

## Case Study 13.2 Bus Rapid Transit in Lagos and Johannesburg: Establishing Formal Public Transit in Sub-Saharan Africa

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<b>Keywords</b>	BRT, Africa, mobility, emissions reductions
<b>Population (Metropolitan Region)</b>	Lagos: 21 million (Lagos State, 2013) Johannesburg: 7.2 million (Statssa, 2015)
<b>Area (Metropolitan Region)</b>	Lagos: 3,569 km <sup>2</sup> (Lagos State, 2013) Johannesburg: 6,009 km <sup>2</sup> (Statssa, 2015)
<b>Income per capita</b>	Nigeria: US\$2,450 South Africa: US\$5,480 (World Bank, 2017)
<b>Climate zone</b>	Lagos: Aw – Tropical savannah Johannesburg: BSk – Arid, steppe, cold (Peel et al., 2007)

Formal public transit remains virtually nonexistent in Sub-Saharan Africa (UN-Habitat, 2013), although this is beginning to change with recent and planned implementation of Bus Rapid Transit (BRT) systems in the region. The pioneers of this movement toward formal mass transit are the cities of Lagos and Johannesburg, the latter of which is credited with launching the first BRT system in the region only because the (slightly) older system in Lagos is described as BRT “lite.” This distinction exists because the Lagos system was designed to capture most of the desirable traits of BRT while requiring less capital investment, making the project feasible for the city. The result is a high-quality system at US\$2.75 million per kilometer, or half the cost of the usual BRT system (UN-Habitat, 2013). This increase in affordability is balanced by slightly slower transit times and lower capacities due to the lack of separated busways and other capital-intensive infrastructure changes, but the net gains for passengers remain substantial. In both Lagos and Johannesburg, informal taxis and minibuses dominated the public transport sector, usually exacting high fares and lacking in efficiency. BRT has improved economic, environmental, safety, and other outcomes for residents in both cities.

In Lagos, the BRT “lite” corridor opened in 2008 with a planned capacity of 60,000 passengers per day, a number that had reached 220,000 per day in 2010 (UN-Habitat, 2013). The World Bank provided technical advice and US\$100 million in financing, with Lagos state providing US\$35 million (World Bank, n.d.). To complete the financing and operation of the system a public–private partnership was established where the Lagos transit authority (LAMATA) provided facilities and terminals while private operators bought and operated the buses (World Bank, n.d.). The result for passengers was a 30% decrease in average fares, a 40% decrease in travel time, and a 35% decrease in waiting times (UN-Habitat, 2013). The buses are responsible for 25% of all trips along the BRT corridor

while representing just 4% of total vehicle traffic (World Bank, 2015b). As a result, CO<sub>2</sub> emissions have been cut by 13% and overall GHG emissions by 20% according to LAMATA (World Bank, n.d.). The BRT corridor has also created direct employment opportunities for 1,000 people and indirect employment for 500,000 (UN-Habitat, 2013).

Launched in 2009, the Rea Vaya BRT in Johannesburg was the first full BRT system in Africa (Allen, 2011), and cost US\$5.5 million per kilometer to construct (UN-Habitat, 2013). Rea Vaya was born of a transit plan by the city of Johannesburg with a goal of having 85% of residents within 1 kilometer of a BRT trunk corridor or a feeder route (City of Johannesburg, 2013). The awarding of the FIFA World Cup to South Africa in 2010 also provided motivation to get formal public transit systems up and running in host cities (Carrigan et al., 2013; UN-Habitat, 2013). Funding was achieved chiefly through fiscal transfers from national to city government in the form of a transport infrastructure grant. In 2011, the first phase of Rea Vaya was completed at a length of 122 kilometers and carried 434,000 passengers per day (UN-Habitat, 2013). Rea Vaya passengers reduced their travel times by 10–20% based on surveys, and a study by EMBARQ (Carrigan et al., 2013) shows that travel time savings and avoided road fatalities were the chief benefits of the BRT system, accounting for 30% and 28% of total benefits, respectively. Johannesburg launched the second phase of Rea Vaya (Phase 1b) in 2013, and it has registered both phases with the Voluntary Carbon Standard. The expected emissions reductions from the two phases are 400,000 metric tons of CO<sub>2</sub> over a 10-year period (Swiss Association for Quality and Management Systems, 2011).

Both cities are currently expanding their BRT systems, with Lagos planning on adding 13.5 kilometers to the existing corridor and Johannesburg constructing a third phase to service the northern parts of the city (C40 Cities Climate Leadership Group, 2013; Carrigan et al., 2013). Stakeholder engagement was key for both cities – in Johannesburg, the emphasis was on including existing taxi operators in the development and ownership of Rea Vaya to lower resistance and to lessen the impact on livelihoods of those in the transit sector (Allen, 2011). To make up lost revenues as taxis were taken off the road, taxi operators were offered ownership stakes in the Rea Vaya Company as compensation, and taxi drivers were retrained and absorbed into Rea Vaya as bus drivers (Allen, 2011).

In Lagos, community engagement was a key factor in building demand for BRT because there was a history of poor transport system delivery in the city and an overall lack of experience with formal public transit (UN-Habitat, 2013). LAMATA also worked to build a partnership with the National Union of Road Transport Workers, forming a cooperative to manage the BRT and building knowledge on the benefits of formal mass transit (World Bank, n.d.). The success of Lagos and Johannesburg in providing clean, efficient, and affordable public transit while working with the community and the dominant informal sector demonstrates a path forward to the rest of the continent to enhance mobility for urban residents while also improving the economic, environmental, and safety outcomes of transit.

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