

SOUTHERN AFRICAN SOLUTIONS TO PUBLIC TRANSPORT CHALLENGES

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ABSTRACT

Public transportation is a generic term used to describe the family of transit services available to urban and rural residents. Thus, it is not necessarily a single mode but more often a variety of traditional and innovative services, which should complement each other to provide system-wide mobility. There are three primary modes in the realm of public transportation; mass transit, paratransit and ridesharing (Hangula 2016). Mass transit which is characterized by routes, published schedules, designated networks, and specified stops, assisted by Intelligent Transport Systems- enabled infrastructure, is the proposed solution discussed in this paper. Mass-transit vehicles include buses, light rail or rapid transit, which either share space in mixed traffic or operate on grade-separated rights of way.

From the beginning of history, human sensitivity has revealed an urge for mobility, leading to a measure of society's progress. The history of this mobility or transport is the history of civilization. For any country to develop with the right momentum, modern and efficient transport should serve as basic infrastructure.

Transport plays a major role in urban development, by providing access for communities to schools, jobs, health care, and other vital services. Especially in developing cities and towns in Southern Africa, enhanced mobility for the needy groups is one of the most important preconditions in improving the standards of living. Cities that have high quality transport systems, which prioritize public transport and non-motorized modes rank at the top with regards to quality of life.

TRANSPORT SITUATION IN SOUTHERN AFRICA

Most countries in Southern Africa have made the effort make public transport an appealing option to travelers. In 2014, the Namibian government rolled out their Sustainable Urban Transport Master Plan (SUTMP) for Windhoek and the MoveWindhoek project, built around making public transport accessible to the rural and urban communities around Windhoek (Starkey, Ambunda 2017). In South Africa, Gautrain has revolutionized how

passenger rail networks are being run in Southern Africa, through Private- Public Partnerships, to provide an efficient and effective system aimed at benefitting all stakeholders involved.

While effort to provide world- class public transport is ongoing, urban transportation systems in most Southern African countries are far from ideal. The most visible and frequently mentioned transport problem of a town/ city in Southern Africa is traffic congestion, and it is well known that high levels of congestion create significant impact on the local and national GDP. Accessible and affordable public transport services are lacking in most Southern African urban and rural areas.

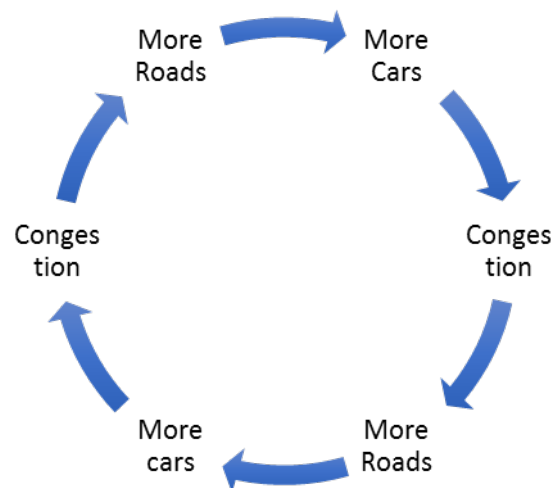


Figure 1 Vicious Cycle of Car- orientated Transport Development (Buis 2009)

With rapid urbanization and economic growth, motorization has been accelerating in cities and towns across Southern Africa. The total number of motor vehicles in many cities has more than doubled in the last 20 years, causing severe congestion (Wards 2013).

This has caused many cities in Southern Africa to follow a car- orientated transport development pattern, which has been followed in developing countries in the past. This system is illustrated in Figure 1. Jiemian (2011) states that many cities having recognized the importance of public transport and non-motorized transport, and the less sustainable nature of an automobile orientated transport system, they are now trying to recover from a car dominated development era, by halting the building of more infrastructures for private vehicles and re- allocating space to public transport infrastructure.

In most cities in Southern Africa, policies are largely in favor of “traditional road engineering”, which promotes cities to build their way out of congestion by constructing more roads for private motor vehicles, which tends to be a short term solution in most cases to try and counter congestion. These policies have failed to cope with the ever increasing demand that comes with increased motorization, as has been shown in many cities worldwide.

LAND USE AND TRANSIT

Transport character and city character are interlinked. Land use characteristics of a city can determine the type of public transport system it needs, and once a transport system is put in place, it influences land use characteristics of the city over time. Therefore, the type of public transport system a city puts in place should depend how the future of the city is planned. Population density also plays a huge role on the kind public transport system that can be put in place for the different areas. Cities with a high population density are able to introduce high capacity transit systems, as they are able to sustain their operations. These systems also tend to boost the economic activities in and around these cities.

Due to the way economic activities are spread out in towns and cities in Southern Africa, public transport is in most cases unappealing to users as they still have to walk long distances from stations to their places of work or to other vital services. It has then developed an image of being the only option for those who cannot afford a personal vehicle, due to the inconveniences that comes with it. There needs to be a paradigm shift to make it more appealing people of all income levels in society. Making public transport more accessible to rural and urban communities through integrating sub-urban public transport services with intra-urban systems, assisted by Intelligent Transport Systems-enabled infrastructure to boost efficiency and effectiveness will help in improving its image by curtailing most of the drawbacks it currently experiences in Southern Africa.

SOUTHERN AFRICAN TRANSPORT VISION

There exists a need in Southern Africa to involve rural and urban communities in all economic activities, this will involve designing efficient public transport systems with a focus beyond the urban areas, to integrate the needs of all communities.

The future of public transit systems lies in connecting rural communities to urban areas and running a mass urban public transport system that is able to connect to schools, hospitals, work and all other vital services, with the assistance of Intelligent Transport Systems (ITS). The proposed transit system is illustrated in Figure 2, which shall be assisted by ITS-enabled infrastructure, this will help in reducing delays and making sure that all stakeholders are informed should there be any inconveniences experienced. Smart scheduling is the key to connecting all these modes of public transport.

ITS refers to any information/communications technology that improves the functioning of a transport system. ITS will greatly improve the public transport system in Southern Africa by ensuring a seamless journey and quality travel for those using the public transport system.

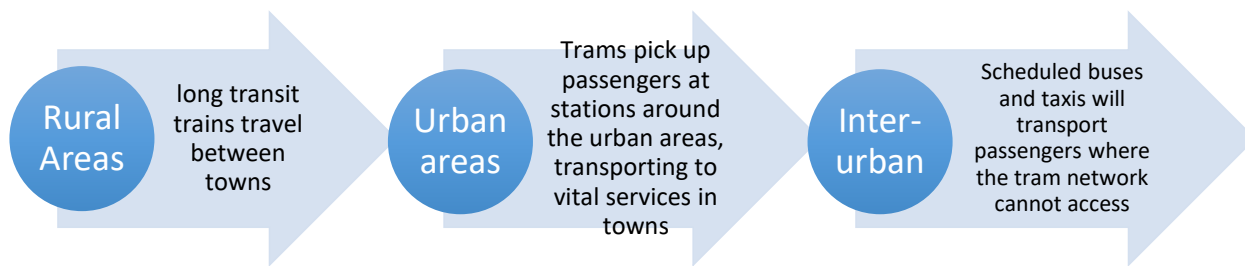


Figure 2 Transport system

Public transport should not be viewed as only for the poor as mentioned earlier, rather as an attractive mobility option for all income groups. In addition to affordability, improving efficiency and providing a flexible framework within which all users can use the system comfortably and confidently, lies at the center of making this integrated public transport system attractive to all.

The catchment area will include urban areas in Southern African, and the rural areas that surround them. Scheduled transit trains will travel on a determined basis from outside the cities into urban areas. At the stations, commuters are then given access to the tram network which takes them to the most important parts of the city, like the central business district, hospitals, police and other vital services. Another inter-urban form of transport will be buses, these will be able to access areas which the tram network is not able to access. All these modes should be fitted with para-transit facilities so as to accommodate everyone in society.

The integrated public transport system, in addition to serving high density areas in Southern African urban areas, will serve low and medium density urban and rural areas, by offering a convenient option for vehicle owners who do not wish to drive and an essential service to those without access to automobiles. In order to attract more users, extra road user charges should be put in place for those choosing to use private vehicles, namely "place of use" charges, to deter private vehicles from entering city centers prone to congestion. These vehicle restrictions will assist in increasing the demand for a public transport system.

An integrated ticketing system should be put in place for users to be able to buy one ticket, which they should provide as proof to the operators in the system, for the trip they intend to take, instead of buying tickets for the different modes they need to take (smart ticketing), while carrying out their errands. This assists in saving travelers time while using the public transport system.

An Intelligent Transport System should be incorporated into the transit system so as to inform operators when they are behind schedule (delays), and for the users to know exactly when the mode of public transport they are using is arriving (relaying of real-time information), this allows all stakeholders to be informed on the status of the transit system, so as to cut back on inconveniences. Figure 3 below shows how ITS-enabled

infrastructure can be incorporated in the public transport system (European Commission 2015).



Figure 3 Application of ITS (Shutterstock 2013)

This system should be put in place in collaboration with all stakeholders in an integrated public transport system, so as to develop a system that is efficient and effective in providing an attractive service, whilst benefitting all transit operators and facility providers.

Government policies should be encouraged to aim at channeling more funds into building up infrastructure for public transport, this indirectly puts constraints on the consumption and use of private vehicles.

Substantial funding and changes to the transport regulations in Southern Africa will have to be made, in order to implement this integrated transport system on a large scale, enabled by an ITS- system.

RECOMMENDATIONS FOR SOUTHERN AFRICA

A study should be done on the traffic flow between rural and urban areas around Southern Africa, to assist in choosing the right public transport system and to build up a strict schedule, which is convenient and allows all users to feel prioritized, regardless of the different activities they partake in.

Combining all these forms of transport modes will enable the public transport system to transport passengers from origin to destination without the need for long walking trips, as the changes in modes from the feeder trips in the system involve short walking distances and short waiting times due to the integration of ITS in the system. This integrated public transport system should provide proximity to origin and destination points for all commuters, which will be a strong determinant for a commuter's likelihood to use the transport system. This system is aimed at reducing the use of private motor vehicles in congestion prone areas in the urban areas, and to move society towards public transport systems and non- motorized forms of mobility.

The future of public transport in Southern Africa should start with improving the efficiency and effectiveness of the systems in place and those that will be introduced, with the assistance of Intelligent Transport Systems- enabled infrastructure. Buses and trains running late or not showing up at all serves as a form of “self-sabotage” to the authorities and operators trying to compete with the private vehicle users.

Implementing such a system will have to start with stakeholder consultations, and changes in government policies to encourage public transport as the choice of mobility. A large financial commitment will have to be made towards building up the new public transport system, which may well be possible through Private Public Partnerships (PPP's). All in all, the future of Southern Africa's transport lies in establishing a functioning public transport system.

Key words: *Intelligent Transport Systems (ITS), Public Transport, Integrated Transport System,*

REFERENCES

BUIS, J., February 2009. A New Paradigm for Urban Transport Planning, *4th Regional EST Forum in Asia*, 23 February 2009 February 2009.

EUROPEAN COMMISSION, 2015-last update, Intelligent Transport Systems. Available: http://www.urban-mobility-solutions.eu/fileadmin/editor-content/Deliverables/Factsheets/Cluster_1_Public_transport/SOLUTIONS-factsheet-1-6-Intelligent-Transport-Systems.pdf [19 March, 2017].

HANGULA, W., 2016. *Traffic data analysis for the recommendation of the implementation of a public bus transportation system between the towns of Ondangwa and Ongwediva*. Ongwediva, Namibia.

JIEMIAN, Y., 2011. Chapter 4-Sustainable Urban Transport. *Shanghai Manual- A guide for Sustainable Urban Development in the 21st Century*. United Nations.

SHUTTERSTOCK, March 19, 2013-last update, Public Transport on the Streets of Hong Kong. Available: <https://www.shutterstock.com/image-photo/hong-kong-may-14-undefined-group-59112976?src=V-wr44fMMUWI3f0y7DBMIw-1-11> [19 March, 2017].

STARKEY, P., AMBUNDA, R., et al, 2017. Promoting rural access and mobility in Northern Namibia: An integrated approach, Accepted for inclusion at the *8th Africa Transportation Technology Transfer Conference*, 8- 10 May 2017.

WARDS, 2013-last update, Motorization Rate Available: <http://www.oica.net/category/vehicles-in-use/> [19 May, 2017].