GRA IN ACTION SERIES

South Africa's Roadmap of Action toward Sustainable Mobility

SUSTAINABLE mobility FOR ALL™

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SUSTAINABLE mobility FOR ALL

South Africa's Roadmap of Action toward Sustainable Mobility

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List of Abbreviations

BRT	Bus Rapid Transit
CPM	Catalogue of Policy Measures
DBSA	Development Bank of Southern Africa
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GNI	Gross National Income
GRA	Global Roadmap of Action toward Sustainable Mobility
GTF	Global Tracking Framework
GTS	South Africa Green Transport Strategy
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
ILO	International Labor Organization
IRAP	International Road Assessment Programme
IRF	International Road Federation
ITDP	Institute for Transportation and Development Policy
LPI	Logistic Performance Index
NATMAP	South Africa National Transport Master Plan (2005–2050)
MTSF	Medium Term Strategic Framework
NHTS	National Household Travel Survey
NIP	National Infrastructure Plan
NMT	Non-Motorized Transport
NPC	Nation Planning Commission
OECD	Organisation for Economic Co-operation and Development
PAP	Prototype Action Plan
PPP	Public–Private Partnership
PRASA	Passenger Rail Agency of South Africa

RAI	Rural Access Index
RAS	Reimbursable Advisory Services
RTMC	Road Traffic Management Corporation (South Africa)
RTR	Rapid to Transit Ratio
SADC	Southern African Development Community
SAMSA	South African Maritime Safety Authority
SANRAL	South African National Roads Agency
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
SuM4All	Sustainable Mobility for All
UIC	International Union of Railway
UITP	International Association of Public Transport
UMIC	Upper Middle-Income Countries
UNCTAD	United Nations Conference on Trade and Development
UNECE	The United Nations Economic Commission for Europe
VNR	Voluntary National Review
WHO	World Health Organization

Foreword

Sustainable Mobility for All (SuM4All) is the premier advocacy platform for global international cooperation on transport and mobility issues. It is an innovative model for action in transport that leverages the knowledge, expertise, and influence of its 56 Member organizations—international organizations and companies—to assist countries worldwide in their ambition to attain universal access, efficiency, safety, and green mobility.

In 2020, the partnership applied its innovative approach for improved public decision making in transport to South Africa, using the set of tools it had developed—the Global Tracking Framework for Transport, Catalogue of Policy Measures, and Selection Algorithm. South Africa was looking for ways to tackle vulnerabilities in the transport system and accelerate progress toward the Sustainable Development Goals and the Paris Climate Agreement. During the initial phase of the study, COVID-19 struck unexpectedly, and immediately impacted transport systems globally. The pandemic highlighted a need to upgrade several tools to make the resilience of transport systems a more prominent component of the innovative approach. The Catalogue of Policy Measures was expanded with the addition of 12 new measures to respond to this public health crisis, and new criteria were added to the selection algorithm to sort out policy measures on resilience.

This paper illustrates how these tools were applied in a country context to generate a set of most impactful policies and investments. This case study validated the power of the tools for improved public decision making in transport as well as its readiness to be replicated for countries interested in reaching the SDGs and the Paris Agreement targets, by making the right policy and investment choices in transport.

Sustainable Mobility for All Steering Committee
(On behalf of our 56 Member organizations)
December 2022, Washington, D.C

Acknowledgments

This paper is one of the three papers produced on South Africa in the GRA in Action series by the Sustainable Mobility for All (SuM4All) Partnership with the World Bank and the Development Bank of Southern Africa (DBSA), and will be one of the inputs to the Transport Sector Report produced by a World Bank Team for the Replace with Reimbursable Advisory Services (RAS) *Beyond the Gap in South Africa*.

This paper was prepared in 2021 by a group of organizations coalesced under the SuM4All umbrella. This group (Piloting the Global Roadmap of Action toward Sustainable Mobility in South Africa) was led by Nancy Vandycke (World Bank) and consisted of Justin Coetzee (GoMetro); Mienke Knipe (GoMetro); Thilly De Bodt (ICAO); Maha Mousavi (ICAO); Antonin Combes (ICAO); Gyorgyi Gurban (IMO); James Bradford (iRAP); Susanna Zammataro (IRF); Julia Funk (IRF); Nicolas Beaumont (Michelin); Itumeleng Makgobathe (Michelin); Claire-Marie Bernard (Michelin); Jan Hoffmann (UNCTAD); Luisa Rodriguez (UNCTAD); Gurpreet Singh Sehmi (World Bank); Mary Ngaratoki Fabian (World Bank); Jose Viegas (Consultant) and Samuel Lee (World Bank).

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Executive Summary

South Africa was looking for ways to tackle vulnerabilities in the transport system and accelerate progress toward the Sustainable Development Goals and the Paris Climate Agreement. The country has covered creditable ground in its progress to meet the Sustainable Development Goals (SDGs) and the Paris Climate targets; nonetheless, a considerable distance remains to be overcome.

Research points to a clear correlation between quality of transport systems and progress on the SDGs, and therefore, squarely delivers the responsibility of tackling vulnerabilities in the transport and mobility system to the country's government. According to the global sustainable mobility composite score, South Africa ranks a modest 88 out of 183 countries, and third among Sub-Saharan African (SSA) countries.

In 2020, the Sustainable Mobility for All partnership applied its innovative approach for improved public decision making in transport to South Africa, using the set of tools it had developed—Catalogue of Policy Measures, and Selection Algorithm–to generate a country action plan of 31 most impactful policy measures to achieve sustainable mobility. Sustainable mobility is defined as the achievement of four global policy goals: universal (equitable) access, efficiency, safety, and green mobility. This definition is an emerging standard that is increasingly accepted by the international transport community, and is aligned with the Department of Transportation's National Transport Master Plan 2005-2050 vision of South Africa.

During the initial phase of the study, COVID-19 struck unexpectedly, and immediately impacted transport systems globally. The pandemic highlighted a need to upgrade several tools to make the resilience of transport systems a more prominent component of the innovative approach. The Catalogue of Policy Measures was expanded with the addition of 12 new measures to respond to this public health crisis, and new criteria were added to the selection algorithm to sort out policy measures on resilience.

The country's action plan was generated from a prototype action plan (PAP)–the result of the mechanistic application of the Selection Algorithm to the Catalogue of Policy Measures. Each measure in the PAP is then assessed against a set of 11 criteria (country relevance, alignment with national priorities and national transport strategy, the level of adoption and implementation, barriers to implementation, public resources, governance and institutional capacity, and the process for monitoring and evaluation), and further calibrated through in-country engagement with relevant authorities and local experts.

The country action plan (Table ES.1) identified that the most impactful policy measures would cluster around optimization of existing transport infrastructure assets instead of new investments. All policies and investments in the action plan should be geared towards improving the quality of South Africa's transport system—that is resilient and Paris aligned.

The South Africa case study validated the power of data, more precise comparative analysis, and overall importance of a coherent framework of action to inform and guide policy and investment choices for transport.

Table ES. 1. South Africa Action Plan toward Sustainable Mobility.

Global Policy Measure	Policy Measure brief description for South Africa
Policy #2. Improve the quality and safety of public transportation.	A differentiated approach where dedicated infrastructure investments support integrated public transport networks, which are prioritized in urban metropolitan municipalities. Public–private partnerships are to support reinvestment in infrastructure and provide reliable, frequent, and safe urban rail services.
Policy #19. Require service providers to report standardized data.	Reported data should include those necessary for a general public investment prioritization model, which can be implemented by different agencies and at varying scales of government. It also highlights the need to protect commercially sensitive data. In addition, freight operators should collect and share origin and destination data so as to enable the investment prioritization model to identify freight routes better, and specifically freight routes that support export activities.
Policy #21. Develop asset management standards	The adoption of an appropriate asset management system for road and rail infrastructure., which would, for example, efficiently prioritize road investment according to the roads sector mandate to: (i) satisfy citizens' right of access to constitutionally protected basic services, and (ii) maximally contribute to economic growth.
Policy #3. Consult with stakeholders during the full project cycle.	Support demand-responsive public transport planning and services. Mobile technology platforms have already shown business models greater efficiency in meeting passenger demands, which can be incorporated into system communication platforms and applications. The National Road Safety Strategy calls to recognize the critical role of stakeholder engagement. It requires any new strategy to consult on resource and service prioritization guidelines for identifying features that need special in situ testing to accommodate varying regional conditions and needs.
Policy #5. Implement anti-harassment campaigns in public transport.	Four-fold responsibilities: (i) coordinate greater safety and security and devolve function to local government and police; (ii) improve the availability of reliable statistics around sexual harassment on transport services; and (iii) implement transport planning, safety plans, and transport service design such as woman and children only coaches; (iv) advocate and engage on the impact of harassment with transport operators and commuter organizations.
Policy #7. Adopt sanitary protocols and reduce crowding in passenger transport.	Enforce existing regulatory provisions need to be better enforced to ensure masks are worn and that social distancing on long-distance trips are complied with to mitigate the transmission of COVID-19. This is especially pertinent given that the majority of commuters use minibus taxis. The poor, vulnerable, and marginalized must always be cared for: without this, any post-COVID-19 reconstruction is undermined.
Policy #8. Implement smart and contactless fare collection systems.	Keep systems' requirements at a minimum and establish the provision of standards to ensure interoperability that supports innovation and competition in the supply of systems. Adopt a prerequisite agreement between transport operators on interoperability requirements. to Support users with awareness campaigns to understand the use of Automated Fare Collection (AFC) and with information centers to handle queries or complaints.

Policy #11. Define key laws for safety rules.	Better enforce existing safety legislation and regulation. Information is needed to evaluate performance in this regard and manage these services better. Technologies such as vehicle tracking devices allow for greater enforcement without additional capacity required, hence such devices should be a requirement for operating licenses.
Policy #12. Establish a State Aviation Safety Oversight System.	Establish an Aviation Safety Investigation Board and create a Single Transport Economic Regulator— in line with the National Transport Master Plan— to improve safety oversight and competition in the sector.
Policy #14. Remove non-tariff barriers for international trade.	Monitor Inward investment policies and support, which add to costs, for impact in the transport sector. However, low skill levels, high unemployment, and poverty levels require a sensitive approach to lowering non-tariff barriers.
Policy #26. Facilitate capacity building at the international level.	Open opportunities for international support and capacity development, which would be relevant and valuable in addressing low levels of affordability, rapid urbanization impacting on urban mobility pressures, informal transport efficiency, safety, and climate challenges for warmer, semiarid counties—focusing on a regional level.
Policy #31. Build capacity across levels of government.	Focus less on national strategy and planning and more on capacity development for local government. Support planning, transport service, and public–private–partnership (PPP) contracting management, procurement for outcomes-based tenders, as well as monitoring for outcomes, which will be vital. Municipalities should also augment their own capacity through institutional arrangements available to local governments.
Policy #1. Make public transport fares affordable for the poor.	Improve the safety and security of public transport while increasing affordability to attract commuters to public transport (including rail) to reduce household costs. Subsidize transfers between a minibus taxi and bus services to rail stations to attract passengers; shift derivation of revenue from passengers to derivation from all who benefit from expanded and improved rail provision and consider fully subsidizing urban rail services.
Policy #6. Develop mobility plans at subnational levels.	Support integrated public transport planning in urban areas through the devolution of public transport contracting authority to municipalities and urban rail assignment to urban metros. In rural and peri-urban areas, local planning should include access to bicycles and safe cycling paths; be aligned to local investment and subsidization programs and prioritize investment that would support local economic development.
Policy #9. Ensure access to transport services (including economic and social opportunities) in underserviced areas.	Address underserviced areas through urban Integrated transport and land use management. Transport solutions alone will not increase accessibility. It is critical to focus on land use management to increase development in underserved areas, along transport corridors as well. This may include shifting existing social services to improve accessibility.

Policy #15. Build complete multimodal networks (including freight).	Integrate commuter rail fully in the strategic framework with urban development plans and allow it to be assessed as part of an integrated multimodal transport and urban restructuring strategy to serve passengers within integrated Public Transport Networks or Integrated Transport Plans. Consider major local attractors and mixed development opportunities. This way, the country can achieve progressive improvements in modal efficiencies. Alignment between freight rail, road freight, and port operations can unlock value in the transport sector. A network of inland ports and economic regulation would then support open access to the networks for private operators and couriers.
Policy #20. Remove barriers to intermodal interoperability or Invest in intermodal operability.	Devolve functions to local governments to limit delays in implementing legislation for provincial bus contracts to be renewed through tenders, which thus far have resulted in monopolistic tendencies in the sector and limited opportunities for new entrants. Services that support interoperability can then be put out to the market. The monopolistic nature of passenger rail services has led to the lack of capacity to serve existing demand, low service quality, and underinvestment in passenger rail. Urban rail should be devolved to local regions and investment supported through private sector investment to support intermodal networks in urban metropolitan areas. Interoperability for freight transport can be enhanced by opening the sector to greater private-sector participation. An independent regulatory function will support this transition to increase concession and innovation between freight transport operators.
Policy #22. Use a robust framework for prioritization[2]	Extend the prioritization framework beyond new and strategic capital projects, or project appraisal focus, to also cover the efficient scheduling of maintenance activities. An effective road investment prioritization model must not misinterpret basic access rights as an objective that can be traded off for economic growth. The prioritization model must reflect the long-standing national priority to increase economic growth via export promotion, particularly higher value-added products. The road investment prioritization model must be implementable at a network level and be designed so as to yield the same ranking of projects regardless of the level of decision and implementation responsibility at which it is applied.
Policy #27. Coordinate Planning across government agencies[3]	Extend planning coordination beyond the transport sector to include associated departments. The relocation of basic education and healthcare facilities to optimal locations within underserved areas presents the government with a means through which to improve service-isolated areas (see policy #9). It dually requires the devolution of contracting authority to municipalities and urban rail assignment to urban metros.
Policy #4. Expand Public Transport Infrastructure.	Expansion of transit services may not increase accessibility. Be clear on institutional responsibilities for local government. Clarify the strategic direction of BRT investment only in large metropolitan areas, conventional bus services in smaller metros and secondary cities, and public transport road network upgrades in rural areas. Highlight clear policy objectives and the subsidy policy of the national government and provide for the relevant funding conditions and reporting requirements.

Policy #13. Plan for integrated multimodal networks.	Intermodal transport networks are important across passenger and freight transport. Let robust framework guide or inform the prioritization of projects (see policy #22) and national maintenance planning. Differentiate between metropolitan municipalities, where congestion requires significant infrastructure investment to offset against travel time and operating cost impacts; other municipalities may not need full BRT systems because they do not have the same congestion-related challenges. Project prioritization—based on an assessment of the impact on accessibility—and alternative land use management options are fundamental to the success of this policy.
Policy #17. Harmonize construction standards along corridors.	Effective transport, communications, and meteorology systems are prerequisites for economic growth and improved quality of life. Recognizing that closer integration of these sectors offers benefits to the region, the Southern African Development Community passed the Protocol on Transport, Communications, and Meteorology in 1996. Standards to support green technology can help in their adoption, support innovation, and reduce emissions. Additionally, if construction standards are adopted, it facilitates a stable operating environment for drivers and also leads to cost reduction in construction as standard equipment and procedures can be adopted leading to increased productivity and decreased errors.
Policy #24. Build rail and maritime transport infrastructure.	Encourage energy and space-efficient modes such as rail and maritime transport for investment. Traffic volume in the freight rail network specifically justifies such investment that can shift traffic from roads. These investments should ideally be powered by renewable and sustainable sources of energy. However, even if powered by "dirty electricity", rail will be several times more energy efficient than the road, so less GHG polluting. The state of rail infrastructure has significantly deteriorated in the last decade, largely due to the organizational failure of the Passenger Rail Agency of South Africa. The infrastructure of PRASA should be audited to determine the costs of bringing the service back to full system capacity.
Policy #25. Develop (and implement) an integrated National Transport Plan.	South Africa concluded the National Transport Master Plan (NATMAP) 2050 project in 2009. It is largely supportive of the four SuM4All policy goals—universal access, efficiency, safety, and green mobility—in the general sense. This policy recommends ensuring better integration between different public transport modes, thereby enabling optimal matching of transport services and demand patterns. Improve basic data as required in the Transport Register and Public Transport Plan (see policies #19 and #30).
Policy #10. Set Design Standards for Sidewalks and Bicycle Paths (to Facilitate Adding Sidewalks and Paths as Standard Parts of Road Upgrades).	Construct sidewalks in rural areas sealed and wide. These standards should cover construction and maintenance standards and focus on labor-intensive work methods. This requires that materials used in the construction of sidewalks or 'pavements' in the local idiom, be amenable to routine maintenance without sophisticated machinery. This principle on the choice of materials should also be applied to road surfacing decisions.

Policy #23. Set and implement climate change adaptation standards.	All transport sectors should consider climate change in their investment and maintenance strategies. It advocates for clarity on intergovernmental roles and responsibilities for mechanisms, systems, and procedures to give effect to the country's obligations of international climate change-related agreements. As an example, it recommends for environmental reasons—considerations of safety, access, and efficiency—road departments should seal gravel roads at the highest rate possible within budget limitations in accordance with a prioritization model.
Policy #16. Accede to and implement international conventions.	The Treasury should implement an explicit line-item revenue budget for a transport-related carbon tax and similar measures to ensure long-term sustainability. However, stricter enforcement measures may increase corruption and the incentive to bribe traffic officers. Therefore, technology solutions such as vehicle tracking devices can reduce bribery and corruption.
Policy #18. Identify risks and vulnerabilities to extreme weather events.	Early, preventive road maintenance is crucial in managing the cost of climate change on South African roads. The development of road asset management systems facilitates preventive maintenance to extend the lifespan of road assets and reduces vehicle operating cost.
Policy #28. Leverage innovative forms of mobility during crisis response.	Innovative forms of mobility embrace crisis response and beyond in South Africa. This can be done by addressing the existing barriers to innovate including social acceptance, logistical challenges for scale up, and government support. Additionally, local planning and autonomy may improve the extent of transport network coverage attracting private transport users to public transport and reducing emissions.
Policy #29. Share knowledge on successes and best practices.	Harmonize and support the SADC-SATCC Protocol on Transport, Communications, and Meteorology. It seeks to advance the common regional economic and social prosperity through a process of regional integration. The protocol highlights the regional and global character of the transport sector, and as such seeks to integrate and cooperate in transport matters between member states.
Policy #30. Develop data repositories and data collection guidelines.	Service providers should report standardized data. For example, regulations need to be amended so that operators install a tracking device that allows for the collection of standardized information. Once reported, these data should be housed within an effective data repository to improve the consistency and availability of existing data. Data must be of a quality that can be used for compliance with operating license terms, standardized to allow for planning, and publicly accessible to support transport innovation.

1. Context: Underlying factors that frame South Africa's mobility

South Africa is committed to the attainment of the Sustainable Development Goals (SDGs), the Paris Climate Agreement, and the African Union's Agenda "The Africa We Want"[1] to achieve a prosperous society that attests to inclusive growth and sustainable development. The country's National Development Plan: Vision 2030[2] embodies such ambition, which defines the country's blueprint for economic growth and development.

South Africa took stock of its SDG and climate goals' progress in its voluntary national review (VNR)[3] The country had improved its performance on several SDGs, including food security, education, and health (SDG 2, 3, and 4), but had made less progress in other areas. Poverty rates remain disproportionately high among black South Africans, female-headed households, the less-educated, and the rural population (SDG 1). Severe disparities in income distribution characterize South Africa, making it one of the most unequal countries in the world (SDG 10). Progress has yet to permeate informal settlements that still lack access to electricity, and the primary source of electricity generation continues its reliance on fossil fuels (SDG 7).

South African transport infrastructure is well developed but deteriorating, putting South African firms at a disadvantage both in domestic and global markets. This hampers growth in labor demand. South Africa ranks 64th on the World Economic Forum's 2016–17 infrastructure index, second in Africa to Mauritius and ahead of Brazil and India, but worse than China and Russia. While South African infrastructure is still of a high quality for a middle-income country; it faces deteriorating upkeep. Ten years ago, South Africa ranked 49th, contributing to a decline in the efficiency of transportation services (SDG 9).

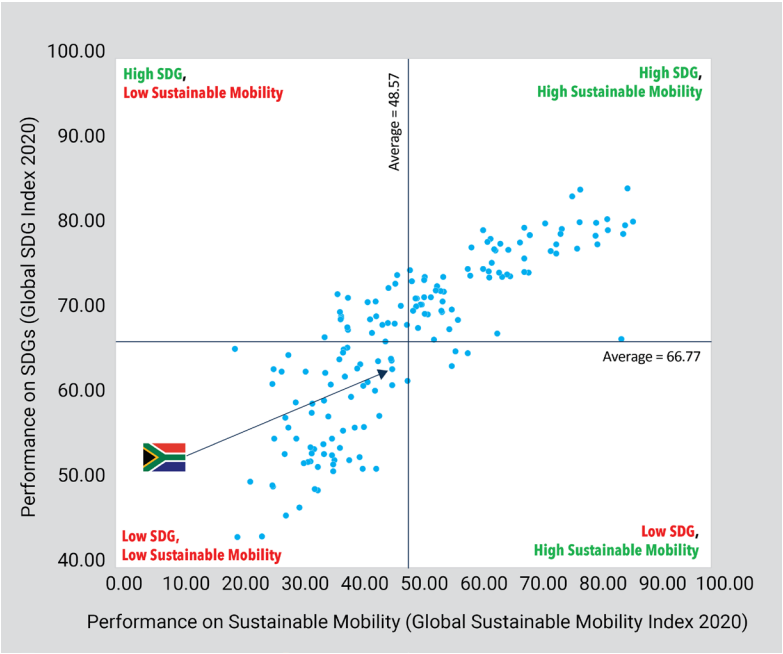
High quality, safe, reliable, and effective public transport is not available to the majority of South Africans. Whereas only 7.5 percent of poor households report no access to buses, trains, or taxis, the quality, cost, and reliability of the service available leave much to be desired. Across South Africa, only 13 percent of poor households have access to train service, about 50 percent to public buses, and more than 90 percent to minibus taxis. Taxis are usually within 10 to 30 minutes walking distance. This lack of strategic integration and coverage threatens the sustainability of cities and impairs social inclusion (SDG 11).

While South Africa has progressed in the attainment of the SDGs, considerable distance remains to the attainment of these objectives. According to the global SDG index of 2020 that tracks countries' performance on progress toward the 17 SDGs, South Africa ranks 110th or in the bottom one third of all 166 countries being monitored, underlining the need for greater commitment to achieve the country's objectives in this respect.

A key focus in that commitment should be to tackle vulnerabilities in the transport and mobility system.[4] Research clearly correlates the nexus between a country's progress on the SDGs and the quality of its transport systems.[5] On average, countries with the highest scores on the SDGs have

more robust and sustainable transport systems in place, while those with the lowest progress on the SDGs score poorly in the quality of their transport system. Unless South Africa tackles key weaknesses in its transport and mobility system, it is unlikely to make considerable progress toward or attain the SDG targets (figure 1.1).

Figure 1.1. Global SDG and Global Sustainable Mobility Index Score, 2020.



Source: Sustainable Development Solution Network (SDSN) SDG index and Sustainable Mobility for All —authors' own computation.

Transport is central to multiple planning efforts in South Africa. The National Development Plan 2030 (NDP), for example, calls for "the development of economic infrastructure as the foundation of social and economic development."[6] In response to the COVID-19 pandemic, the Economic Reconstruction and Recovery Plan–2020 reiterates the need for infrastructure investment: "Infrastructure investment, delivery and maintenance will play a leading role in South Africa's economic reconstruction and recovery. A large-scale infrastructure programme will boost aggregate demand, assist in reviving the construction industry and contribute to employment creation."[7] This plan recognizes the imperative to attract private sector investment in the delivery of infrastructure as part of building broad-based public–private partnerships (PPPs). These partnerships will allow for blended finance for projects or programs that are partially viable with social or economic impact.[8]

South Africa's National Department of Transportation (DOT) developed the National Transport Master Plan (NATMAP) 2050[9] and the Green Transport Strategy (GTS) for South Africa– 2018–2050 to create the "virtuous cycle of expanding opportunities" and the urban mobility as desired by the NDP 2030. The government unveiled substantial investment plans on infrastructure, which included improving the country's roads, railways, and ports.[10] South Africa's draft revised white paper on National Transport Policy 2017[11] determined that a key policy objective was to reduce household expenditure on public transport to 10 percent of disposable household income. For passengers, this means the cost of transport should represent a reasonable and declining percentage of disposable income for the 56 percent of urban households who currently spend more than 10 percent of household income on transport, as measured in the General Household Survey of 2017.[12]

The 2019–2024 Medium Term Strategic Framework (MTSF)[13] consolidates the medium-term objectives set out in the NATMAP 2050. The policy framework: (i) targets the expansion of integrated public transport networks in cities and support for transit-oriented development; (ii) calls for the downscaling of bus rapid transit (BRT) specification and technical norms and standards; and improved services levels. Private sector participation will help modernize the urban rail network and system and upgrade the Metrorail. Key outstanding policy issues highlighted in the NATMAP 2050 relates to the devolution of public transport responsibilities, alignment of land use and transport planning, the development of an overarching public transport subsidy policy, and appropriate public transport strategies and modal choices that ensure financial viability of services.

The National Infrastructure Plan 2045 (NIP 2045) will "spell out the government's intentions to build, manage and maintain infrastructure within a unified vision that enables South Africa to grow, address our inequality and capture our strengths as a nation, within the region and internationally, for the next 24 years."[14] It also provides investors with a clear picture of the government's future infrastructure plans, in particular the transport infrastructure which has been a binding constraint. A greater focus on transport—which has witnessed falling investment commitments—energy, water, and ICT infrastructure will be critical as the lack of quality infrastructure structural constraints regional trade. Transport costs along the Southern African Development Community (SADC) corridors are the highest in the world; for example, it takes eight days to cover 2,000 kilometers from Durban port to Lusaka. Border posts impose significant costs, adding monetary costs and time delays.

The National Road Safety Strategy 2016–2023[15] highlights the vital role of driver behavior as a key factor contributing to road fatalities. Road safety education and awareness remain fundamental to reduce road fatalities, as is enforcement. Infrastructure design to increase the safety of pedestrians is prioritized as fatality rates of pedestrians and children are high. The strategy requires effective leadership, governance, and improved data and knowledge management.

Transport contributes 13 percent of GHG emissions in South Africa.[16] Carbon emissions are driven by a reliance on road-based transport and spatial inefficiency. South Africa pledged to reduce its emissions below the business-as-usual growth trajectory by 34 percent by 2020 and 42 percent by 2025. By 2015, mitigation efforts resulted in a 19 percent reduction in GHG emissions since 2000.[17]

All these efforts, plans, and vision testify South Africa's commitment to tackle vulnerabilities in the transport and mobility system. However, it is also widely recognized that South Africa's transportation system is falling behind on many grounds; while policies exist, they are poorly or not implemented. Institutional barriers and lack of capacity within departments prevent the translation of such policies on paper into action.

Notes

1 https://au.int/en/agenda2063/overview

2 NPC (National Planning Commission). 2012. *National Development Plan 2030. Our Future – Make it work*. Pretoria. https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf

3 DPME (Department of Planning, Monitoring and Evaluation). (2019). South Africa's Voluntary National Review (VNR) Report 2019. https://sustainabledevelopment.un.org/content/documents/23402RSA_Voluntary_National_Review_Report__9_July_2019.pdf

4 Mobility system is broader than the transport system, for example, the mobility system includes considerations about land planning, environment, affordability, and quality of transport options, among others, while the transport system does not.

5 Vandycke, N. and Fabian, M. 2020. *Sustainable Development Goals: What if transport was the missing piece?* Transport for Development. World Bank, March 17, 2020. https://blogs.worldbank.org/transport/sustainable-development-goals-what-if-transport-was-missing-piece

6 The Presidential Infrastructure Coordinating Commission identified infrastructure gaps through their analysis of future population growth, projected economic growth and areas of the country that are not served with infrastructure.

7 The Presidency, South Africa Economic Reconstruction and Recovery Plan, 2020.

8 The Presidency, Sustainable Infrastructure Development Symposium, South Africa, June 2020.

9 Department of Transport, 2016 National Master Plan, 2050

10 Creamer, T. 2019. "Infrastructure Fund Project Pipeline Stands at R700bn, DBSA Reports." Creamer Media's Engineering News, November 16. https://www.engineeringnews.co.za/article7/infrastructure-fund-project-pipeline-stands-as-r700bn-dbsa-reports-2019-11-06/rep_id:4136

11 https://www.gov.za/sites/default/files/gcis_document/201803/nationalwhitepapertransportdraft_1.pdf

12 StatsSA General Household Survey, Selected Development Indicators, Metros, 2017

13 Presidency, 2019 – 2024 Medium Term Strategic Framework, Comprehensive Report

14 https://legal.sabinet.co.za/articles/national-infrastructure-plan-2045-under-the-spotlight/

15 Department of Transport, National Road Safety Strategy, 2017

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17 South Africa's Progress Towards Its Development Objectives, 2020 Assessment Report published February 2021 by Bureau for Economic Research (BER) www.ber.ac.za

2. Task at Hand

In 2020, South Africa agreed to the pilot use of a set of new tools developed by the Sustainable Mobility for All partnership to help understand the current status, progress, and key priorities in transport. The tools include the Global Tracking Framework for Transport (GTF)[1], and the Global Roadmap of Action toward Sustainable Mobility (GRA 2.0).[2] The GRA 2.0 consists of a Catalogue of Policy Measures (CPM) (global repository of more than 190 policy instruments), and a Selection Algorithm to generate a prototype action plan tailored to South Africa's mobility performance. The GRA 2.0 fully integrates the concept of transport system's resilience to a global pandemic and extreme weather events in the selection algorithm to generate a country action plan. South Africa is the first country that benefits from this upgraded version of the GRA (GRA 2.0).

The outcome of the application of those tools is illustrated in three papers:

- A high-level diagnostic of South Africa's transport and mobility system. This diagnostic takes a systemic approach, covering all modes of transportation, passenger and freight, infrastructure, and services. This paper is summarized in Appendix A (South Africa's Mobility Report: Tracking Sector Performances)
- A program of priority actions to improve the sustainability of the transport system and contribute to the attainment of the SDGs. This paper focuses on the "Action Plan." This Plan is informed by the performances of South Africa's transportation system.
- A diagnostic of South Africa's mobility system through the lens of gender, with priority policies to address the gender gap in transport.

Notes

1 The Global Tracking Framework for Transport is described in Annex 1: Elementary Global Tracking Framework for Transport, 95-102. In Sustainable Mobility for All. *Global Mobility Report 2017: Tracking Sector Performance (GMR).* Washington DC: Sustainable Mobility for All, 2017.

2 Sustainable Mobility for All. 2019. *Global Roadmap of Action Toward Sustainable Mobility*. Washington, DC.

3. Conceptual Framework and Methodology that integrate Mobility

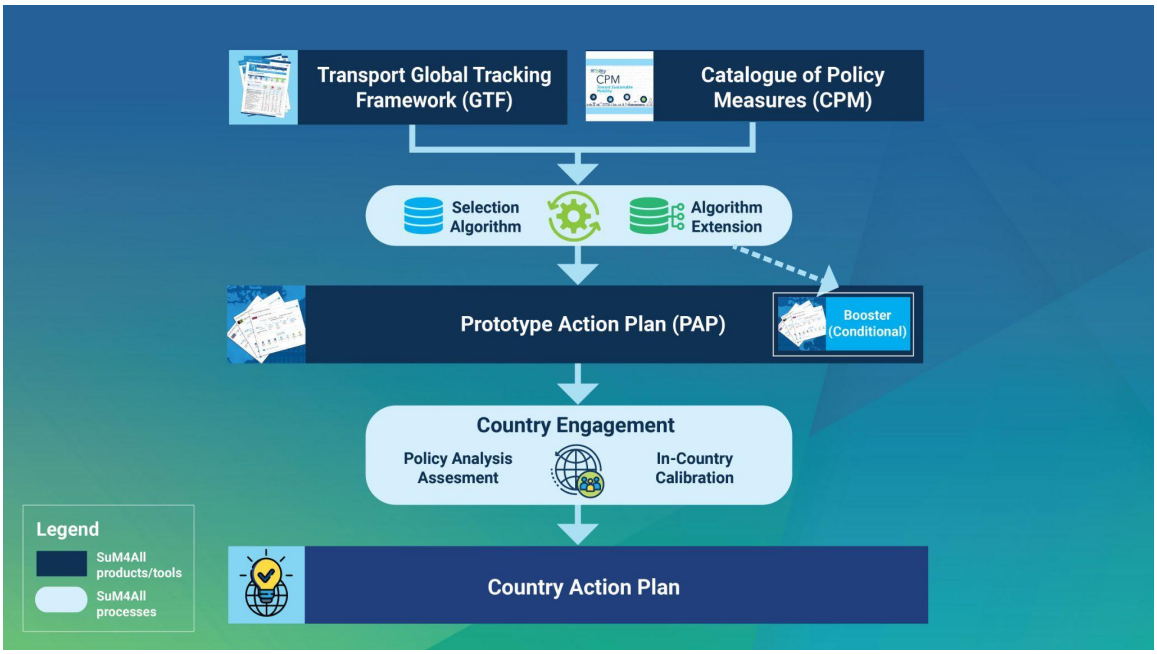
Achieving a systemic transformation of the sector will require a systemwide, integrated, mode-agnostic approach to transport and mobility. In the past, countries have designed strategies, policy programs, and action plans in transport with one policy goal in mind, and with a focus on a single mode of transportation. For example, they follow guidance from the "Road Safety Decade of Action 2011–2020" for inland transport, the International Maritime Organization's "Action to reduce GHG emissions from international shipping," and the ICAO's "Global Aviation Safety plan 2017–2019". Each of these plans recommends policies and investments that are specific to one mode of transportation and seek to advance on one Goal (safety or green mobility in the examples above). However, none of them consider choices among modes of transportation, and trade-off among policy goals. This fragmented approach has resulted in incremental progress on the transport sector, globally.

Over the last five years, SuM4All partners developed an innovative approach with a set of tools to improve decision making in transport. This approach combines the power of data to diagnose transport and mobility issues—using the *Global Tracking Framework for Transport*[1]—and the power of global policy knowledge from the *Catalogue of Policy Measures* (CPM) and the *selection algorithm*, to lay out policy options, and select the most impactful policy measures, respectively. A subsequent country engagement further refines those measures based on the local context through consultations with national bodies and local experts. This section describes the approach used to generate a country action plan, using data, global and local knowledge (figure 3.1).

This unique approach was outlined in the *Global Roadmap of Action (GRA) toward Sustainable Mobility*[2] and responds to concerns from countries to get structured policy guidance on trajectory changes in transport and achieving Sustainable Development Goals (SDGs) and the Paris Agreement Climate targets.

Several of those tools were upgraded during the COVID-crisis, as evolving realities of the pandemic entrenched South Africa and the rest of the world. The upgrade consisted of adding resilience considerations in the planning and design of transport systems to risks such as a global pandemic or climate change. This paper illustrates the application of the upgraded version of the GRA (GRA 2.0) to South Africa, as a case study.

Figure 3.1. New Approach for Improved Decision-Making in Transport, and set of Tools.



Source: Vandycke, N., Viegas, J.M. (2022). Responding to Changing Dynamics with a New Path Forward: Sustainable Mobility for All. In: Sustainable Mobility in a Fast-Changing World. Sustainable Development Goals Series. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-08961-9_8. Figure 8.1: Transport's new approach and its set of tools, Page 78.

This approach challenges the status quo in transport policy by providing the data, evidence, and methodology that identify and quantify gaps on sustainable mobility through an easy-to-understand and use medium. It also provides an objective and consistent approach to select policy priorities for countries, based on data and the best knowledge available globally. Consequently, the international transport community embraces a new paradigm on mobility with the adoption of these tools.

- Sustainable mobility stands at the centerpiece when advocating and identifying investment and policies. Traditionally, transport programs failed to capitalize on synergies between goals. For example, electrifying trains to improve system efficiency without cleaning up the grid overlooks potential synergies to achieve green targets. This fragmented approach resulted in incremental progress on certain facets of transport, but never in the structural transformation of the transport system.
- Explicitly recognize that country decision makers face difficult trade-offs that must be properly acknowledged and managed. For example, some countries decide to improve people's access to opportunities with a heavy program of road construction. Often, more roads have translated into an increased number of vehicles on the roads, with more traffic crashes, pollution, and carbon emissions. Promoting Decision making in transport policy is governed by mindfulness of far-reaching consequences for future generations. This innovative approach has put sustainable mobility at the core of its ambition.

Catalogue of Policy Measures (CPM)

The field of transport policy was organized and structured around modes of transportation until 2018 that highly specialized agencies used to conduct research and develop policy guidance. It follows that policy recommendations become constrained by transport mode. It was up to country decision makers to extract components from these specialized agencies' policy advice and ensure consistency in the overall program of policies and investments in transport. In practice, it often resulted in transportation mode hierarchies, with roads taking precedence over all other transport modes in most cases.

With the approval of higher-level goals for the wellbeing of the planet—SDGs and the Paris Climate Agreement, this siloed approach could no longer be sustained. Country decision makers were tasked to design policies and investments that achieved higher level goals—irrespective of the mode of transportation. To that end, they needed a global repository of policy knowledge that is mode agnostic.

SuM4All partners embarked on an effort in 2018 to crowdsource knowledge from specialized agencies to create a global repository of knowledge on transport policy. This effort was unique in both its size and process (figure 3.1).

More than 50 influential organizations and agencies sourced the most up-to-date information from their respective organizations. Each organization came to the table with their respective lists of policy recommendations they had been promoting in countries—for example, the International Association of Public Transport (UITP) on public transportation, the International Union of Railways (UIC) on rail, the United Nations Economic Commission for Europe (UNECE) on inland transportation and the International Road Federation (IRF) on roads. Approximately 180 experts then reviewed the list of policy measures, distilled the content, and developed a catalogue of policy measures, with each measure formulated at a similar level of granularity for comparability. This intense crowdsourcing effort resulted in an initial catalogue of more than 190 comparable policy measures.

The initial version of the catalogue was introduced, discussed, and opened to feedback from country and city decision makers, and private companies. This consultation sought to assess gaps, remedy them, and refine the initial catalogue and its formulation of policy measures. The partnership engaged with 25 private companies and more than 50 country and city decision makers in the transport and mobility ecosystem. The resulting catalogue consists of a coherent and integrated menu of policy measures to attain the SDGs and achieve the four policy goals that define sustainable mobility.

Policy measures refer to the means of intervention by governing authorities—government or public—in markets or society to promote certain policies to accomplish goals or solve problems. Given their intended general applicability, the description of these policy measures is made at a higher strategic level that often combines intermediate level goals such as production of planning instruments, with guidelines and activities that help advance a country's performance on sustainable mobility. "Develop an integrated national transport plan," "Integrate new mobility solutions to existing transport," and "Share knowledge on successes and best practices." are examples of this distinctive feature of policy measures.

The Catalogue of Policy Measures is categorized by: (i) toolboxes—regulatory and institutional, engineering and technology, economics and finance, and communications, and (ii) thematic areas within toolboxes. These classifications also helped ensure adequate coverage of the main types of policy interventions (table 3.1).

Table 3.1.List of thematic areas per Toolbox.

Toolbox Category	Thematic Areas
Regulatory and Institutional	• Plans and Strategies • Institutional Design, Cooperation, and Coordination • International Agreements and Regulations • Regulations for Transport Services • Regulations for Vehicles and Vehicle Use • Regulations for Data Collection, Data Sharing, and Data Use • Procurement and Contracts • Capacity Building and Human Resource Development
Engineering and Technology	• Technical Standards • Asset Construction • Design and Deployment of Transport Services • Design and Deployment of Programs and Initiatives • Asset Management • Safeguards
Economics and Finance	• Project or Program Cycle • Allocation of Public Funds • Fiscal and Financial Measures • Pricing for Efficiency and Inclusion • Innovation Policy and Enhancement
Communications	• Consultation and Public Engagement • Promotion Campaigns and Public Awareness • Knowledge Management and Dissemination of Best Practices

Source: Sustainable Mobility for All, Global Roadmap of Action towards Sustainable Mobility, 2019.

Prototype Action Plan (PAP)

Countries cannot consider implementing all 194 policy measures in the catalogue at the same time—nor would it be recommended given disparities in mobility performances. Thus, countries had to devise a structured approach to select the most impactful policy measures, linking this selection to country performances and gaps on the four goals identified in the diagnostic. To that effect, SuM4All partners developed a selection algorithm, which, when applied to the CPM generates a prototype action plan[3] for a country (figure 3.1).

This algorithm rests on a complex effort consisting of appraising each policy measure in the CPM by assigning scores, using multiple criteria of impact, country relevance, and resilience, and then selecting 30-35 of the most impactful policy measures for a given country. The resulting set of policy measures generate the initial prototype action plan (PAP).

Country Action Plan (CAP)

Policy measures in the PAP do not yet have the level of specificity and granularity needed to implement in the country or city. Moreover, they do not take specific political realities or microlocal context into consideration. The resulting PAP is considered as a starting point for further customization and refinement through engagement with relevant authorities, local experts, and other relevant stakeholders. This engagement will help refine the country's action plan to one more practically aligned with a country's needs and context.

This approach takes the view that a templated approach for decision making in transport is ineffective—policy and investment decisions should be tailored to countries' performances on sustainable mobility and reflect national priorities and realities. This step of confronting the PAP with the country's reality is fundamental to ensure that the action plan is credible, grounded in the context of the country's political economy, and bears a realistic chance to be implemented (figure 3.1).

A deep-dive analysis of each policy measure in the PAP then follows with relevant authorities and other parties. The status and implementation of each policy measure in the PAP are assessed by a standard set of metrics—country relevance, alignment with national priorities and national transport strategy, the level of adoption and implementation, and barriers to implementation. A second parallel process of in-country calibration is conducted to gather input from national bodies and local experts on political and economic considerations that have an impact on feasibility (figure 3.1).

The country's engagement process helps customize the action plan and provides granular information for its implementation and about obstacles that potentially prevent or slow down implementation. This engagement is essential to ensure that the action plan adds value to a country's ongoing policy-making process and to influence policy choices—both in terms of future investment projects and policy reforms. This process driving toward further practical alignment with local conditions and preferences is critical to the success of the roadmap of action's impact in implementation.

Finally, it is important to note that implementation of a country action plan is not sufficient to reach sustainable mobility for most countries in the world. Systemic improvements in a country's transport system will require sustained country's efforts on the policy and investment sides. Most often, a series of action plans will have to be deployed to progress over time toward the end goal. Action plans will need to be iteratively implemented and redefined in partnership with national and local authorities to consider national priorities, political environment, and be embedded as part of a broader national roadmap of action toward sustainable mobility.

Notes

1 The Global Tracking Framework for Transport is described in Annex 1: Elementary Global Tracking Framework for Transport, 95-102. In Sustainable Mobility for All. *Global Mobility Report 2017: Tracking Sector Performance (GMR)*. Washington DC: Sustainable Mobility for All, 2017. Read more: Sehmi, G. S. 2020. *"How Can We Track Progress Toward Sustainable Mobility?"* Transport for Development. World Bank, January 23, 2020. Blog. Retrieved from: https://blogs.worldbank.org/transport/how-can-we-track-progress-toward-sustainable-mobility

2 Sustainable Mobility for All. 2019. *Global Roadmap of Action Toward Sustainable Mobility.* Washington, DC. www.SuM4All.org/gra

3 https://www.SuM4All.org/gra-tool/interactive-tool.

4. South Africa's Prototype Action Plan

The mechanistic application of the Selection Algorithm to the Catalogue of Policy Measures generated a prototype action plan (PAP). South Africa's PAP comprises a nominal set of 31 policy measures tailored to respond to the country's transport performance (table 4.1).

Table 4.1.South Africa's Prototype Action Plan.

Universal Access Focus	
Policy Measure	**Brief Description**
1. Make public transport fares affordable for the poor.	Apply means-tested approaches to ensure cost-recovering mechanisms.
2. Improve the quality and safety of public transport.	Improve the quality and safety standards of public and private, as well as formal and informal public transport operations such as service frequency, reliability, cleanliness, and safe driving practices. Implement bus lanes and other bus priority measures.
3. Consult with stakeholders during the full project cycle.	Consult extensively with stakeholders during project formulation and establish a framework for continuous consultation during project implementation.
4. Expand public transport infrastructure.	Expand the public transport network adjusted to demand requirements, with an emphasis on equitable access. Consider the most appropriate modes in each context—bus, rail, demand-responsive service, cable-propelled transport and ferry transport.
5. Implement anti-harassment campaigns in public transport.	Implement anti-harassment awareness campaigns in public transport spaces.
6. Develop mobility plans at the subnational level.	Develop a sustainable urban mobility plan and implement strategies at the subnational level that are consistent with the integrated national sustainable transport plan.
7. Adopt sanitary protocols and reduce crowding in passenger transport.	Adopt special protocols in crisis response to events such as pandemics that safeguard the health and security of transport services, disinfection and distancing measures for passenger transit, as well as screening and quarantining measures for international travel.
8. Implement smart and contactless fare collection systems.	Administer smart and contactless fare collection systems by smart card, credit card, and mobile phone because they generate numerous benefits to public transport and other means of transport and are helpful in preventing human-to-human contact and the exchange of cash during pandemics.
9. Ensure access to transport services in underserved areas.	Ensure complete transport services by extending services to underserved areas and populations.

10. Set design standards for sidewalks and bicycle paths.	Set high quality design standards for sidewalks and bicycle paths; for example, safe and convenient pedestrian crossing and adequate street lighting, which would ensure accessibility to persons with disabilities. Consider gender sensitive aspects for example, dropped curbs at crossings, size of refuge islands, and timing of traffic signals.
Safety Focus	
Policy Measure	**Brief description**
10. Set design standards for sidewalks and bicycle paths.	See the description for the same policy measure in the above category of universal access. Note: by design, policy measures can impact several policy goals.
11. Define laws for key safety rules.	Define standards and compliance regimes for key safety rules for example, the use of seat belts and crash helmets for drivers and passengers, child restraints, driving without alcohol or other drugs or fatigue, driving without distraction, restrict the use of mobile phones while driving, and consider the needs of women and vulnerable groups in transport and mobility.
12. Establish a state aviation safety oversight system.	Establish and implement a state safety oversight system in line with the ICAO global aviation safety plan (GASP) objectives. Progressively adapt them into more sophisticated means of managing safety.
Efficiency Focus	
Policy Measure	**Brief description**
13. Plan for integrated multimodal networks.	Plan for the optimal location of transport corridors, linear facilities, and hubs from a multimodal network perspective, based on the analysis of freight origins and destinations, and a rail network development plan.
14. Remove non-tariff barriers for international trade.	Remove non-tariff barriers for cross-border traffic and barriers for rail and waterborne transport.
15. Build complete multimodal networks.	Build complete multimodal networks ensuring optimal network operational availability.
16. Accede to and implement international conventions.	Accede to and implement relevant international agreements and conventions that address one or more policy goals; for example, the TIR Convention, the WTO Trade Facilitation Agreement, or core road safety-related UN legal instruments.
17. Harmonize construction standards along corridors	Adopt construction standards so that assets are created using accepted, up-to-date harmonized standards and regulations, across borders, within regions, and along transport corridors.
18. Identify risks and vulnerabilities to extreme weather events.	Conduct risk appraisal and impact quantification of failures and disruptions due to extreme weather events, identifying the most vulnerable transport links.
19. Require service providers to report standardized data.	Establish standardized data reporting requirements for all transport service providers, transportation network companies (TNC), public transport operators, and bike- or car-share companies.
20. Remove barriers to intermodal interoperability.	Remove regulatory barriers to improve interoperator and intermodal operability across transport modes.

21. Develop asset management standards and plans.	Develop asset management standards and plans to preserve, maintain, and manage transport infrastructure and their systems over their life cycle.
22. Use a robust framework for project prioritization.	Use a robust investment evaluation framework to prioritize the allocation of public infrastructure funding to infrastructure projects and associated services.
Green Mobility Focus	
Policy Measure	**Brief description**
23. Set and implement climate change adaptation standards.	Set climate change adaptation and resilience standards and practices, and integrate them into project design across transport infrastructure, including roads, airports, and seaports.
24. Build rail and maritime transport infrastructure.	Build infrastructure for energy and space-efficient modes such as rail and waterborne transport, and high-speed rail for corridors with sufficient demand.
Cross-Cutting Policy Measures (Impact scores of 3 across all policy goals)	
Policy Measure	**Brief description**
25. Develop an integrated national transport plan.	Develop and implement an integrated national transport plan to cover the four policy goals, all modes of transport, and passenger and freight traffic.
26. Facilitate capacity building at the International level.	Facilitate sector-specific capacity building at the international level.
27. Coordinate planning across government agencies.	Coordinate across agencies to ensure integrated planning and shared responsibility for results across levels of government, jurisdictions, and agencies, including but not limited to the coordination of road safety responsibilities and the coordination of response to extreme weather events.
28. Leverage innovative forms of mobility during crisis response.	Emerging transport innovations have important roles if not yet mainstream and may be leveraged during crisis response, for example, automated vehicles and drones are among the current technologies with most potential.
29. Share knowledge on successes and best practices	Share successes and best practices with other agencies at the local, national and international level, based on a well-designed knowledge transfer framework.
30. Develop data repositories and data collection guidelines	Develop centralized data repositories and establish data collection guidelines at the national and metropolitan levels, and facilitate data access to different stakeholders—academics, private sector—while establishing a legislative framework defining the context and purpose of its use.
31. Build capacity across levels of government	Build national and local capacity across levels of government, jurisdictions, organizations, and modes, including providing training and information resources.

Source: Original to authors, drawn from the Sustainable Mobility for All Policy Decision Making Tool 2.0 [URL: https://www.SuM4All.org/online-tool]

5. South Africa's Country Action Plan

By design, the policy measures contained in the PAP are at a generic level. Decision makers require it contextualized locally with added granularity to transcribe a PAP that can guide and enable action. Moreover, to transform this intelligence into country action and impact, an important additional step involves the input and validation from local transport experts and country decision makers in creating a country action plan (CAP).

The policy-by-policy analysis assessment involves a systematic analysis of each of the 31 policy measures in the PAP for effectiveness by local transport experts in South Africa. Criteria for policy assessment includes: country relevance, alignment with national priorities and national transport strategy, the level of adoption and implementation, barriers to implementation, public resources, governance and institutional capacity, and the process for monitoring and evaluation. The policy measure "Ensure complete transport services by extending services to underserved areas and populations" in the PAP serves to illustrate the type of analysis conducted at this stage (table 5.1).

Table 5.1. Metrics of Policy Analysis - Example Policy Measure "Ensure complete transport services by extending services to underserved areas and populations."

Criteria	Rating System	Comments
Is the policy relevant for South Africa?	Yes	Yes, many residents spend too much on travel for more than an hour to reach their destinations.
Is the policy in place?	Yes	The Public Transport Strategy calls for Bus Rapid Transit services (BRT) to provide frequent and reliable services as well as priority infrastructure investments. The Medium Term Strategic Framework calls for expansion of integrated public transport networks in cities, support for transit-oriented development (ToD) and improved services levels. The Medium-Term Strategic Framework commits to private sector participation in the modernization of the urban rail network and system and upgrading of Metrorail.
What is the level of implementation? (Scale 1-5)	2	Not all urban metros have operational BRT systems. Passenger Rail Agency of South Africa's urban rail services have deteriorated in the past decade.
What are the barriers to implementation?	Subjective	Roles and responsibilities not aligned with urban development mandates. Spatial characteristics of cities and transport demand reflect low densities and long distances. Funding constraints arise from low level of affordability and a lack of prioritization of mass transit investment in urban metros. Specifications and technical norms and standards may have been set too high to allow for a broader roll-out of services.

Are public resources appropriately allocated to this policy?	Yes	R24.9 billion is allocated per year. Urban rail receives 53% whilst BRT and conventional bus services receive 45% of that allocation.[c] A small portion of public transport allocations (2%) support the taxi recapitalization program.
What is the level of sustainability (financial, budget resource, and other) of this policy? (Scale 1-5)	2	The level of public transport, although under pressure from other priorities such as healthcare, is sustainable if service performance is improved. For the number of passengers served by both rail and bus services, expenditure levels are not equitable.
If this policy must be adopted, when should this be?	Short term	Public transport policy should be differentiated by areas, and size of cities.
What are the prerequisites for the adoption of this policy?	Subjective	Consultation between the Department of Transport, National Treasury, Department of Cooperative Governance, South African Local Government Association and the Financial and Fiscal Commission and other spheres of government.
Which other policies should complement this one? (Consider synergies and tradeoffs)	Subjective	Urban rail legislation, develop mobility plans at subnational level to provide for the planning, management, and funding of integrated public transport networks. Public transport subsidy policy should improve the affordability of services.
How effective is this policy relative to each policy goal? (Scale 1-5)	3	Upgrading urban rail to ensure regular services will improve access, if combined with feeder services. If provided in an affordable manner, BRT services linking underserviced areas can increase efficiency levels due to the high demand for public transport. Safety levels should increase with the use of dedicated rights of way services in which security concerns are addressed. Mass transport, if used, will reduce carbon emissions.
Is governance in place to support the success of this measure?	No	Policy inertia related to public transport roles and responsibilities created uncertainty in the governance of this sector.
Is there a regular assessment to support the success of this measure?	Yes	Urban metros have processes in place for monitoring and evaluation of service expansion and as well as contract management for private partnerships. Rail infrastructure audits and regional expenditure review would support the upgrade of rail services.
Is the policy already embedded in South Africa's strategic development plans (National Transport Master Plan/ Green Transport Strategy)?	Yes	The 2019 – 2024 Medium Term Strategic Framework[b] targets the expansion of integrated public transport networks in cities, and support for transit-oriented development, calls for the downscaling of BRT specification and technical norms and standards, and improved services levels.

Is there sufficient institutional capacity to facilitate and coordinate implementation of this policy measure?	No	Public–private partnerships would add capacity to upgrade and revise urban rail.
What are the unintended effects (if any) from the implementation of this policy? Are there mitigation strategies?	Yes	Investment in public transport networks over long distances in low density areas may facilitate urban sprawl, reduce urban agglomeration, and increase emissions. Land use solutions and urban modal development may have better green technology and safety outcomes.

Notes:
a. Department of Transport, Public Transport Strategy and Action Plan, 2007.
b. Presidency, 2019 – 2024 Medium Term Strategic Framework, Comprehensive Report.
c. National Treasury, Supplementary Budget Review 2020, 24 June 2020.

Source: original to the authors

To this point, the process of diagnosing South Africa's mobility issues and elaborating an action plan has been rigorous and objective, using data, solid methodology and global knowledge. However, the approach used was mostly top-down, leaving little room for political economy considerations and other subjective aspects.

An important final step involves the country's decision-maker (i.e., relevant authorities). He/she will have to evaluate each measure based on a combination of factors, including the enabling political environment, financial considerations, and political savviness. That person will assess the authorizing environment for policy reforms and investment programs against a set of questions: in the prevailing socio-economic and political context, which measure has the greatest probability of getting political support—nationally and internationally? Which measure will generate the most immediate impact? Can this measure be properly implemented, and under which condition? What will it cost? How many of those measures can realistically be pushed now?

With the PAP at hand, and the policy assessment, it will be essential to engage with the relevant authorities in the process of refining and generating the country's action plan. This collaborative process of engagement, validation, and refinement will increase the chances of commitment and implementation.

When the policy analysis assessment and in-country calibration are considered together, it became clear that the priority should be given to optimizing the utility of existing infrastructure assets first (e.g., develop mobility plans at subnational levels, including land use planning; develop asset management standards, and maintaining the strategic road network), and where warranted, and on a case-by-case basis, consider new investments (e.g., building complete multimodal freight networks, removing barriers to intermodal interoperability and investing into intermodal operability). All policies and investments in the action plan should be geared towards improving the quality of South Africa's transport system—that is resilient and Paris aligned (e.g. accede to and implement international conventions, set and implement climate change adaptation standards).

A detailed assessment of each policy measure is included below:

Make Public Transport Fares Affordable for the Poor (as applied to both public transit and privately operated taxi fleets) [Policy 1]

Transport services are vital to the economy and interact with people and businesses every day. Because transport is needed by everyone, every day, it must be available to everyone, every day, including poor or vulnerable users. Governments must develop support for access for low- income or vulnerable users of transport services. Such support would mean concessionary fares, other fare discounts, and integration of fares into the broader social welfare framework.

Due to South Africa's extremely high level of income inequality, most users of public transport in South Africa are poor. The transport system should ensure that public transport is affordable for all commuters relative to their disposable income. It should also provide an appropriate and affordable standard of accessibility to work and to commercial and social services in urban and rural areas, while limiting walking distances to public transport to less than approximately one kilometer in urban areas. The objective to increase the affordability is supported by a policy[1] that sets the goal of reducing the cost of public transport to below 10 percent of household income.

Based on global experience, a strategy to consider includes: (i) improve the safety and security of public transport while increasing affordability to attract commuters to rail and reduce household costs; (ii) subsidize transfers to rail to attract passengers; and (iii) aim to shift revenue derived from passengers to all who benefit from expanded and improved rail provision.

Improve the Quality and Safety of Public Transportation [Policy 2]

Improve the quality and safety standards of public and private as well as formal and informal public transport operations, such as service frequency, reliability, cleanliness, and safe driving practices, and implement bus lanes and other bus priority measures.

South Africa is not on track to reach its own target set to halve road fatalities by 2030. Recent legislative changes may provide the impetus to motivate changes in driver behavior and strengthen enforcement. The introduction of the points demerit system in the *Administrative Adjudication of Road Traffic Offences Act, 1998* provides administrative penalties to repeat road offenders.

The safety, security, and quality of service of other modes of transport are below acceptable levels. Rail safety should benefit from particular attention as improved safety and security are critical prerequisites to shift traffic from road to rail. Safety measures should protect the rail system from theft and vandalism of rail assets and rail goods in transit. Such achievements will enhance the competitiveness of South African industry and boost the quality of life of its citizens.

Based on global experience, a strategy to consider may include: a differentiated approach where dedicated infrastructure investments in support of integrated public transport networks are supported in urban metropolitan municipalities; and public–private partnerships to support reinvestment in infrastructure and provide reliable, frequent, and safe rail services.

Consult with Stakeholders during the Full Project Cycle [Policy 3]

Consult extensively with stakeholders during project formulation and establish a framework for continuous consultation during project implementation.

In South Africa, the principle of cooperative governance and consultation between spheres of government is provided for in the Constitution. Consultation with those impacted on by public transport policies is one of the *Batho Pele* principles[3] The *Municipal Systems Act, 2000* requires public servants to make sure that they stay in touch with the people they serve, by finding out services they need, modes of such delivery, and the sources of dissatisfaction. Consultation is meaningless, unless it is fed back to the management so that they can change the system, or take the steps needed to improve the service given to the customers.

Based on global experience, a strategy may include public consultations conducted on plans, long-term contracts, budgets and performance information. Public transport planning would benefit from these processes being implemented in practice.

Expand Public Transport Infrastructure [Policy 4]

Expand the public transport network adjusted to demand requirements, emphasizing equitable access and considering the most appropriate modes in each context of bus, rail, demand-responsive service, cable-propelled transport, and ferry transport.

The South African 2019–2024 MTSF[4] calls to expand integrated public transport networks in cities, support transit-oriented development and improve services levels. Local governments have been extending their public transport networks to varying degrees and an infrastructure gap remains in some urban metros with large populations and remote rural areas. Investment in rapid transit infrastructure for BRT and urban rail will only be financially viable in limited areas. For example, metro areas in the Gauteng Province and the City of Cape Town suffer from road congestion levels that point to the value of investing in dedicated transport infrastructure.

From global experience, first-mile and last-mile access are major demand factors for public transport. Rapid transit investments may not necessarily lead to increased accessibility owing to the dominance of minibus taxis and should be evaluated in land use options.

Implement anti-harassment awareness campaigns [Policy 5]

Sexual harassment toward women, whether they are walking on the streets, taking buses, or riding trains, is a major problem in both developed and developing countries. The fear of harassment in public spaces not only limits women's and girls' mobility but consequently limits their access to other services especially jobs, health care facilities, and education.

The NDP aims that by 2030, people living in South Africa should have no fear of crime when using the transport system. Access to safe public transport is essential for women, particularly those who reside in under resourced communities, to access economic opportunities without discrimination, as provided for in the *Promotion of Equality and Prevention of Unfair Discrimination Act*. Such laws are not fully implemented, for example, in by-laws, and fear of harassment remains a barrier to women's mobility and access to public transport. According to the South Africa National Household Travel

Survey of 2020, 37.2 percent of public transport users are dissatisfied with the behavior of the taxi drivers toward passengers and 17 percent are dissatisfied with the behavior of bus drivers. Most rail passengers, 70.6 percent, are concerned about security on the walk to and from the station, security at the train station concerns 57.7 percent and security on the train bothers 65.3 percent. The *National Land Transport Act, 2009* specifically provides for the safety of passengers.

Based on global experience, a strategy to consider may include: (i) greater safety and security coordination and the devolution of function to local government and police; (ii) improved availability of reliable statistics on sexual harassment[5] on transport services; (iii) transport planning implementation, safety plans and transport service design such as woman and children only coaches; (iv) advocacy on the impact of harassment required in engagements with transport operators and commuter organization. Addressing harassment will always make public transport more accessible for all users. Greater efficiency in providing access to and from transport stations will reduce the opportunities for harassment. Perceptions of safety will improve with visible policing and reduced harassment. Women who feel safe to use public transport may reduce private car use and related emissions.

Develop Mobility Plans at the Subnational Level [Policy 6]

Granularity is crucial in transport planning, monitoring, funding, and evaluation. This entails developing a sustainable urban mobility plan and implementing strategies at the subnational level that are consistent with the integrated national sustainable transport plan.

Based on global experience, a strategy to consider may include that local governments be given more policy clarity and autonomy to plan, manage, and regulate public transport services. Local plans could improve services, increase access, enhance affordability and improve land use management. For example, efficiency could be improved by aligning urban and town planning to transport planning; Metro, police, and community safety forums could increase transport safety; and road accident monitoring and publication at municipal or city level can improve transport network planning. Local planning and autonomy may also improve the extent of transport network coverage attracting private transport users to public transport and reducing emissions. Rural and periurban planning would prioritize needs such as mobility plans that support access to bicycles and safe cycling paths and additional beneficial investment required that make public transport affordable.

Adopt Sanitary Protocols and Reduce Crowding in Passenger Transport [Policy 7]

Implement special protocols to safeguard health and security of transport services and disinfection and distancing measures for passenger transit.

The National Coronavirus Command Council was set up to support governance in response to the COVID-19 pandemic. The impact on the transport sector of COVID-19 was significant. The COVID-19 pandemic experience showed that low levels of restriction impacted willingness to use public transport services, with a marked decline in passenger numbers even after lockdown restrictions were lifted. Social distancing protocols—if improperly designed and enforced—increase the risk of transmission of viruses, thus increasing safety concerns.

Based on global experience, a strategy to consider may include better design and enforcement of regulatory provisions for users of public transport during a pandemic to mitigate the transmission of viruses. This is especially pertinent for countries where most commuters use informal public transport, such as minibus taxis. Options to mandate vaccinations should be considered to protect against the worse effects of the pandemic while allowing economic activity to recover. The poor, vulnerable and marginalized must always be cared for— absence of such measures will undermine any post-pandemic reconstruction.

Implement Smart and Contactless Fare Collection Systems [Policy 8]

Smart and contactless fare collection systems, including by smart card, credit card, and mobile phone, generate numerous benefits to public transport and other means of transport and are helpful in preventing human-to-human contact and the exchange of cash during pandemics. Cashless systems increase efficiency and reduce travel times and inconveniences for transfers. Such systems reduce fare evasion. Cashless systems increase safety for passengers from a crime perspective as well as a contactless system. One of the activities in the National Department of Transport's Strategic Plan for 2020–2025[7] is to pilot an integrated fare system across public transport modes. Local government is responsible for automated fare collection provided for in the National Land Transport Act, 2009. Cities of Cape Town, Ekurhuleni, George, Johannesburg, and Tshwane run automated fare collection systems. Gautrain uses an account-based system. Private transport operators use in-house systems.

Based on global experience, a strategy to consider may include: (i) ensuring systems requirements should be kept to a minimum and provide standards that ensure interoperability supporting innovation and competition in the supply of systems in sustainability; (ii) agreement between transport operators on interoperability requirements; (iii) awareness campaigns to support users to understand the use of the AFC and information centers to support uses with queries or complaints.

Ensure access to Transport Services (including economic and social opportunities) in underserved areas [Policy 9]

Ensure complete transport services by extending services to underserved areas and populations. Underserved, poor communities often live in outlying urban areas, impacting their transport. Commuters there are served by minibus taxi services despite the higher costs of these services when compared to mass transit forms.

Global experience has shown that support for the expansion of the public transport networks in urban metros to poorer areas requires prioritization of urban metros to support areas characterized by higher population numbers, greater employment, and economic growth. To ensure services are affordable, a review of the norms and standards is key. Intermodal network services will also be necessary to make transport affordable, with conventional bus and MBT supporting BRT and rail services.

The revival of urban rail, which serves poorer users, could provide lower cost transport options, and should be considered. However, in many cases improved accessibility does not require additional transport investments but urban development and land use management solutions, which ensure that social and economic opportunities are provided in underserviced areas.

Set Design Standards for Sidewalks and Bicycle Paths (to Facilitate Adding Sidewalks and Paths as Standard Parts of Road Upgrades) [Policy 10]

Set high quality design standards for sidewalks and bicycle paths, for example, safe and convenient pedestrian crossing and adequate street lighting that is accessible to persons with disabilities and consider gender sensitive design aspects such as dropped curbs at crossings, size of refuge islands, and timing of traffic signals.

In South Africa, many residents walk all the way, and most people walk part of the way to reach their destinations. Walking all the way was the primary method used by scholars to reach their school for 63 percent. This pattern is also true for disabled scholars at 63.8 percent.[10, 11] Given that the largest component of road injuries and fatalities are pedestrians, it is vital that design standards be developed to reduce pedestrian fatalities.

Based on global experience, a strategy to consider may include ensuring that sidewalks in rural areas are both sealed and wide. These standards should cover construction and maintenance standards and focus on labor-intensive work methods. This requires that materials used in construction of sidewalks be amenable to routine maintenance without sophisticated machinery. However, it is also important that these design standards extend beyond sidewalks and bicycle paths to include roadways. Research highlights the economic benefits of an optimal national road surfacing policy for low volume roads.[13] Not only would this generate significant long term budget savings for road departments, but the shift from capital-intensive gravel roads to labor-intensive sealed roads could generate approximately 7.1 million full-time equivalent job opportunities, with most of these jobs located in rural provinces with the highest levels of unemployment.

Define Laws for Key Safety Rules [Policy 11]

Safer public transport services attract greater users increasing access for all. Lower road accidents improve transport efficiency and lower the cost of transport accidents in the economy. Greater transport safety also frees societal resources to address the needed energy transformation and climate adaptation needs. Safer transport starts by defining standards and compliance regimes for key safety rules, for example, the use of seat belts and crash helmets for drivers and passengers, child restraints, driving without alcohol or other drugs or fatigue, driving without distraction, restrict the use of mobile phones while driving, consider the needs of women and vulnerable groups.

The *Road Traffic Act* provides road use rules and requirements. Amendments to the Act have been proposed with a zero-tolerance provision on alcohol tabled in Parliament to address road fatalities and accidents. The *Administrative Adjudication of Road Traffic Offenses Act*, 1998 has not provided an implementation date, however, it is understood that the Act will come into operation on 1 July 2022.

Based on global experience, strategies to consider may include better enforcement of existing safety legislation and regulation, for example, by leveraging technologies such as vehicle tracking devices that allow for greater enforcement without additional capacity or human capital requirement. See also policy 16 for discussion on implementing conventions, including road safety.

Establish a State Aviation Safety Oversight System [Policy 12]

In general, air travel makes up a small proportion of traveling in South Africa. However, 6.4 percent of business trips are undertaken by aircraft, and these are more prominent in provinces with higher economic activity such as Gauteng and Western Cape or in provinces with low levels of mobility, namely, Northern Cape. Overnight trips are non-business related, and 4.3 percent of these are made by aircraft. Investment in the aviation sector therefore has a lower marginal impact on overall mobility.

South Africa is a signatory to the Chicago Convention of the International Civil Aviation Organization. The white paper on national civil aviation policy was published by the Minister of Transport in 2017. Civil aviation security oversight is governed in terms of the *Civil Aviation Act*, 2009 which gives effect to the Tokyo Convention, the Hague Convention, and the Montreal Convention. The National Aviation Security Programme addresses the security related responsibilities of the operator of designated airports, the Air Traffic Navigation Services Company, any air carrier, and any other aviation participant. The Department of Transport allocated R504 million toward aviation policy and regulation, safety and security, economic regulation, and oversight in 2021–22. The Airports Company of South Africa budgeted R31 million for safety and security in South African airports in 2021–22. The South African Civil Aviation Authority budget for 2021–22 is R715 million dedicated to safety and security. The South African Civil Aviation Authority is responsible to oversee the implementation and compliance with the National Aviation Security Programme. In 2019–20 the SACAA (SA Civil Aviation Authority) conducted 279 infrastructure safety inspections, 1453 operations safety inspections and 1232 aviation security inspections.

Based on global experience, strategies to consider include, establishing and implementing a state safety oversight system in line with the ICAO global aviation safety plan (GASP) objectives and progressively adapting them into more sophisticated means of managing safety.

Plan for integrated multimodal networks [Policy 13]

Intermodal transport networks are important across passenger modes—BRT, rail, bus, metro, and active mobility—and are also important for freight at ports, rail and for trucking. Urban transport networks that incorporate the most efficient mode for specific services and integrate these into a single network—which supports transfers—helps achieve this objective.

Based on global experience, a strategy to consider includes planning for the optimal location of transport corridors, linear facilities, and hubs from a multimodal network perspective, based on the analysis of freight origins and destinations, and a rail network development plan. It is essential that this is informed/supported by the robust framework for project prioritization and includes analysis that incorporates urban development and land use management. Investment and asset maintenance options need to be considered to ensure value for money. Urban mobility will benefit from multimodal public transport networks, however, there needs to be a differentiation between metropolitan municipalities, where congestion requires significant infrastructure investment to offset against travel time and operating cost impacts, and other municipalities that may not need BRT systems because they don't have the same congestion related challenges. In addition, integrated public transport networks can only be viable if aligned and use management strategies that ensure corridor densification. Such networks reduce the cost of public transport services and urban nodal investment, which would decrease the need and distance that residents travel.

Remove non-tariff barriers for international trade [Policy 14]

Remove non-tariff barriers for cross-border traffic, including barriers for rail and waterborne transport. This policy may reduce costs, simplify procurement, and decrease delivery waiting times that would improve accessibility. However, barriers to implement this policy include concerns of unfair competition due to international subsidies or different regulatory requirements. Low skill levels, high unemployment and poverty levels require a sensitive approach to lowering non-tariff barriers.

Some research has indicated that these barriers have not resulted in economic and social benefits. The development of the auto and auto components sector has been the primary target of South Africa's industrial policy. A study[1] indicates that policy objectives of increasing production, deepening local content, and increasing employment have not materialized despite the intentions and investment in the industrial policy. Clarity is essential on the cost and impact of existing protection measures, subsidies, and localization requirements. It would aid greater understanding on the import or export dynamics of the economy as well as investment flows.

Other non-tariff barriers to trade associated with transport result from failure to harmonize vehicle and driver safety, and risk standards and specifications with neighbouring countries. This issue should be considered as an aspect of other policy actions (Policy 11, 17 and 21 of this section).

Build complete multimodal networks (including freight) [Policy 15]

Build complete multimodal networks ensuring optimal network operational availability. The National Land Transport Strategic Framework, 2017–2022[16] envisages that transport infrastructure and operations form an integral part of land use management. The framework acknowledges the shortcomings of the Public Transport Strategy, 2007 and calls for greater efficiency and consideration of all modes in different spatial typologies.

From global experience, ensuring multimodal use increases sustainability because: (i) the more appropriate mode can be used to create a full network with convenient transfers; (ii) limit the need for passenger and freight infrastructure investment; (iii) allow for investment in response to demand; and (iv) enhance flexibility for modes to access BRT lines and rail stations.

Accede to and implement international conventions [Policy 16]

Accede to and implement relevant international agreements and conventions that address one or more policy goals, for example, the TIR Convention, the WTO Trade Facilitation Agreement, or core road safety-related UN legal instruments.

South Africa became a signatory to the Paris Climate Agreement and has committed to reduce its contribution to climate change through emission reductions. South Africa is also a signatory to the following conventions relevant to urban mobility: the *1968 Vienna Convention* ratified in 1977[17] facilitates international road traffic and increases road safety through the adoption of uniform traffic rules; and the *1958 Geneva Agreement on Uniform Technical Prescriptions*, which South Africa ratified in 2001 supporting uniform technical prescriptions on wheeled vehicles. The *Road Traffic Act 1996*, as amended, provides for these international agreements as they pertain to road safety.

Based on global experience, a country will only implement an international agreement once approved by Parliament and provided for in local legislation. Once this criteria is satisfied, implementing existing international treaties using advances in Information and Communication Technology (ICT) can improve compliance and enforcement.

Harmonize construction standards along corridors [Policy 17]

Adopt construction standards so that assets are created using accepted, up-to-date, harmonized standards and regulations, across borders, within regions, and along transport corridors.

The South African Bureau of Standards is tasked to ensure components and systems produced by the building and construction industry comply with the relevant standards. The Committee for Transport Officials also publishes standard specifications for road and bridge works for South African road authorities. South Africa is the regional leader in road standards and specifications. Therefore, while these technical standards are applied locally, their application across borders is an exogenous or political factor. For example, countries that do follow South African standards like Namibia, do so under discretion.

Based on global experience, closer engagement and collaboration with other road departments or governments to facilitate sustainable mobility and the adoption of road construction standards could bring wider benefits, for instance, enhancing safety, stable operating environment for drivers, and cost reduction in construction with the adoption of standard equipment and procedures. This would in turn increase productivity and decrease errors.

Identify risks and vulnerabilities to extreme weather events [Policy 18]

South Africa is vulnerable to drought, sea surges, and sea water rises as well as flooding. Moreover, certain regions in South Africa—especially KwaZulu-Natal and Mpumalanga—are subject to tropical cyclones. High rainfall exacerbates the road maintenance costs for gravel roads. Climate—within which moisture is the most relevant variable to gravel road surfaces—is the most important influence on the durability of natural road materials in South Africa.[20] The gravel wearing layer may be eroded through intense rainfall in forms such as sheetwash, riling, and gullying. The gravel wearing layer may also decompose or disintegrate in areas with elevated levels of precipitation. Moreover, frequent flooding events compound the importance of all-weather road access to schools to protect students' lives and their constitutionally protected right of access to basic education.[21–24]

The National Climate Change Adaptation Strategy[18] calls for sector plans to include climate change adaptation. This will involve ensuring that key sectors have drafted updated national climate change sector plans. While robust evidence shows that pre-emptive upgrades of roads, by adapting the design and changing the material used, can save money eventually, most road construction models assume a stationary climate, based only on historical data for regional climates in South Africa. The main problem for most authorities concerns financing pre-emptive adaptation, particularly given the high cost of road construction and maintenance. The benefits from adapting road infrastructure proactively include: (i) direct savings linked to decreased maintenance on unpaved road infrastructure; (ii) decreased vulnerability to climate change impacts; and (iii) a more robust and reliable road infrastructure and indirect savings linked to fewer disruptions in economic activity.

Based on global experience, a strategy to consider entails early preventive maintenance, which would be crucial in managing the cost of climate change on South African roads and rail infrastructure. Conducting risk appraisal, impact quantification of failures and disruptions due to extreme weather events and identifying the most vulnerable transport links are examples of activities to support this. Additionally, developing asset management systems that facilitate preventive maintenance to extend the lifespan of rail and road assets and to reduce vehicle operating cost.

Require service providers to report standardized data [Policy 19]

Establish standardized data reporting requirements for all transport service providers—transportation network companies (TNC), public transport operators, and bike- or car-share companies.

As part of the legislated development of an integrated development plan, municipalities are required to develop their strategic planning of their five-year municipal integrated transport plans (ITPs) that provide for the contract management and regulatory functions. These plans call for specific data on routes and services, which are weak for most service providers, specifically the informal minibus Taxis.

Global experience has shown that while much data is being collected by freight operators, they are not shared with the National Departments of Transport and other provincial transport authorities. SuM4All's **"GRA in Action Series report on data sharing"** between private and public sectors recognizes that many disruptive mobility businesses are built on the backbone of advanced data collection, processing, and use capabilities.[25] Data create awareness and open new avenues for dialogues. Increasing digitalization of these data opens new possibilities. Development of a sound policy framework, which protects commercially sensitive data, while enabling data sharing between public and private sectors, helps achieve sustainable mobility goals and facilitates the decarbonization of transport.

Based on global experience, a strategy to consider should entail collection of standardized data. For example, public transport operators could install a tracking device that allows for collection of standardized information. Standards must be established for devices that can be used and the need for data to be transferred either real time or at specific intervals, depending on connectivity. In addition, freight operators could collect and share origin and destination data to enable investment prioritization models to better identify optimal freight routes that also support, for example, export activities.

Remove barriers to intermodal interoperability/Invest in intermodal operability [Policy 20]

Remove regulatory barriers to improve inter-operator and intermodal interoperability. Rail is often the most cost-effective and therefore dominant transport mode for large, uniform cargoes traveling long distances. But many rail—appropriate commodities have shifted to road haulage such as grains, fuels, coal, steel, cement, vehicles, and containers. Despite often being inefficient compared to effective rail transport, roads are now the dominant transport mode for high-value commodities, general freight, and other heavy goods. This inefficient distribution of freight between road and rail is perpetuated by the consistently low levels of railway service.

In urban passenger transport, monopolies have been created in conventional bus services. Furthermore, state monopolies exist in urban rail and competition for the market is destructive in the taxi industry. New e-hailing services can provide more efficient and convenient services. Improvements in urban rail services will have a significant impact on universal access. Greater efficiency can be achieved with contracts put out to tender on an outcomes basis to ensure cost-effective services.

Based on global experience, a strategy to consider should entail the following : (i) Closer collaboration between public and private sectors to expand the resource base available to renew investment in freight and urban rail; (ii) undertaking feasibility studies for the assignment of the national passenger function to metropolitan municipalities; (iii) urban rail services to be procured and managed by the relevant metropolitan municipalities to ensure consistency with local integrated transport plans and urban development programmes; and (iv) a requirement for transport operators to be appointed through open, competitive tender processes.

Develop asset management standards and plans [Policy 21]

Develop asset management standards and plans to preserve, maintain, and manage transport infrastructure and their systems over their life cycle. A report[26] of 2021 shows that more than half or 54 percent, of the country's unpaved road network is in poor to very poor condition, while about a third or 30 percent, of the paved network shares a similar condition. Roads are in danger of further degradation and the backlog on rehabilitation is increasing. In addition, a quarter of the total metropolitan road network risks degrading from fair to poor condition. Similar conditions also prevail for the country's rail network, which has deteriorated and remains underutilized and inoperable as a result. However, it is important to note that urban metros have been able to retain higher levels of maintenance.

Provincial and municipal authorities, however, are severely affected by a chronic shortage of appropriate managerial and technical skills in the sector. Based on global experience, a strategy to consider entails developing an appropriate asset prioritization model and applying a systematic asset prioritization for road and rail assets in the country, specifically those which have been poorly managed, undermaintained[31] and constantly at risk of vandalism.

Use a robust framework for project prioritization [Policy 22]

Use a robust investment evaluation framework to prioritize the allocation of public infrastructure funding to infrastructure projects and associated services.

An effective investment prioritization model must not lose track of the country's social goals nor misinterpret basic access rights as an objective that can be traded off for economic growth. For example, the traditional benefit-cost analysis (BCA) techniques applied by systems such as HDM-4 are designed to address the first-world economy context and are only able to build in arbitrary, discretionary conceptions of social priorities. If these BCA methods were applied as the only decision tool by South African authorities, the resultant road investment prioritization schedule would be economically inefficient, politically unpopular, and distributionally skewed against the poor. Additionally, prevalent road maintenance scheduling systems cannot efficiently prioritize investments according to the sector mandate to: (i) satisfy citizens' right of access to constitutionally protected basic services, and (ii) maximally contribute to economic growth.

Based on global experience, the strategy here could entail ensuring that the prioritization framework extends beyond new and strategic capital projects, or a project appraisal focus, to cover efficient scheduling of maintenance activities.

Set and implement climate change adaptation standards [Policy 23]

Set climate change adaptation and resilience standards and practices. Integrate them into project design across transport infrastructure, roads, airports, and seaports.

South Africa is projected to experience some of the worst impacts of climate change. The region is the most exposed region to all temperature increases but the absolute gap between South Africa and other regions makes it more vulnerable to extreme climate events.[33] The National Climate Change Adaptation Strategy[34] calls for sector plans to include climate change adaptation. This will involve ensuring that key sectors—like transport—have drafted updated national climate change sector plans.

Unsealed roads are significantly more problematic and susceptible to climate change than sealed ones. The frequency and cost of maintenance works required by gravel roads are severely escalated by a range of environmental factors common in South Africa. Indeed, these factors contribute to typically higher lifecycle costs for gravel roads relative to low-volume seals. All-weather usability is potentially impaired on a high proportion of the gravel road network, which implicates time-sensitive basic services, such as healthcare.

Global experience suggests that all transport-related upgrades and newly provisioned assets should be specified with minimization of greenhouse gas emissions among the factors influencing standards, materials, and methods.

Build rail and maritime transport infrastructure [Policy 24]

Build infrastructure for energy and space-efficient modes such as rail and waterborne transport, and high-speed rail for corridors with sufficient demand.

The South African rail network is underutilized, and high-speed rail is too expensive.[35] The state of rail infrastructure has significantly deteriorated in the last decade. Global experience has shown that energy and space efficient modes such as rail and maritime transport should be encouraged for investment—specifically in the freight rail network where traffic volume justifies such investment and can shift traffic from road. These investments should ideally be powered by renewable and sustainable sources of energy shows a positive socio economic return but is not affordable from a budget perspective.

Based on global experience, the strategy to consider includes ensuring that existing urban rail infrastructure be maintained at initial design standards with support of private sector investment. This strategy ensures optimal land use solutions and sustainable urban development. It will usher in better outcomes for universal access, efficiency, safety, and green transport that are prioritized as part of the local government's mandate.

Develop and implement an integrated national transport plan [Policy 25]

National planning provides the policy priorities and outcomes. South Africa concluded the National Transport Master Plan (NATMAP) 2050 project in 2009. It is supportive of the four goals that define sustainable mobility—universal access, efficiency, safety, and green mobility—in the general sense.

The *National Land Transport Act* mandates the national Department of Transport to develop a national land transport strategic framework (NLTSF) that provides a framework within which a subnational government can plan and operate. The National Land Transport Strategic Framework[16] recommends that metropolitan municipalities act as the locus for decision making to ensure better integration between different public transport modes.

Based on global experience, developing and implementing an integrated national transport plan to cover the four policy goals, all modes of transport, and passenger and freight traffic is an important prerequisite to sustainable mobility. It should be considered that national plans continue to provide a policy framework within which authorities can plan, manage, regulate and fund public transport networks. Local transport strategies would then ensure greater relevance of plans and plans that are more reflective of the local economic context. The role of the integrated national transport plan in the context of national and provincial governments is to foster the ability of local governments to act autonomously in this area. Local strategic transport plans also increase integration with land use management, and thereby accountability. These plans would improve services, align modal plans to increase access, affordability, and improve land use management.

Facilitate Capacity Building at the International level [Policy 26]

Support sector specific—passenger or freight traffic, by mode—international capacity building by actively participating in international initiatives, by adopting and implementing international initiatives, and by taking lessons learned from country experience forward for international consideration.

South Africa is an active and prominent member and participant in the UN, African Union (AU) and Southern African Development Community (SADC). South Africa benchmarks as an Upper Middle Income Country (UMIC) and should be considered in that capacity in its peer group.

Global experience suggests that regional investment to support capacity development for universal access, efficiency, safety, and green technology would allow for lessons to be shared across countries facing similar challenges. International support and capacity development for other developing countries would be relevant and valuable in addressing low levels of affordability, rapid urbanization impacting on urban mobility pressures, informal transport efficiency, safety, and climate challenges for warmer areas.

Coordinate planning across government agencies [Policy 27]

Coordinate across agencies to ensure integrated planning and shared responsibility for results across levels of government, jurisdictions, and agencies, including but not limited to the coordination of road safety responsibilities and response to extreme weather events.

The *National Land Transport Act, 2009* (NLTA) provides for the institutional arrangements for land transport and specifies the responsibilities of the three spheres of government.[39] Many of the policy recommendations are reliant on coordinated planning across the various transport departments or agencies and across government departments. Based on global experience, a strategy to consider includes extending planning coordination beyond the transport sector to cover associated departments.

Leverage innovative forms of mobility during crisis response [Policy 28]

Emerging transport innovations have important roles if not yet mainstream and may be leveraged during crisis response, for example, automated vehicles and drones are among the current technologies with most potential.

The *Disaster Management Act*[40] provides for responses to disasters. The Act mandates that municipalities are primarily responsible to coordinate and manage local disasters that occur in their area. New transport innovations are not specifically provided for in these plans. Emergency response plans tend to be focused on mass evacuation for example in the case of a nuclear accident. Transport policy currently does not engage with technology issues apart from at a regulatory level.

Technology has several benefits when applied to industry. For example, the use of the internet of things (IoT) in the transportation industry helps reduce traffic congestion.[41] Platforms have been created to enable smarter route mapping to avoid congestion. Car manufacturers have also turned to IoT by incorporating innovative technologies into their cars to help ease the driving experience for drivers. For example, some of the latest vehicles have traffic jam assist technology, which allows the car to match the speed of the vehicle ahead of it, which eases traffic flows and decreases congestion. The use of ride-sharing and carpooling services has increased dramatically over the years, with companies such as Uber helping reduce congestion and making an impact on the economy while this is done. Vehicle tracking technology can improve regulation, information for planning and enforcement, and provide data for further transport innovation. In emergency situations driverless vehicles can improve evacuation outcomes and increase mobility.

Based on global experience, a strategy to consider includes embracing innovative forms of mobility for crisis response and beyond in South Africa. This can be done by addressing the existing barriers to uptake of innovation and social acceptance, logistical challenges to scale-up and offer government support. Additionally, local planning and autonomy may improve the extent of transport network coverage attracting private transport users to public transport and reducing emissions.

Share Knowledge on successes and best practices [Policy 29]

Share successes and best practices with other agencies at the local, national, and international levels, based on a well-designed knowledge transfer framework.

South Africa is committed to regional capacity development through the southern African region. Since South Africa became a member of the SADC in August 1994, the DoT has been actively involved in the activities of the Southern African Transport and Communications Commission (SATCC). Integrated transportation systems are required to link the South African economy with that of the region.

Based on global experience, a strategy to consider includes: (i) continued knowledge sharing between South Africa and neighboring countries; (ii) continued consultation with the provinces and private sector where appropriate; and (iii) embracing multinational agreements with multinational development banks.

Develop data repositories and data collection guidelines [Policy 30]

Develop centralized data repositories and establish data collection guidelines at the national and metropolitan levels. Facilitate data access to different stakeholders—academics, private sector—while establishing a legislative framework defining the context and purpose of its use.

As part of the legislated development of an integrated development plan, municipalities are required to develop their strategic planning of their five-year municipal integrated transport plans (ITPs) that provide for the contract management and regulatory functions. These plans call for specific data on routes and services. Various documents guide data collection guidelines but lack a key reference document for all modes. The roads sector's "TMH 22: Road Asset Management Plan" (RAMP) only references the road sector while general transit feed specifications are not available for road-based public transport and nor is any information for rail service or headway.

The prevailing practice is unsustainable as it does not support the delivery of required information. It is costly, does not transfer skills, and frequently does not influence transport planning as the information is not available or not available in the appropriate, standardized format. Despite some progress in systematizing performance evaluations, the availability and quality of data remain a major obstacle as some operators are unwilling to share information.

Global experience suggests that service providers report standardized data (see policy action 19). Once reported, these data should be housed within an effective data repository to improve the consistency and availability of existing data. The information must be of the quality that can be: (i) used for compliance with operating license terms; (ii) standardized to allow for planning; (iii) and publicly accessible to support transport innovation.

Build capacity across levels of government [Policy 31]

Build national and local capacity across levels of government, jurisdictions, organizations, and modes, and provide training and information resources.

The National Land Transport Strategic Framework calls for investment in capacity of transport systems to support delivery. This policy is also reflected in the 2018 Draft Roads Policy for South Africa.[42] The absence of an integrated national transport database available to relevant stakeholders has led to a major misalignment of planning, development, and investment in transport infrastructure and operations. Capacity support to coordinate planning that monitors and builds capacity in municipalities has failed. Consequently, operators, users, and services have suffered. Provincial and municipal road departments are severely affected by the chronic shortage of appropriate managerial and technical skills in the public roads sector.

Based on global experience, a strategy to consider includes for national and provincial governments to focus less on strategy and planning and more on capacity development for local governments. Municipalities may also have to augment their own capacity through institutional arrangements available to local government.[43] For road safety, bringing together all stakeholders through a safe

systems approach is recommended, for which building capacity at all levels of government would be a critical parallel step.

Notes

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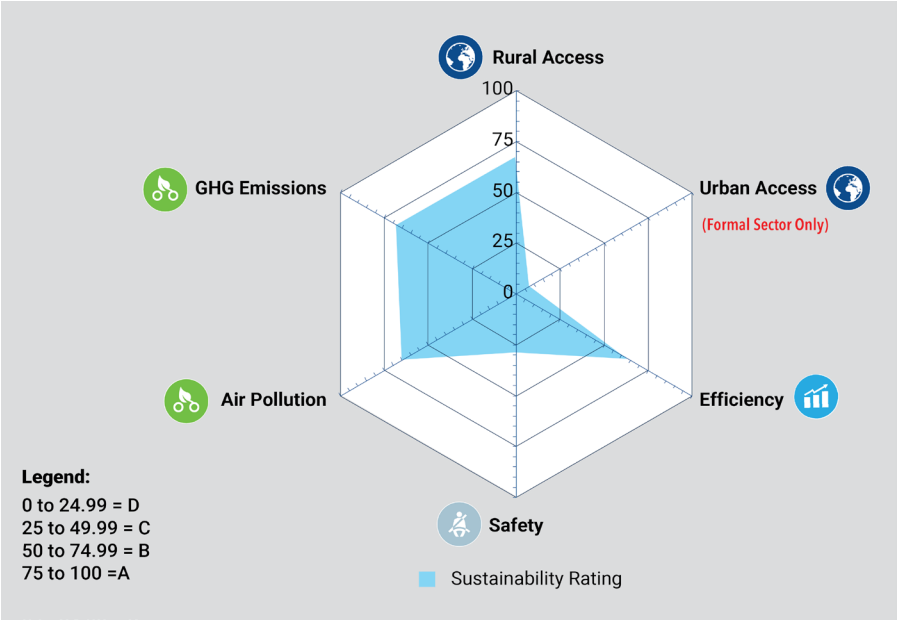
Appendixes

Appendix A. South Africa's transportation and mobility system

This appendix summarizes key findings from the diagnostic paper, "South Africa's Mobility Report." The diagnostic relies on data, global indicators, and comparative analyses to identify strengths and areas of improvement in the mobility system. For each of the four goals (universal access, efficiency, safety, and green mobility), the paper benchmarks South Africa's performance against a range of comparators, including the best performer in the world (global comparison), and countries that share regional (Sub-Saharan Africa) and income-level (upper middle-income countries) similarities. Collectively, these comparisons provide an indication of both achievement and areas of potential focus going forward. This study relies on published, administrative data from secondary sources produced by a range of organizations, and published survey data, and global indicators. The templated approach for measuring performance across countries provides a useful starting point to identify gaps in sustainability (figure A.1).

Figure A.1. South Africa sustainability rating vis-à-vis best performing country in the world (=100).



Source: Sustainable Mobility for All, Global Tracking Framework for Transport Data. Authors' own computation.

Notes: a. Sources: Rural– Computation on Rural Access Index (geospatial RAI methodology) [RECAP 2016]; Urban - Computation on Rapid Transit to Resident Ratio [ITDP 2018–19]; Efficiency: Computation on Logistics Performance Index – overall [World Bank 2018]; Safety: Computation on Mortality due to Road Traffic Injury [World Health Organization 2016]; Air Pollution - computation on PM2.5 air pollution, annual mean exposure [Global Burden of Disease Study 2017]; GHG emissions –computation on Transport Related GHG emissions per capita [World Bank computation on International Energy Agency data 2016].
b. Noise Pollution and Gender are two important dimensions missing due to data limitations.

The sustainability gap analysis suggests that the two biggest issues to address in South Africa are universal access and safety—although efficiency and green mobility merit further improvement as well (figure A.1). South Africa's cities exhibit the largest gaps in accessibility when differentiating access between urban and rural areas.

Universal Access

- In terms of coverage and length, South Africa has a comprehensive road network, which places South Africa in the 90th percentile in terms of the road connectivity index in the world. This achievement should be assessed in the context that South Africa has the 10th longest road network globally and amongst the densest road networks in the world, indicating efficiency issues. On a scale of 1 to 7, where 7 is the best in the world, the quality of railroad infrastructure is 3.55. This exceeds that in sub-Saharan Africa (2.40) and the UMIC (3.00). South Africa is the leading country in air transport connectivity score in Africa and ranked in the top 20 globally in 2016.
- South Africa's strides in reducing the access gap in rural areas between 2000 and 2016 but deteriorating rural road conditions have a negative impact on rural access with only 15% of gravel roads determined to be in "good" and "very good" condition. The access gap in rural areas is estimated at 32 percent relative to the best performing country in the world. Access problems result mainly from backlogs in maintaining the existing road system.
- In comparison, the access gap in urban areas is much larger (92 percent), using the Rapid Transit to Resident RTR ratio indicator. Complementary econometric analysis that accounts for spatial inequality and paratransit services (minibus taxi services) validates a sizable gap in urban areas. In spite of massive investments in urban transport infrastructure over the last decade, and the use of informal transport, South Africa's public transportation system has fallen behind on several grounds: access to public transportation, average travel time, and affordability.
- Urban households use public transport modes and access is provided primarily by minibus taxis. Rapid transit services, with dedicated infrastructure, are only available in Johannesburg, Tshwane and Cape Town. Urban rail does not meet the service frequency and quality criteria for rapid transit. Ridership on the mass transit Metrorail system has been in steep decline since 2014. Fewer than half of adults feel safe walking in their area of residence when it is dark, creating a barrier to access and active mobility. Females, more often than males, report feeling unsafe walking alone in their area of residence after dark.

Safety

- In the last decade there has been a marginal reduction in the annual number of road accident fatalities from 13,967 in 2010 to 12,503 in 2019, placing South Africa with a safety gap of 71.4 percent relative to the best performing country in the world. South Africa is among the best performing countries in meeting ICAO aviation safety standards. South Africa had no fatal accidents as a State of Occurrence on scheduled commercial flights. Operators from South Africa had no fatal accidents outside of the country during that same period[1]. South Africa's effective implementation of aviation safety procedures—as measured by ICAO's Universal Safety Oversight Audit Program (USOAP)—is above the benchmark set by the Global Aviation Safety Plan 2017 as well as the world average.

1 https://www.icao.int/safety/Implementation/Pages/Home.aspx

- Maximizing road user behavior that is compliant with road rules remains an important issue. In relation to contributing factors, driver or human error was the cause of 89.2 percent of major crashes.[2] The fatality rate for pedestrians is extremely high. The reported number of road fatalities suggest significant action is needed to achieve the target to halve road fatalities by 2030. The rail environment is not safe for commuters served, as well as the broader public in South Africa. The 2018/19 State of Safety Report highlights increasingly negative long-term trends in both the safety and security-related incidents[3]. Road accidents cost the country an estimated 3.5 percent of GDP per year in 2017.

Efficiency

- Based on the logistic performance index, South Africa shows an efficiency gap (in terms of service delivery and quality of the infrastructure) of 36.6 percent relative to the best performing country in the world. Compared to the region and income group, South African air transport services, seaport services and freight rail services exceed the average rating. South Africa's quality of air transport infrastructure is relatively better than the average in its region and income group.
- The condition of the primary road network is good with 60 percent of national roads in good to very good condition, and about 36 percent of that road network is in fair condition. South Africa has performed well on quality of the regulatory frameworks that support procurement, asset, and contract management. The country scores above average on the digital adoption index, which could enable more efficient mobility.
- However, South Africa's connection to global value chains is relatively low. It ranks 84 out of 190 countries in the Doing Business 2019 edition, but 145 in the "Trading Across Borders" index, behind regional neighbors like Botswana and Namibia. In the maritime sector, South Africa plays a significant role in the region, but ranks poorly in terms of connectivity and operating efficiency. Port operational delays are worse than regional or income comparators. The 2021 World Bank Container Port Performance Index ranks the Durban Port 149th out of 151 global ports. About 90 percent of South Africa's exports and imports are handled through maritime ports, but these ports are relatively expensive, are facing inefficiencies and becoming less reliable. Per ton, other than exports of mining output, rail freight has become more expensive than road freight. The quality of the government-owned freight network is deteriorating, and the system is facing security challenges, failing signal systems and lack of reliable locomotives. Deterioration in freight rail and port transport in addition to regional road conditions and border post delays, negatively affects cross-border trade flows, regional development, and competitiveness.
- Urban rail in South Africa has declined in the past decade to an extent where it is no longer serving as a mass public transport form. Operational failures, low service quality, safety, and security issues, unreliable and unavailability of services have seen passengers shift to other public transport modes. Urban public transport is characterized by long distance trips, unidirectional demand, low seat renewal and high peak time demand which reduces efficiency and financial viability of services, especially in smaller metros and secondary cities. Urban mobility is plagued by high levels of congestion, travel delays, long transit times and reduced safety. Cape Town and Johannesburg both recorded heavy congestion in 2019. South Africans

2 Road Traffic Management Corporation, State of Road Safety Report, 2019
3 https://www.railwaysafrica.com/assets/news/state-of-safety-report-2018-2019/SoS-Report-2018_19.pdf

spend disproportionately more time to access social services and urban amenities and walk long distances. Average travel times have worsened by more than an hour for users of all modes of public transport.

Green Mobility

- South Africa has an air quality gap of 35.5 percent relative to the best performing country in the world, and a gap of 32.4 percent in terms of GHG emissions. The country ranks in the 70th percentile against the best performing country in the world on transport related GHG emissions per capita. A carbon tax on vehicle emissions is implemented as part of the fuel levy, supporting the "polluter pays" principle. South Africa is a leader on electrification in transport relative to other African countries, but its source of energy still depends heavily on fossil fuels for electricity generation via coal.
- South Africa ranks 14 among the largest emitters of GHGs (GreenHouse Gas) in the world, contributing one percent to global emissions. The South African energy supply is dominated by use of coal which constituted 69 percent of the primary energy supply in 2016, followed by crude oil at 14 percent and renewables at 11 percent. The transport sector constituted 19 percent of energy demand in South Africa, second only to the industry sector at 52 percent. South Africa's transport system is energy and carbon-intensive compared with countries in the region or with similar levels of income. Eighty-six percent of total transport emissions come from road transport, which is equivalent to eight percent of GHG emissions. The transport sector depends heavily on liquid fuel. The road sector consumes about 79 percent of all liquid fuel, followed by international civil aviation at 13 percent.
- South Africa's policy intention is to reduce transport's GHG emissions by at least five percent by 2050.[10] by prioritizing public transport, facilitating a shift from road to rail and supporting cleaner fuels. Owing to a highly carbon intensive electricity grid of 823 grams of carbon dioxide per kilowatt hour, South Africa is positioned among the top five percent of countries for which electrifying mobility will increase transport sector emissions.

Against the backdrop of sustainability, benchmarks, and index ratings, it is noteworthy that South Africa's progress has had to contend with the challenges of the weight of colonial legacy and of apartheid, which have strongly tempered transport's reach. Spatial inequalities, geographical disabilities, distances to ports are among the harsh realities to counter as are the consequences of the COVID-19 pandemic and the escalated costs that the transport sector will inevitably and increasingly encounter.

Any complacency about the extent and quality of progress would be premature and misplaced as it is growingly incumbent on South Africa to build the momentum of its robust, enlightened policy into effective implementation and advance its directional efforts in sustainability to fulfil the four goals so that noble aspirations and ambitions do not fall out of reach with time, but rather become realizable benefits to all persons in South Africa.

Appendix B. White paper on business contribution to "Piloting the GRA in South Africa"

This paper aims to capture and structure, from a business perspective, the contribution from participants in the SuM4All-led Working Session at the Movin'On Summit (MOS) 2021 on June 1, 2021. This collaborative event entitled "Driving Sustainable Mobility in the Global South through the Private Sector: The Case of South Africa" gathered about 40 stakeholders around the specific topic of public transportation, and to facilitate implementing business sense solutions that help sustainable mobility. This paper also includes feedback from post-event interviews with relevant participants, who could not attend the session b.

What are the main challenges businesses encounter?

The public transport system in South Africa: Context and reality from a business perspective

Sustainable mobility—affordability, accessibility, safety, decarbonization and quality employment—in South Africa is a challenge; South African cities are poorly connected by public transport. Combined with an aging fleet and growing number of unroadworthy vehicles as well as congestion on numerous road networks especially in urban areas, mobility becomes an issue for its inhabitants.

Carbon intensive[1] BRT and rail, which are the official public transport modes, suffer from infrastructure ill maintenance, vandalism, and more.

Quality is the missing feature of the mass transport offered. With penetrating shocks like COVID-19, the apparent supply has collapsed because of deficits on all fronts, particularly in fleet and passengers, and passenger information systems. An increase in prices and a decrease in revenues for the operators are attendant corollaries. This is a problem when cost is the most crucial factor influencing the choice of transport mode in South Africa. Considering that cost of public transportation is significantly on the rise in South Africa,[2] affordability is an impediment in accessing public transport in South Africa,[3] especially because lowest income households are disproportionately affected by the cost.[4]

The government has committed to providing South Africans with sustainable public transport. Many initiatives, discussions and plans engaged in during the last 15 years from the Department of Transport have attempted to facilitate greater cooperation toward achieving sustainable mobility for everyone. The strategies are unable to or slow to implement. No comprehensive public transport schemes have emerged so far, plagued by a critical lack of managing public transport in integrated transport plans, at a time when COVID-19 should have sped up the process.

The South African use case is emblematic for Global South, where informal public transportation is a widely spread reality. Minibus taxis are the dominant mode of collective transport operated by 16-seater minibus that provide a door-to-door, flexible, and affordable service for about 15 million commuter trips daily to work, schools, and universities to access healthcare or leisure. Minibus taxis therefore became the main mode of transport for 50 percent of South Africans. Approximately two thirds of the transport sector workforce are informal. From drivers to cleaners to conductors to mechanics to painters to occupations linked to admin work, the informal transport ecosystem supports many livelihoods.

The systemic issue of the informal transport sector: barriers – solutions

Barriers

i) Issue of cost

- Operators are not incentivized to transition toward formalizing the sector, as this would involve additional costs such as licensing, taxes, and compliance. Finances are already tight, considering that the average monthly cost to work in South Africa increased by 86 percent for minibus taxis between 2013 and 2020.
- Most commuters live far from their workplace, and some spend up to 60 percent of their income on minibus taxi fares.

ii) Issue of political will

- South Africa is a very advanced country despite its UMIC status —although with high levels of poverty and inequality. Road's standards of design, signage, and traffic laws are at par with any other country. White papers and policy documents are good and most legislation is sound.
- But lagging political will has led to a systemic collapse of conditions. Many transport policies and laws have been formulated in the past, but never come to fruition as intended. Political

will lags to properly enforce the existing regulatory framework. In the span of 10 years, South Africa had five different Ministers for Transport. This is because there is an imbalance of power between the informal sector and public authorities; the informal sector controls the transport system and encourages the distrust of local governments among all actors because no one can agree on a vision for the sector.

iii) Issue of workers' conditions

- No formal contract of employment, no access to organizational and employment rights, daily pay to name a few administrative flaws. This translates into a vulnerable workforce whose fragile livelihoods were impacted by COVID-19.
- Quality jobs can only be created through empowering workers. SA has strong labor laws, yet informal transport workers are excluded.
- All occupations are becoming dependent on the informal minibus system.

Potential solutions

What is required to facilitate the adoption of solutions that make business sense and help sustainable mobility? Given the barriers opposing the formalization of the transport sector, discussions during the Session revolved around potential solutions for the private sector to foster public transport ridership expansion in a sustainable way. Those solutions can be captured through three business lenses.

i) The costs issue

- One must investigate affordable technologies that complement and improve existing transport systems—for example, incorporating digital payment methods into informal transportation markets reduces the high transaction costs of a vastly cash-based system, thus embedding business solutions to what is already in the market.
- Transport must embrace data sharing and digitalization. Digitalization can help drive down cost by making those services much more cost effective. For example, mapping informal transit routes via mobile phone apps can drive consumers toward making most cost-effective and informed choices of mobility options.

Recognizing the importance of relevant, impactful incentivizing the transformation of the informal irregulated transport sector, ensuring that workers who are part of the system feel the incentive and see the benefit of a transition toward a more regulated or transformed system.

From a business perspective, a clear and consistent regulatory framework is central in enabling private actors to play their key role as solutions providers in the field, in new products, new services, and innovative business models.

ii) Regarding lagging political action

- Businesses unanimously call for a holistic public transport approach including the minibus taxis industry as it is the missing link that fills a gap in availability, flexibility, affordability, and geographical coverage. This approach can only be led and driven by national public authorities.
- This point is a key aspect to accessibility: the upside is that the backbone of the transport network is good, and the assets are evident. It would be best to invest in a win-win scenario for

labor, citizens, government, and the informal sector to set a pathway to formalization. However, to get businesses on board, the government should clarify its stance regarding ambitions of safety, conditions of employment and more.

iii) Regarding employment conditions

- Corporates, as employers, have a responsibility of negotiating with the government to structure the transport system. They could for example, as part of their customer service commitment, absorb transport costs for their lower income employees.

The integration of the informal workforce into the existing formal public transport system can facilitate equalizing the quality of jobs and terms and conditions of employment.

In any case, any kind of process of formalization for the informal workforce cannot be ruled by imposed measures, but needs to involve consultations, social dialogues, and partnerships, and not be seen as an imposition.

- Hence the importance of having all stakeholders participate in the process of formalization to avoid any conflict of interest. Informal actors, building on the actual position of strength they have in the power relationship with the state, should rally and combat all public licenses and authorization-based transportation means, and encourage the creation of a permissible framework instead.
- Informal actors would be co opted into a coalition that aims at safe, affordable, reliable, and accessible transport. Leveraging SmartCard, or the transit pass, for user subsidies means users should inject more funds into the transit network in a virtuous cycle.
- A solid coalition would help with organized labor and businesses, and the informal sector to get those people to work successfully together. Private sector participation is vital to transform the transport sector but government handholding is critical. The private sector can immensely help in formalizing transport for it is vital that local governments as well as states support private–public initiatives. This coalition may involve derisking public transport projects by structuring the terms of the coalition appropriately, and by offering incentives as well as subsidies—at least in the initial phase until economies of scale and scope pick up.

The need for a coalition of actors in the formalization process: What's the role of businesses?

Businesses have a role to play in facilitating such a coalition to formalize the transport sector in South Africa. What should this coalition look like and what does it mean in financing, digitalization, decarbonization technology, and infrastructure improvement? What is the role of each member of the coalition?

Cost is the most crucial factor in South Africa. Public authorities should step up to develop a tariff policy combined with private funding to go further. The roadmap must be established with a strategy of examples of key projects and a pilot that benefits from the support of the private sector. This would bring together all stakeholders to facilitate the technical and financial support that big corporations can provide.

The private sector as an investor

The informal sector is being set aside in public policy because politicians tend to adopt the western mass transport system of bus and rail ignoring the reality of minibus taxis. We see investments from powerful foreign companies in standard official transportation systems regardless of the informal sector. These companies have the technology and the resources required to identify local companies that manufacture biofuel or retrofit for example, and invest in local initiatives, therefore leveraging the informal sector to create positive externalities.

Illustrative for this approach is ALSTOM that engaged in a joint venture "Gibela" in 2018 with local shareholders—Ubumbano Rail and New Africa Rail—for the supply of 600 commuter trains in the next 10 years.

Foreign companies could bring in their expertise and local businesses could work to implement the model. It would be good to identify and boost local champions in each industry. We must act in a reversed logic as compared to what is done in the Global North—seeing that those local businesses are supported by powerful foreign companies, the public authorities will follow. What is crucial, is for the company to take a step back afterward and make room for the local private sector actors. It is difficult for public authorities to encourage those big companies to do so because of the political elements at stake, hence the importance of a common vision in the coalition.

Traditional investing: banks and finance

- Models of ownership have a direct impact on safety and quality of jobs. Shared or cooperative ownership is a valuable tool to build economic empowerment. Financing models can include existing Black Economic Empowerment (BEE) schemes by private companies.
- Different models of ownership can be implemented, based on how important these are to create quality jobs and a sense of economic and worker empowerment.
- Banks can also supply microcredits, but loans must be available at affordable rates. Hence the importance of looking at microfinancing in a way that does not entrench existing inequalities in the workforce.
- The role of foreign banks is to be emphasized. One could think of encouraging them to work with local players who have data that can track accounts, thus raising funds to invest.

Third party investors such as the Advans Group, which supply microcredits, also have a role to play and should arrange partnerships with local banks.

Investing in infrastructure

- Passengers are not cost incentivized to use electricity-powered vehicles and transport systems in South Africa. It would be interesting to have the private sector absorb or at least share the cost of vehicles by upgrading the fleets. Overall, private sector involvement in greening public transport in South Africa is key to achieve sustainable mobility. Electrifying the taxi network or fleet is essential and will require necessary charging infrastructure to power the vehicles. Here, real estate companies need to come together to provide those infrastructures, which is the biggest challenge for clean energy.

The charging infrastructure could be set up in petrol (gas) stations, thereby expanding the network to make it operational for a large fleet of minibus taxis. This would simplify the formalization process.

- Rail infrastructure is a key issue in formalizing the transport economy. It is outdated and vandalized. Railway companies are recommended to use space available along the rails effectively in land use planning, such as creating commercial premises, to create revenues and incomes and enable renovation. A coalition can encourage public and private sectors—capital and technical solutions combined with enabling frameworks for infrastructure—to invest in infrastructures needed to drive uptake of cleaner vehicles and up-to-date, profitable rail.

The private sector as a technology provider: Innovation, data and digitalization.

- Digital platforms created by companies could help manage regulation and improve passenger safety in minibus taxis. While a tracking device already requires a license in South Africa, an idea is to go a step further. Each minibus taxi could be required to have such an app as a prerequisite to obtain their license—an app, which would monitor behavior and efficiency, linking these data to insurance, following drivers' driving habits, and leveraging insurance cost by driver behavior. Location-based apps are simple, efficient, and accessible.
- Businesses can invest in technologies that improve existing transport, using data to improve public transport and therefore price. Using open data and open-source communities to build a solid travel system can create a tangible local industry, which will speed up the formalization process.
- Overall, digital infrastructure and data sharing are key in data-creating value, not just in the transport sector but in welfare and better salaries for workers.

The private sector as an employer

The private sector must not only play an economic role, but it must also be involved in creating a framework for discussion. The legitimacy of the private sector should allow this to happen. Gradually formalizing the informal transport sector in South Africa could reduce costs or increase value for money for consumers through economies of scale, better quality of service, and competitive pricing. Incentives could take the form of minimum wage legislation, regulated hours to curb long workdays for operators, and other perks such as state health insurance. Again, however, this must happen through a coalition of actors sharing a common vision. Only then can the formalization process of the transport sector begin.

Participants in the Working Session 'Driving Sustainable Mobility in the Global South through the Private Sector: the case for South Africa' at Movin'On Summit 2021

Working Session lead: Dr. Nancy Vandycke (World Bank – SuM4All).

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Notes

1 86 percent of transport emissions (and 8 percent of total GHG emissions) come from road transport.

2 According to the South Africa General Household Survey of 2020, travel cost was selected by a majority of respondents (31 percent) as the key consideration when choosing how to get from point A to B.

3 South Africa's White Paper on Transport Policy set an expenditure target of 10 percent of disposable household income for public transport use. For passengers this means the cost of transport should represent a reasonable and declining percentage of disposable income from the current average of 30 percent, as measured in the National Household Travel Survey, 2013. Source: https://www.gov.za/sites/default/files/gcis_document/201803/nationalwhitepapertransportdraft_1.pdf

4 ZAF general household survey of 2018 found that 66.6 percent of workers in households from the lowest income quintile spend more than 20 percent of their monthly household income per capita on public transport


SUSTAINABLE
mobility
FOR ALL