

Key Interventions toward Urban Sustainable Transportation in South Africa

Marianne Vanderschuren¹, Alison Gwynne-Evans¹, Esteban Velez Vega², Geetha Mohan², Osamu Saito², Kazuhiko Takeuchi^{3,4}

1. University of Cape Town
2. United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)
3. The University of Tokyo
4. Institute for Global Environmental Strategies (IGES)

Highlights

In identifying sustainable transport interventions in South Africa, key challenges include fragmented government structures, the safety and security of transport users; the bias towards motorized transport; poverty and inequity levels and ad-hoc funding practices. High priority interventions include:

- Investment in essential non-motorized transport infrastructure
- Spatial transformation including transit-oriented development (TOD)
- Road safety and security of people
- Universal access focused planning
- Sustainable funding solutions

Sustainable funding solutions. “Sustainable transport is fundamental to progress in realizing the promise of the 2030 Agenda for Sustainable Development and in achieving the 17 Sustainable Development Goals. Sustainable transport supports inclusive growth, job creation, poverty reduction, access to markets, the empowerment of women, and the well-being of persons with disabilities and other vulnerable groups. It is also essential to our efforts to fight climate change, reduce air pollution, and improve road safety.”

New York City, October 2016

Former UN Secretary-General Ban Ki-moon

The challenges and interventions were initially identified by research, including academic articles and policy documents, and elaborated through two local workshops in SA in August 2018 and January 2019. More than 20 policy makers, representatives from NGOs, funding agencies, and experts participated in each workshop. During the first workshop, more than 20 potential interventions were identified; these were prioritized using the three dimensions of sustainability: social, economic, and environment. Potential interventions were ranked based on the three dimensions separately and later combined to obtain the overall top five ranked interventions. Then the top five interventions were further elaborated to include specific examples and actions during the second workshop.

INTRODUCTION

This policy brief is an output from the project “Development Strategy for Urban Sustainability in Africa on the Basis of SDGs Interlinkage Analysis” (USiA), led by the University of Tokyo and United Nations University in Tokyo in collaboration with African partners and funded by Japan International Cooperation Agency (JICA). This project’s goal for South Africa (SA) is to propose a set of potential interventions that contribute strategically towards achieving sustainable transportation.

Sustainable transportation definition

A sustainable transport system “allows the basic access and development needs of individuals, companies, and societies to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations; is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as

balanced regional development, limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses nonrenewable resources at or below the rates of development of renewable substitutes while minimizing the impact on the use of land and the generation of noise.”¹

Sustainable transportation requires “the provision of services and infrastructure for the mobility of people and goods advancing economic and social development to benefit today’s and future generations in a manner that is safe, affordable, accessible, efficient, and resilient, while minimizing carbon and other emissions and environmental impacts” (UN, 2016, p. 72).

KEY CRITERIA FOR SUSTAINABLE TRANSPORT IN SOUTH AFRICA

Sustainable transport provides transport services and infrastructure for the mobility of people and goods, advancing economic and social development to benefit current and future generations in a manner that is **safe, affordable, accessible, efficient, equitable, and resilient** while minimizing carbon and other emissions and environmental impacts.

In the South African context, the security of people and assets, due to crime and vandalism, is a significant concern because of the crime and vandalism. Supplementary sustainability issues to consider include the barrier effect that separates communities and ecosystems, the effect of health on access, due to age, gender, culture, physical and mental ability.

SA is a young democracy built on a constitution setting out a vision of fairness and equality. This constitution is supported by comprehensive and forward-thinking policies in the different areas of public life, emphasizing equity and prosperity.

The sustainable transport criteria emphasize the following:

¹The definition is contained in a resolution entitled “Strategy For Integrating Environment And Sustainable Development Into the Transport Policy,” also known as the April Resolution, adopted by the Ministers responsible for Transport and Communications at the 2340th meeting of the European Union’s Council of Ministers held in Luxembourg in April 4–5, 2001. (<http://corporate.skynet.be/sustainablefreight/trans-counci-conclusion-05-04-01.htm>)

Safety

Provide a free-from-danger transportation system to reduce road injuries and deaths. Focus on making them accessible, resilient, and dependable for the most vulnerable in developing countries.

Affordability

Foster transportation cost reduction, especially for poor communities, so that they can access better quality of life. Affordability contributes to increased competitiveness and growth for the economy. An affordable transportation system drives people to access jobs, markets, education, and health institutions irrespective of their income.

Accessibility

“Transport is not an end in itself, but rather a means allowing people to access what they need: jobs, markets and goods, social interaction, education, and a full range of other services contributing to healthy and fulfilled lives” (UN, 2016, p. 12). An interconnected, affordable, convenient, and reliable transport system promotes accessibility for all.

Resilience

The transportation system should be strong and quick to recover from climate impacts and other natural and economic shocks and chronic stresses. Resilience planning encourages adaptive capacity to passenger and freight transport networks, infrastructure, and services.

Efficiency

Compact and connected urban development built around mass public transport and non-motorized transport (NMT) can create cities that are economically dynamic, healthier, and have lower emissions. Public transport is central to reducing road congestion and the associated costs in cities.

Low environmental impact

A transport system should not be reliant on fossil fuels and should encourage clean modes of transport with the lowest environmental impact; this promotes behavioral shift toward taking shorter and fewer trips using zero-emission vehicles and NMT.

SOUTH AFRICA SPECIFIC CHALLENGES

In the South African context, there are specific challenges of personal security while travelling, such as inherited issues of inequitable travel times and distances affecting costs for users, operators, and all levels of government. Furthermore, the sustainability of long-term funding requirements, including operating budgets, must be considered.

Other challenges faced by the South African transport system are:

- SA has one of the highest road fatality rates in the world. Investment in infrastructure requires a corresponding focus on road safety and personal security for NMT and public transport users.
- A significant proportion of the South African population cannot afford any type of transport.
- Between 2003 and 2013, the percentage of South African households that have access to private vehicles has increased from 25% to 35%. This implies an accompanying increase in congestion and emissions, against the desirable trend for sustainable transport.
- The rail system is severely strained under lack of new investment and incidences of violence/sabotage. Metrorail delays in Cape Town, increased from 4% to over 25% between 2015 and 2017 and continue to increase.
- Bus rapid transport (BRT) operational expenses are unaffordable to metros.
- The rollout of universal access for all needs to be sustainable to affect changes in usage patterns.

HIGH-PRIORITY INTERVENTIONS

1. Investment in essential Non-Motorized Transport (NMT) infrastructure, including the spatial environment

NMT has the potential to contribute to economic transformation by providing opportunities for small businesses linked to NMT support services, as well as through the promotion of NMT activities in the tourism and local economic development sectors. Moreover, NMT infrastructure can provide quality environments to support social transformation.

This intervention can contribute to increased levels of active and non-motorized modes of transport by fomenting safe, accessible, and clean spaces and

services. A behavioral shift from polluting motorized to NMT modes is to be expected for short urban trips, stimulating healthy lifestyles and reducing the transportation environmental impact. This requires investment in infrastructure, such as interconnected bicycle exclusive lanes, safe and enjoyable sidewalks, lighted streets, slower speeds for cars, convenient bicycle parking, policy enforcement on pedestrian and cyclist prioritization, urban green spaces, and NMT awareness and signalization campaigns.

Increased levels of active transportation for short trips reduces air pollution and increases human health and well-being. Access to NMT modes for all requires the building of safe and interconnected NMT infrastructure in order to reduce road fatalities and injuries. Access and speed within the cities for motorized polluting vehicles must be reduced. Furthermore, NMT must be championed as a component of healthy and sustainable lifestyles to change the cultural perception between car ownership and social status.

2. Spatial transformation, including transit oriented development (TOD)

Inclusive TOD is a necessary foundation for long-term sustainability, equity, shared prosperity, and civil peace in cities (Abe, 2013). TOD requires integrated urban places designed to bring people, activities, buildings, and public space together, with easy walking and cycling connection between them and near-excellent transit service to the rest of the city. It means inclusive access for all to local and citywide opportunities and resources by the most efficient and healthy combination of mobility modes at the lowest financial and environmental



cost and with the highest resilience to disruptive events.

TOD can result in significant benefits to individuals, communities, and entire regions by improving the quality of life for people of all ages and abilities to live, work, shop, learn, and play. TOD reduces travel time, shortens journeys, and provides non-motorized trip options and allows for more accessible, efficient, convenient and resilient mobility for people and reduces the impact on the environment (Haven, Springfield & Program, 2015).

TOD allows for a more accessible, efficient, convenient, and resilient mobility for people, reducing impact on the environment. Using a TOD approach in all urban planning interventions is highly recommended. Moreover, it is essential to establish public transit and NMT prioritization; create dense connected networks; stimulate high-quality public transport; develop spatial planning for mixed uses, income, and demographics; optimize city density with short transit commutes; and minimize land use for motorized vehicles.

3. Road safety and security of people

Infrastructure must be secured to reduce fatality rates from traffic accidents and foster economic efficiency. Formal segregated sidewalks and bicycle lanes encourage people to shift motorized modes of transport to NMT and active transportation, especially for short trips.

Proactive public policies with adequate funding and supporting police force ground actions that provide secure streets, especially for vulnerable groups of people (e.g., women and children), can help increase the use of NMT and improve accessibility and inclusiveness in public transportation systems.

Road safety plans should include improved data collection, engineering interventions, enforcement programs, and education campaigns.

4. Providing universal access for all

A focus on access for people with disabilities is required to support their social and economic participation in public life.

Affordable and accessible transportation systems for all must be fostered through strategic public private partnerships to achieve economic vibrancy,

equity, and access to schools, jobs, and markets. Human mobility should be prioritized as a basic human right through a convenient and reliable public transportation service focusing on women and children's mobility needs in line with Article 13 of the Universal Declaration of Human Rights.

5. Sustainable funding solutions

Funding is a transversal element that affects the implementation and operation of all potential solutions to sustainable transportation. Sustainable funding sources, such as Foreign Direct Investment and Overseas Development Assistance, need to be independent of private interests. Funding assessments need to be conducted in a holistic manner, including social, environmental, and economic attributes.

Sustainable funding is recognized as a cross-cutting intervention achieved by the establishment of diversified funding sources through fostering of access to international financial climate mechanisms.

Sustainable funding involving national, international, private, and PPPs need to involve the following:

- clear analysis of the financial benefits and risks to the parties involved;
- fair distribution of financial benefits and costs;
- funding streams that do not abruptly dry up;
- repayment of loans needs to be achievable;
- project implementation should complement and not compete with local development opportunities; and
- life cycle analysis of the project/investment.

POTENTIAL SYNERGIES AND TRADEOFFS

Synergies

Sustainable funding solutions can prioritize safe, secure, affordable, accessible, efficient, and resilient transport policy interventions by prioritizing NMT infrastructure.

By increasing investment in NMT infrastructure and services, both the number of users and usage rate will increase, and communities will be safer and economically more vibrant because of the

increased use of public space and access to a more disposable income.

Spatial transformation (TOD) encourages NMT infrastructure and services by fostering high-density cities and mixed-use development.

Trade-offs

The security of people could be at risk if NMT infrastructure is built and promoted without correspondent focus on road safety conditions and personal safety.

Urban planning and spatial transportation using TOD may not provide universal access for all if the cost/benefit analysis does not appropriately factor in cost and benefit.

Sustainable funding solutions may not necessarily strive for accessible, affordable, and safe transportation systems, but rather prioritize efficiency and competitiveness.

CROSS-CUTTING SPECIFIC PROJECTS

The second workshop identified specific focus areas that would support the achievement of high-priority interventions:

1. Need for reliable, updated primary data on personal and freight transportation for all the regions of SA: these data should include a situation analysis on infrastructure, suppressed demand, and migration patterns. New technologies (e.g., GPS, ICTs, GIS, and IoT) along with strategic partnerships with private corporations could be useful in collecting real-time reliable data.
2. Short- and long-term travel and safety studies for cities to support efficient and effective investment and policy making: delivering context-based studies for South African cities supports the strategic implementation of NMT infrastructure and TOD, policies, and interventions.
3. Public support for initiatives and interventions, most notably, from the taxi industry and commuters, is required. This will require significant investment in campaigns to influence public attitudes and behavior.

4. Promoting accessible NMT through the planning and implementation of walking and cycling facilities using universal design principles.

5. Investment in intelligent traffic and land use enforcement (telematics or appropriate technologies) could potentially lead to safer streets: the use of technologies could foster a strategic collaboration between public transport operators, housing developers, and city planners to achieve mixed land use and access to land for all.

CONCLUSIONS

Policy supports the implementation of sustainable transportation in South Africa, where issues of road safety, security, public benefit, and sustainability need to be addressed in innovative ways involving stakeholders. Sustainable funding appears to be a significant challenge for the implementation of transportation projects, while also being identified as a cross-cutting intervention. Primary reliable data is required to enable planners to forecast and track the effects of transport interventions and prioritize elements. Sustainable transport interventions in South Africa have the capacity to impact over 13 SDGs and more than 25 targets.

ACKNOWLEDGMENTS

This policy research was carried out as part of the project "Development Strategy for Urban Sustainability in Africa on the Basis of SDGs Interlinkage Analysis (USiA Project, 2018-2019)" with financial support from JICA. We are particularly grateful to Africa Department of JICA, and those who have participated in the workshops in Ghana, Malawi and South Africa.

REFERENCES

- Abe, E. (2013). endorsed by: Institute for Transportation and Development Policy TOD Standard , 3rd ed. New York: ITDP, 2017. TOD Standard, 3rd.
- Haven, N., Springfield, H., & Program, R. (2015). TRANSIT - ORIENTED DEVELOPMENT (TOD) SUCCESS STORIES Benefits of TOD Community Benefits.
- United Nations (UN). (2016). Mobilizing Sustainable Transport for Development, Analysis and Policy Recommendations from the United Nations Secretary-General's High Level Advisory Group on Sustainable Transport, New York City.