amenities required to provide sustainable transport connectivity and mobility
- Consider feedback implications if projects are not (transport) integrated
- Identify issues that may arise if there is no connectivity, mobility or other components and services
- Identify new interventions to fill gaps.

Where new interventions are required, define alternative interventions in terms of:

- Transport mobility and connectivity. Propose appropriate transport modes using technology choice framework and road network expansion (capacity and road network extent).
- Alternative locality for housing and economic development in relation to each other
- Bulk services requirements to ensure integrated and sustainable development. Provide alternatives to consider what would happen if people are relocated or economic development is brought closer; and whether the bulk infrastructure cost is too high or acceptable.

APPRAISE ALTERNATIVES

The appraisal of alternatives needs to consider the full life cycle needs of a project or community. Thus, some actions can assist in alleviating the severity of the issue or challenge in the short term but, in the long term, other mitigating measures may be required to ensure sustainable and integrated development. For this purpose, alternatives examined need to be compared in respect of their short-medium- or long-term framework.

The impact of collective expenditure across sectors in a specific area that happens in a coordinated manner will show results in the short, medium and long term. The identification of where these areas are and of where a critical component is missing to unlock these areas needs to be highlighted during the prioritisation process.

The outline to present, describe and illustrate the level of alignment and integration for the case studies is:

- Project description and locality
- Project challenges and constraints
- Intervention options and alternatives
- Integration assessment
- Alternatives proposed.
13.7.5 Case study 1: SIP 1 – Moloto passenger corridor

The Moloto development corridor forms part of SIP 1 – unlocking the northern mineral belt with Waterberg as catalyst. The Moloto passenger corridor in relation to other SIP 1 and NATMAP 2050 infrastructure projects is illustrated in Figure 13-10.

The main focus of this initiative is to improve road safety along the Moloto Road, to improve the existing bus service on the road and to introduce a potential rail commuter system aimed at improving regional connectivity (link with the proposed Dilokong corridor, Limpopo) and the mobility of commuters on the corridor. The Moloto proposal is aimed at:

- Reducing the high road accident rate along the Moloto Road
- Improving mobility options to commuters between Moloto and Tshwane
- Reducing overall journey times along the corridor
- Improving access to employment opportunities
- Addressing the backlog of basic municipal service provision for communities within the corridor.

PROJECT CHALLENGES AND ISSUES

The main issues and challenges related to the planning and implementation of the corridor enhancement are:

- Dispersed population
- Limited employment opportunities within the corridor
- High cost associated with relocating residents closer to work opportunities, leading to long travel times and a resistance to relocate closer to work and other social infrastructure
- The corridor is known for a high road accident rate involving public transport vehicles

The results of the integration assessment for the Moloto corridor are shown in Table 13-7.

<table>
<thead>
<tr>
<th>Table 13-7</th>
<th>SIP 1 – MOLOTO CORRIDOR – INTEGRATION ASSESSMENT RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cross-sectoral</strong></td>
<td><strong>Transport system</strong></td>
</tr>
<tr>
<td>Housing</td>
<td>Road</td>
</tr>
<tr>
<td>Economic, industrial, SEZ</td>
<td>Rail</td>
</tr>
<tr>
<td>Social infrastructure</td>
<td>Public transport</td>
</tr>
<tr>
<td>Bulk infrastructure</td>
<td>Pedestrians</td>
</tr>
</tbody>
</table>

**Horizontal integration assessment**

**Cross-sectoral**

- Housing
- Economic, industrial, SEZ
- Social infrastructure
- Bulk infrastructure

**Vertical integration assessment**

- Connectivity
- Mobility

Legend:

- Integrated
- Partially integrated
- Not integrated

The horizontal integration assessment was derived by taking the following aspects into consideration per the criteria for the Moloto corridor:

- Housing/economic development:
  - The density of housing units within the communities along the corridor is low, implying low passenger density within the corridor. A low passenger density, in turn, requires modes with lesser capacity, as shown by the technology framework (see Chapter 8).
  - Due to limited employment opportunities within the corridor, residents wish to travel to Tshwane in search of employment opportunities, which gives rise to the need to travel from the area in the morning and commute back in the afternoon.

**PROPOSED INTERVENTIONS DEFINED PREVIOUSLY**

The existing interventions proposed respond to the need for improved connectivity, mobility and road safety and include:

- SANRAL road capacity upgrades
- PRASA Moloto rail corridor feasibility studies:
  - The proposed railway line stretches across 198 km, linking 24 railway stations in total.
- Several TOD interventions along the corridor are proposed per the SDF and economic development plans.

**INTEGRATION ASSESSMENT**

The integration assessment of the Moloto corridor revealed that the corridor provides a regional function and the projects proposed at this point related to a regional rather than a national or local context.
Social infrastructure:
- Significant investment is required to provide the required social infrastructure. The dispersed community patterns will result in high investment cost. A densification strategy is required to render services more financially viable.

Bulk infrastructure:
- The lack of bulk services in residential areas surrounding the corridor is far-reaching and the cost estimation to provide the communities with basic services nearly equals the cost of the implementation of the rail corridor.

Transport system:
The following modes and types of infrastructure are available within the corridor:
- Road network fully developed on Class 2–4 level roads needs to be provided
- Public transport services are available
- Commuter rail services are not available.

Pedestrian facilities to and from public transport services are, currently, not given sufficient priority.

INTERVENTION OPTIONS AND ALTERNATIVES
Significant capital investment is made into the corridor to eradicate the municipal service backlog and to provide social services in the short term. However, this spending needs to be supported by long-term economic development in the corridor to ensure sustainable development. To support this objective, the following alternatives need to be considered:

Horizontal integration alternatives
- Housing and economic development:
  - Corridor densification and TOD along the corridor, not only the proposed rail line link.

Vertical integration alternatives transport system

The following alternatives needs to be considered relating:

Long term
- Corridor densification and TOD along the corridor
- Supported by regular bus and taxi feeder services.

Road infrastructure:
- Road capacity upgrades on selected road sections.
  - Road capacity improvement will decrease congestion and travel time.
- Road traffic regulation enforcement to assist in vehicle road worthiness and improving driver behaviour. This will assist in the reduction of vehicle accidents.

Technology choice:
- Introduce an optimal modal solution that might be a combination of public transport modes per the technology choice framework:
  - It needs to be noted that rail is the most appropriate mode, given the distance, but has a limited business case due to the total number of daily passengers using services in the corridor. Due to the cost of implementation and patronage, rail subsidy will be very high.
  - The implementation of a rail link for regional connectivity needs to be supported by regular bus and taxi feeder services to and from the communities in the corridor.

ALTERNATIVES PRIORITISED
The alternatives presented in the preceding section can be implemented in the short, medium or long term. This strategy is not an indication of priority per se but proposes ways to address issues and challenges across sectors. The alternative prioritisations per implementation framework are:

Short term
- Selected road upgrades
- Road traffic regulation enforcement

Medium term
- Introduce an optimal modal solution that might be a combination of public transport modes as per the technology choice framework.
13.7.6 Case study 2: SIP 2 – Harrismith development node

The Harrismith development node forms part of SIP 2, which is aimed at improving freight mobility along the N3 to and from Durban, and includes:

- Capacity upgrades/the possible realignment of the N3 on sections where mobility function is compromised in the vicinity of Harrismith
- Implementation of a SEZ at Harrismith;
- Implementation of a Harrismith logistics hub
- Several housing projects (areas north of the existing CBD and Tshiame 10km west of the CBD) to stimulate growth.
- The improvement of mobility on the Van Reenen’s Pass

The Harrismith node and other related SIP2 and NATMAP 2050 transport-related projects are shown in Figure 13-11.

PROJECT CHALLENGES AND ISSUES

Harrismith is a significant diversion and conversion point of freight and other traffic along the N3 corridor. It is, furthermore, an important interchange of freight from the Free State to Durban via the N3.

Harrismith, as a town and halfway house for freight traffic, is economically dependent on the economic side effects associated with through traffic.

The N3 provides connectivity on a national and provincial level and is the corridor/road with the highest freight traffic in South Africa. Due to the significance of the N3, it is important that this road retain its mobility function. To this end, several alternative alignments have been proposed to preserve its mobility function, but these alignments will have major economic impacts on Harrismith.

On a regional and local level, the development of the SEZ near Tshiame and the logistics hub close to Hurdustria to the south of the CBD could help strengthen the economic viability of Harrismith. This might help to mitigate the impact of realigning the N3.

These two developments are located about 10km apart and situated in undeveloped areas connected by a minor road.

Figure 13-11 illustrates disjointed planning in that no linkages are proposed between housing schemes to the north of the CBD and the proposed economic developments to the south of Harrismith. Connectivity is available but with a much longer routing option.

The logistics hub is situated 10km from the SEZ along the NS. Logistic costs will increase if the HLH will be used as the main distributor of products produced in M-SEZ. It is also noted that some of the housing developments are situated to the north of the CBD and HLH with limited Class 3 road links joining them. In addition, the railway line forms a barrier between these developments. It will, therefore, be prudent to consider appropriate measures to reduce journey time and travel distance, including additional road links and public transport services. Public transport services are provided in the area by bus and taxi but do not connect the proposed developments in Harrismith.

Mobility roads are Class 3 to Class 1 roads. Within a town or local municipality, main nodes, including an SEZ or logistics hub, need to be linked to housing and other commercial developments with higher order roads.

INTEGRATION ASSESSMENT

The integration assessment considered the transport system at national, provincial and local levels. The focus of each assessment level is:

- The national assessment relates to the mobility function and realignment of the N3 to preserve the mobility function.
- The provincial assessment pertains to the national and main roads that link the SEZ and logistics hub to the Free State and other provinces.
- The local level assessment considers the mobility and connectivity of the SEZ, logistics hub and related housing developments in the area.

For the purposes of cross-sectoral integration, the assessment was applied to the SEZ, logistics hub and housing developments. The results of the integration assessment for the Harrismith development node are shown in Table 13-8 with reference to the selected projects per integration level.

![Figure 13-11: SIP 2 – HARRISMITH DEVELOPMENT NODE LOCALITY MAP](image)

Source: NATMAP 2050
### Horizontal integration assessment

<table>
<thead>
<tr>
<th>Cross-sectoral</th>
<th>Transport system</th>
</tr>
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<tbody>
<tr>
<td>Housing</td>
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### Vertical integration assessment

<table>
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<th>Local</th>
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<tbody>
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<td>Not integrated</td>
</tr>
<tr>
<td>Mobility</td>
<td>Integrated</td>
<td>Partially integrated</td>
<td>Not integrated</td>
</tr>
</tbody>
</table>

### Legend:
- Integrated
- Partially integrated
- Not integrated

### INTERVENTION OPTIONS AND ALTERNATIVES

The following alternatives are proposed to address the gaps identified by the integration assessment:

- Consider alternative N3 alignment to improve connectivity, accessibility and mobility to the Harrismith–Tshiame–Hardustria transport logistics node
- Enhance connectivity and accessibility between the northern housing projects and Tshiame and the HLH, CBD and SEZ by introducing:
  - A new link road (Class 3)
  - A regular bus service
- Improve accessibility to the NS from the SEZ
- Restore the NS’s mobility function through regular road maintenance
- Maintain secondary roads to provide access to the SEZ and HLH.

The proposed Class 3 and N3 alternative alignments are presented in Figure 13-12.

### ALTERNATIVES PRIORITISED

The alternatives presented in the preceding section can be implemented in the short, medium or long term. This strategy is not an indication of priority per se but proposes to address issues and challenges across sectors. The alternative prioritisations per implementation framework are:

- **Short term:**
  - Maintain secondary roads to provide access to the SEZ and HLH
- **Medium term:**
  - Enhance connectivity and accessibility between the northern housing projects and Tshiame and the HLH, CBD and SEZ by introducing:
    - A new link road (Class 3)
    - A regular bus service
- **Long term:**
  - Improve accessibility to the NS from the SEZ
  - Restore the N3’s mobility function through alternative alignment that meets both local economic focus and preserves the road’s national mobility function.

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**TABLE 13-8: SIP 1 – HARRISMITH NODE – INTEGRATION ASSESSMENT RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>Integrated</th>
<th>Partially integrated</th>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Mobility</td>
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</tbody>
</table>

**Figure 13-12:** SIP 2 – HARRISMITH DEVELOPMENT NODE PROPOSED ALTERNATIVES

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13.7.7 Case study 3: SIP 2 – Cornubia development node

SIP 2 is aimed at improving freight mobility along the N3 to and from the main industrial hubs in and around Durban. Hence, the evaluation focused on a metropolitan level of the integrated human settlement at Cornubia in close proximity to the Dube trade port IDZ. The regional locality in relation to SIP 2 and NATMAP projects are illustrated in Figures 13-13 and 13-14. The development extent at full development stage comprises:

- 24 320 housing units, of which 15 000 will be subsidised breaking new ground (BNG) units
- Schools, commercial activities and industrial development
- Phases 1 and 2 of the project are underway and include housing and retail.

PROJECT CHALLENGES AND ISSUES

The main issues and challenges identified relevant to integration are:

- Cornubia is not linked to other developments and the IDZ through public transport services
- Connectivity between development and employment opportunities is insufficient
- The development is isolated from the eThekwini CBD and other commercial and industrial development, limiting the residents’ ability to access employment opportunities.

Several high-order roads can be accessed from the proposed development. These include the M41/R102 and the N2. A new interchange forms part of the proposed development plan, which will provide direct access to the N2.

Long-distance passenger services are accessible from the development via a rail station situated to the north-east of the proposed development near Old Main Road. PRASA is planning to upgrade the station and services in the area.

INTEGRATION ASSESSMENT

Given the nature and extent of the proposed development the assessment focused on the metropolitan and local levels. For the purpose of cross sectoral integration, the assessment was applied to integration with Dube Trade Port IDZ given that the development is an Integrated Human Settlements Development.

The result of the integration assessment for the Cornubia Integrated Human Settlement is shown in Table 13-9.

**TABLE 13-9: SIP 1 – CORNUBIA INTEGRATED HUMAN SETTLEMENT – INTEGRATION ASSESSMENT RESULTS**

**Figure 13-13: SIP 2 – CORNUBIA MIXED USE DEVELOPMENT REGIONAL LOCALITY MAP**

Source: NATMAP 2050

A rail link between Cornubia, Bridge City and the Dube trade port and the King Shaka International Airport will enhance regional mobility and integrate the development at regional/provincial level.

Based on the total number of housing units and estimated number of person trips that will be generated from the development at full development stage, a BRT system will be a viable option to link Cornubia to employment areas such as the Dube trade port.

The development comprises mixed used development, providing, in the long term, educational facilities and commercial and retail development.

Other cross-sectoral elements are accommodated in the proposed development plan. The construction of schools will follow in later phases. Consequently, a scholar public transport system from the area to nearby schools will be required.
INTERVENTION OPTIONS AND ALTERNATIVES

The following alternatives are proposed to address the gaps identified in the integration assessment process.

- **Connectivity improvement:**
  - BRT presents the most viable short-term solution to link Cornubia to employment areas such as the Dube trade port.
  - An additional on-ramp should be considered for implementation on the north–south highway to Cornubia.

- **Mobility improvement:**
  - Examine whether rail is a viable mode to link Cornubia, Bridge City and the Dube trade port and the King Shaka International Airport in the medium to long term (supported by PRASA NSP).

ALTERNATIVES PRIORITISED

The alternatives presented in the preceding analysis have been prioritised for implementation in the short, medium or long term. This strategy is not an indication of priority per se but proposes to address issues and challenges across sectors. The alternative prioritisations per framework are:

- **Short term:**
  - BRT system to link Cornubia to the Dube trade port

- **Medium term:**
  - Additional on-ramp on the highway to Cornubia
  - Re-alignment of the R102 (at DTP) part of the ITP

- **Long term:**
  - Rail link between Cornubia, Bridge City, the Dube trade port and the King Shaka International Airport
13.7.8 Case study 4: SIP 3 – N2 Wild Coast (toll road)

SIP 3 promotes rural development by improving access to KwaZulu-Natal and national supply chains via the Wild Coast Highway. The proposal responds to a road safety concern along the N2 in the direct vicinity of Mthatha and the R61. The area is known to have of a high accident rate. Improvement to accessibility will be in the form of an upgrade on the N2 Wild Coast Highway and several secondary roads. The regional locality of the N2 between Port Elizabeth and Durban is shown in Figure 13-14.

The N2 Wild Coast Highway upgrade comprises three main road sections:

- The upgrading of the existing N2 with tolling proposals
- The upgrading of a section of the existing R61 and the proposal that this section form part of the tolled highway
- The introduction of greenfields sections on the proposed toll highway.

The estimated cost for the road upgrades, including greenfield sections, of the project is estimated at R 7.5 billion.

**PROJECT CHALLENGES AND ISSUES**

The upgrading of the N2 and possible tolling of the road takes place within the context of several factors:

- The upgrading of the R61 is constrained by limited funding. Therefore, tolling is considered as a funding mechanism.
- Several sections of the N2 and R61 require road capacity upgrades or rehabilitation.
- The N2 Wild Coast Highway provides mobility and connectivity to:
  
  - Agricultural freight movement
  - Tourism
  - General freight movements.

  - The N2 is the only Class 1 road for several communities in the Eastern Cape and, due to topography, an alternative secondary road network is limited.

  The N2 provides connection between Port Elizabeth and Durban. The N6, N9 and N10 provide connectivity with the provinces adjacent to the Eastern Cape. The Eastern Cape has an extensive Class 1 road network.

  An established secondary road network (R362, R61, R72, R75) provides alternative routes, should the N2 be tolled, although the origin destination journey distance will be much longer.

  Passenger transport options are available and accessible from main nodes in the vicinity of the N2. Passenger rail services, including the reintroduction of the Kei Rail, have been considered in the past to link majors centres along the N2, including Mthatha.

  The mobility function of the N9, N10, N6 and N2 is under pressure. Thus, road capacity upgrades are urgently required. With limited funding available for these upgrades, alternative solutions are required to help preserve the mobility function of these roads.

  The mobility function of a corridor is linked to the travel time between two points in a corridor. With the proposed upgrade and re-alignment of the N2, the travel distance between Mthatha and Port Shepstone will be 160 km instead of the existing distance of 240km. A considerable time saving can be achieved by constructing the greenfields section of the N2.

**INTEGRATION ASSESSMENT**

The integration assessment of the transport system was carried out at provincial level due to the connectivity function of the N2 Wild Coast Highway.

For the purposes of cross-sectoral integration, the assessment was applied to integration with tourism nodes and agricultural nodes in the corridor surrounding the N2.
INTERVENTION OPTIONS AND ALTERNATIVES

The following alternatives are proposed to address the gaps identified during the integration assessment process:

- **N2** – Road capacity upgrades in support of tolling:
  - Alternative secondary roads will not provide the same mobility and accessibility through the Eastern Cape, unless upgraded.
  - Commitment to upgrade selected secondary roads – 2016/17 (EC)

- **N9, N10, N6** – Upgrades along N6 and N9 started (SANRAL)

- **N9, N10, N6** – Upgrades along N6 and N9 started (SANRAL)

- **The tolling of the R61 is subject to:**
  - Local resident discounts

- **The non-tolling of the R61 is subject to:**
  - Forming part of SANRAL’s non-toll road network
  - Treasury/EC subsidisation of R61 asset management

ALTERTERVATIVES PRIORITISED

It is proposed that the alternatives presented in the preceding section be implemented in the short, medium or long term. This strategy is not an indication of priority per se but proposes to address issues and challenges across sectors. The alternative prioritisations per implementation framework are:

- **Short term:**
  - N2 – Road capacity upgrades in support of alternative funding options:
    - Alternative secondary roads will not provide the same mobility and accessibility through the Eastern Cape, unless upgraded.
    - Commitment to upgrade selected secondary roads – 2016/17 (EC)
    - N9, N10, N6 upgrades

- **N9, N10, N6** – Upgrades along N6 and N9 started (SANRAL)

- **Medium term:**
  No alternatives were recommended for medium-term implementation

- **Long term**: The tolling of the R61 is subject to:
  - Local resident discounts

- The non-tolling of the R61 is subject to:
  - Forming part of SANRAL’s non-toll road network
  - Treasury/EC subsidisation of R61 asset management
13.7.9 Case study 5: SIP 3 – Port Elizabeth–Coega IDZ

The Coega IDZ development node comprises the IDZ, the upgrading of the manganese rail line from Hotazel to Ngqura, and the associated port upgrade and expansion. Several housing developments are planned in the direct vicinity of the IDZ to provide the necessary and appropriate housing stock.

Several social housing schemes are planned or being implemented in the Nelson Mandela Bay Metropolitan Municipality. These housing developments will be the main areas where people who work in the IDZ will live. The schemes that are considered to form part of the project are the Coega Ridge development, the Chatty, Joe Slovo West, Soweto-on-Sea and Veeplaas areas, Bay West and the N2 integrated development.

PROJECT CHALLENGES AND ISSUES

The main challenge relating to the project is to ensure connectivity between the housing schemes and the IDZ – that is, that the expansion of the road network and the selection of the appropriate mode of transport can accommodate the passenger demand and travel distance.

All housing schemes linked to the IDZ are connected by Class 2, 3 and 4 roads, except the Coega Ridge development. The implementation of connecting metropolitan road networks and high-order roads forms part of the road master plan of the city.

The proposed housing schemes are situated along planned BRT routes and existing bus, taxi or rail services. The planned BRT express routes pass the Coega Ridge housing development but there is no a feeder system from the development to these services. Thus, no direct connectivity or link between the housing development and the IDZ exists. It will be appropriate to consider the appropriate mode to link the housing developments and the Coega IDZ with the planned BRT or rail connections.

PRASA proposes the implementation of the Motherwell loop to accommodate the needs of the travelling public in the vicinity of the Coega IDZ. Implementing both BRT and rail modes appears to be an oversupply of public transport services. These services need to be considered wisely.

INTEGRATION ASSESSMENT

The integration assessment of the transport system was carried out at metropolitan level due to the locality and influence of the IDZ on passenger transport.

For the purposes of cross-sectoral integration, the assessment was applied to integration between housing, transport modes and the locality of the proposed housing developments.
INTERVENTION OPTIONS AND ALTERNATIVES

As an outcome of the integration assessment, the following alternatives/options are proposed:

- Re-align the planned BRT routes or provide an appropriate feeder system to enhance connectivity between the Coega Ridge housing development and the Coega IDZ
- Continue with the PRASA Motherwell loop implementation once sufficient passenger volumes exist and ensure that the BRT system serves as a feeder to the rail corridor.

ALTERNATIVES PRIORITISED

The alternatives presented in the preceding section can be implemented in the short, medium or long term. This strategy not an indication of priority per se but proposes to address issues and challenges across sectors. The alternative prioritisations per implementation framework are:

- **Short term:**
  - Change the planning of the BRT and Coega Ridge development to allow for a BRT service to link with the Coega Ridge housing development and the IDZ
  - Introduce dedicated BRT services with express services in peak periods.

- **Medium term:**
  - Proceed with the planning of the PRASA passenger rail infrastructure – the Motherwell loop
  - Establish BRT services to accommodate passengers.

- **Long term:**
  - Continue with the Motherwell loop construction to increase connectivity and mobility beyond 2020.

13.7.10 Conclusion

This chapter expands upon the previous chapters by defining how the DoT and its partners can enable the delivery of the interventions and strategies defined by the NATMAP 2050 to bring about the NATMAP 2050 vision.

This sub-section demonstrates the application of the framework and the option selection process. It demonstrates how the NATMAP 2050 should be used to create alignment, integration and coordination between selected strategic integrated projects (SIPs), and other sectors (refer also to Figure 13-16 for an overview of the implementation, alignment and integration case studies that are discussed in this chapter). It clearly demonstrates how the NATMAP 2050 bridges the gap between disjointed planning and implementation practices, leaving a transport system that fully supports cross-sectoral initiatives and projects.

The delivery of the NATMAP 2050 as a master plan is very important in defining the course of action for transport in South Africa. The priority areas with the identified interventions that have to be implemented are well aligned and integrated with other government strategic plans to realise the NATMAP 2050’s bold vision and objectives.

The DoT is committed to supporting the prioritised implementation of the interventions and actions defined in this important plan.
FIGURE 13-16: CONCLUSION MATRIX DEMONSTRATING IMPLEMENTATION, ALIGNMENT AND INTEGRATION

<table>
<thead>
<tr>
<th>National Strategy</th>
<th>National Development Plan 2030</th>
<th>Sector Departments</th>
<th>Economic Development Department</th>
<th>Department of Rural Development and Land Reform &amp; CoGTA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Department of Transport</td>
<td>Department of Human Settlement</td>
<td>Economic Development Department</td>
</tr>
<tr>
<td>Plans, Programs, Frameworks</td>
<td>NATMAP 2050</td>
<td>Master Spatial Plan (DoT partnering in the Development Phase)</td>
<td>SEZ/IDZ Program IPAP</td>
<td>NIP (SIPs)</td>
</tr>
<tr>
<td>Implementation (Alignment and Integration)</td>
<td>Moloto Passenger Corridor (DOT)</td>
<td>Gap identified: Dispersed settlement patterns</td>
<td>Gap identified: Economic Development Corridor</td>
<td>SIP 1 (DOT Role) Road Improvement Rail Corridor Investigation</td>
</tr>
<tr>
<td></td>
<td>Harrismith Development Node (DOT, FEDC, District and Local Municipalities)</td>
<td>Potential: Plans to develop Mixed-Use Development</td>
<td>SEZ and Harrismith Logistics Hub Spatially disconnected</td>
<td>SIP 2 (DOT Influence) Improve linkages to N5</td>
</tr>
<tr>
<td></td>
<td>Cornubia Development Node (eThekweni Municipality)</td>
<td>Cornubia Housing Settlement (anchor)</td>
<td>Dube Trade Port linkages King Shaka International Airport</td>
<td>SIP 2 – improved N3 links</td>
</tr>
<tr>
<td></td>
<td>N2 Wild Coast (DoT - SANRAL)</td>
<td>Tolling implications on marginal settlements and communities</td>
<td>Limited to tourism Potential to improve links SIP 3 node (PE), KZN &amp; WC</td>
<td>SIP3 – strong Transport and Logistics link to the regional area</td>
</tr>
<tr>
<td></td>
<td>Port Elizabeth – Coega IDZ (Dept. Human Settlement)</td>
<td>Several housing developments planned within vicinity of IDZ</td>
<td>Port of Ngqura Coega IDZ</td>
<td>SIP 7 – BRT expansion</td>
</tr>
</tbody>
</table>

**Notes:**
- NATMAP 2050: National Spatial Development Policy 2050
- SEZ/IDZ: Special Economic Zone/Industrial Development Zone
- IPAP: Integrated Planning and Agricultural Policy
- SIP: Strategic Implementation Plan
- NSDF: National Spatial Development Framework
- IUDF: Integrated Urban Development Framework
- DOT: Department of Transport