



Best Practice: Bus Rapid Transit System

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CITY: JOHANNESBURG

POLICY AREAS: CLIMATE CHANGE; TRANSPORTATION

BEST PRACTICE

Launched in 2006, Johannesburg's **Rea Vaya**, which means "we are going," is the first **Bus Rapid Transit (BRT)** system in South Africa. The Rea Vaya is a joint project between the City of Johannesburg and private partners. The development of low-carbon transport in Johannesburg has positioned the City as a leader in tackling climate change and now serves as an example for other African cities.

ISSUE

With increasing congestion on the roads, a rapidly growing population and an inadequate public transportation system, Johannesburg has faced the challenge of developing new transportation solutions that would not only be safe, affordable and fast, but would also improve the quality of life of its residents. In an effort to improve public transportation and address safety issues, and accelerated all the more by preparations for the 2010 World Cup, the City of Johannesburg launched a transportation action plan in 2005 to move toward a more sustainable, low-carbon transport system.

GOALS AND OBJECTIVES

By 2020, the City plans to roll out 122 kilometers (75.8 miles) of mainline BRT corridors served by 150 stations and 250 kilometers (155.3 miles) of formal feeder routes. The long-term objective is to provide a network of some 330 kilometers (205 miles) of lanes that are easily accessible to more than 80% of the people of Johannesburg.

The BRT network sets out to provide speedy, efficient and affordable buses for commuters. It impacts economic growth by increasing mobility and reducing congestion and the cost of transport for businesses and residents. There are short-term, medium and long-term benefits to the BRT system:

Short Term Benefits:

- Efficient, reliable and frequent services
- Affordable fares
- A safe and secure public transport system
- Accessible public transport for the disabled, elderly and mothers with children
- A decrease in road congestion, energy consumption and vehicle emissions
- An enhanced urban environment
- Recapitalization of the public transport fleet

Medium-Term Benefits:

- Containing urban sprawl (spread of settlements)
- Promoting social inclusion instead of isolation
- Direct and indirect job creation in both the transportation and construction industries

Long-Term Benefits:

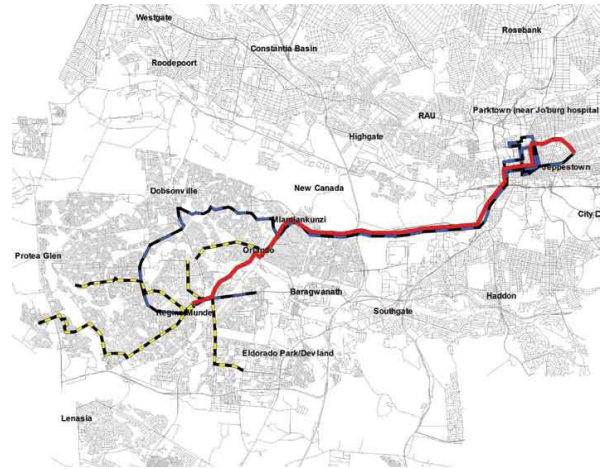
- Economic development in and around the areas of BRT operation
- Reduction in pollution
- Growth of a united, inclusive Johannesburg
- Reduction of harmful pollutants and greenhouse gases

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IMPLEMENTATION

A key component of the development of the Rea Vaya BRT network was to ensure the system would feed into existing transport networks. A BRT feasibility study was carried out in 2006 after an initial study tour by political and administrative leadership and key public transport operators. In August 2007, city leaders visited Bogota and Pereira in Colombia to study that country's BRT system, TransMilenio, with the aim of learning from its best practices. The Johannesburg delegation included representatives of taxi associations, technical advisors and government officials. The aim of the visit was to learn from the Colombian model so that it could be adapted to meet the specific needs of Johannesburg.

The Rea Vaya network has buses running along dedicated lanes and specific routes, and it is fully integrated into Johannesburg's public transport infrastructure, including Gautrain and Metrobus.



Rea Vaya Phase IA implementation

Partnering with the Taxi and Bus industries

In recognition of the significant role that the taxi and bus industries play in the country's economic growth, the City rolled out the Rea Vaya system together with affected taxi and bus operators. In 2007, as the BRT was taking shape, the City signed a number of agreements to ensure that key players in the public transport sector were committed to the improvements of the overall system. In October 2007, a Memorandum of Understanding was signed with the Top Six Taxi Association and in September 2008, another was signed with key operators in the bus industry—Metrobus and Putco. On January 27, 2010, another significant agreement was reached between the representatives of the affected taxi operators and the City of Johannesburg. The Participation Framework Agreement outlined a process for which taxi operators could turn in their vehicles and become shareholders in the Bus Operating Company. This paved the way for the removal of 585 taxis from the roads. At another level, the University of Johannesburg has designed a business development program in collaboration with taxi associations to equip their members with business management skills.

Construction and Design

Rea Vaya gives commuters world-class public transport at very competitive prices. The Johannesburg Roads Agency (JRA) is involved in the implementation of the electronic components of the project – such as the fare system, the passenger information system and the global positioning system. There will eventually be bus stations every 500 meters, with security officers and closed-circuit television (CCTV) cameras linked to a BRT control room.

Furthermore, all Rea Vaya buses have been specifically designed to make it easier for people with disabilities to use. This is the first time in the history of South Africa's public transport system that people with disabilities are able to use the commuter system with relative ease and independence. Buses have been designed with handrails, access ramps, chair lifts and designated spaces for wheelchairs. Audio prompts and special lights have also been installed for the hearing and visually impaired.

Launching the Rea Vaya

Starter services began on August 30, 2009 where people could ride the bus for free to mark the day. The service began as a starter service with only 40 buses running along 25.5 kilometers (15.8 miles) of newly developed bus lanes and stopping at 25 stations.

The starter service is run by an interim company or Special Purpose Vehicle. The SPV is 100% owned by a trust, the beneficiaries of which are the taxi operators affected by the development of Phase IA of the system. Following the initial phase, a fully-fledged Bus Operating Company (BOC) is expected to take over. The BOC, which will ultimately own and manage Phase IA of Rea Vaya, will consist of taxi operators previously operated minibus taxis on these routes. This new

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company will own and operate the buses while the City determines the schedule, does the marketing, and maintains the station and roadways.

The first phase (1A) incorporates a bus-only route service from Soweto to Ellis Park, on the eastern edge of the inner city. The route passes stations at Orlando Stadium, Westgate, Chancellor House, Beyers Naude Square, Carlton Centre, Fashion Square, Johannesburg Art Gallery and the University of Johannesburg's Doornfontein campus. Phase 1B will run from Soweto past the universities of Johannesburg and the Witwatersrand, through to Sandton; phase 1C will run in an east-west direction from Alexandra to Cresta.

Complementary buses will be able to operate on the dedicated BRT bus lanes as well as on normal city roads. They will take approximately 71 passengers with dedicated seating for the infirm, elderly, pregnant women and one wheelchair user. They will have on-board CCTV cameras, audio visual display systems and electronic doors on both sides.

Paper tickets have been initially sold at the various stations and by agents around the stations and Central Business District bus tops. A smart card will be in place in the near future, smoothly linking other systems like Gautrain and Metro Rail. The present bus fares are R10.50 (\$1.40 USD) for a combination of services; a bus-only route trip will cost R7.30 (\$0.97 USD) and an inner city trip will cost R4 (\$0.53 USD) (R=South African Rand).

Training Drivers

The 40 buses initially used on the bus-only and circular inner city routes were solely driven by 75 former taxi drivers, selected and trained over a one-month period by skilled Scania and Metrobus instructors. These drivers operate the latest transportation technology features including having access to a GPS system, panic buttons, route and destination screens, a public address system and CCTV cameras.

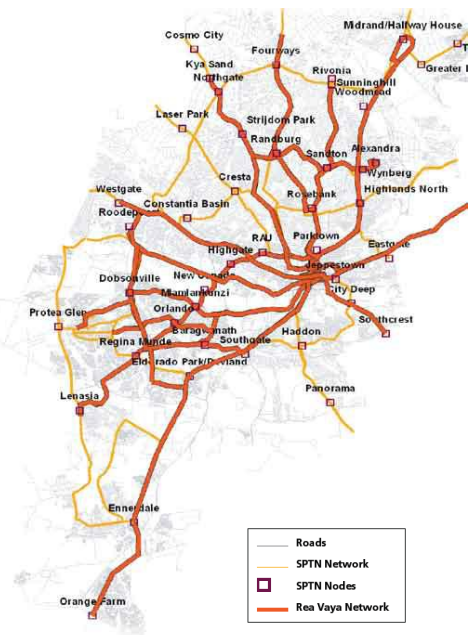
An additional feature of this high-tech system is the Automatic Passenger Management System (APMS). Drivers will also be able to communicate and manipulate traffic signals, switching red lights to green, lengthening the period for green lights, even shortening the period for a red light - all so that they are able to run their buses on schedule. The APMS has been fitted to all the vehicles and will be fully operational when the back office and control centre are complete.

Public education campaign

More people die in traffic accidents than from malaria each year in the developing world. At present, 1.3 million people die a year in traffic accidents globally, most of them in middle- to low-income countries. That figure is expected to increase to 1.9 million by 2020.

October is Public Transport Month in South Africa and it is used to educate people about transport and safety issues, and its impact on the environment. The program was launched in 2007 and since then, the City has worked intensively to raise the profile of road safety and other transport-related issues and has, through these initiatives, laid the foundation for the following year's events. In 2009, the theme was "Safety in All Modes of Transport: Systems Readiness for 2010."

Johannesburg's transport programs included its Transport Values, established to teach people about the smooth operation of transport to promote ridership. The values emphasized the need for people to be accountable for their actions, to co-operate with other road users, to be honest in all they do, to respect others, and to acknowledge others. The City's Transport Values, which can be seen on the City's Metrobuses, were made public in 2007 with the aim of getting road users to consider their behavior. The five emblems depict the Johannesburg Department of Transport's key values.



Map of BRT and SPTN Road Network

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Preparation for the 2010 FIFA World Cup

The Rea Vaya transported football fans from around the city during the 2010 FIFA World Cup. The City moved tens of thousands of spectators speedily and safely to both Ellis Park and Soccer City during match days. Johannesburg successfully completed the two stations at Soccer City to match the style and grandeur of the rest of the stadium precinct. One of the two stations was situated on top of the Soweto Highway, allowing pedestrians to travel through the longest man-made tunnel in Johannesburg under the freeway into the north side of the stadium.

COST

The development of the Rea Vaya system is the largest public transport project undertaken by the City of Johannesburg with a capital expenditure of R3.5 billion (\$467 million USD). As part of its long-term financing plan, the City has applied for the designation as a Clean Development Mechanism (CDM) project under the United Nations Framework Convention on Climate Change (UNFCCC) along with federal funding for the project. The City plans to engage in the carbon market, an essential funding source for future project development. Johannesburg is following the methodology of Latin American cities that applied and were granted status for similar projects.



Construction on the Rea Vaya Project

RESULTS AND EVALUATION

Commuters

Even after the 2010 World Cup, Rea Vaya continues to have a positive effect on the lives of the people of Johannesburg, especially those in previously disadvantaged, marginalized areas, with praise for the speed of the trip, the comfort and the price. Passenger numbers are growing steadily. From September 2009 to October 2010, over 6.4 million people boarded Rea Vaya buses, an average of almost 500 000 passengers a month.

Job Creation

The Rea Vaya BRT project is not only about transportation, it's also about job creation. Workers in both construction and transportation can seek to benefit from this project. The Rea Vaya system provides many new opportunities for the citizens of Johannesburg in various different capacities and the first phase of construction led to the creation of 29,000 direct and indirect jobs.

Quarter	Number of Jobs Created
July - September 2008	173
October - December 2008	463
January - March 2009	1836
April - June 2009	2803

Environment

The BRT system is the single largest transportation initiative ever undertaken by the City of Johannesburg to address climate change and represents a major turning point in how the City deals with congestion, pollution and greenhouse gases as a result of transportation.

Rea Vaya offers an alternative form of public transport - fast, convenient, safe and affordable. This will lead people to switch from private to public modes of transport and ultimately alleviate congestion in and around the City.

By replacing poor quality buses running on poor quality fuel with Rea Vaya's brand-new fleet of buses, which will run on low-sulfur diesel and the most advanced pollution reduction equipment, air quality will be dramatically improved. An extensive

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study conducted to determine the implications that Rea Vaya will have on greenhouse gas emissions and the environment supports the implementation of the system.

A detailed analysis of on-the-ground passenger traffic conducted along the major bus-only routes revealed an expected saving of 382,940 tons of CO₂ equivalent emissions as a result of the implementation of the Rea Vaya system by 2010. Operation of a Rea Vaya system through 2020 was estimated to save 1.6 million tons of CO₂ equivalent emissions. Additionally, by using Rea Vaya's "green" buses, nitrous oxides will be reduced by thousands of tons per year and particulate matter, the most dangerous vehicular emission to human health, by hundreds of tons annually.

The City of Johannesburg worked closely with the Gauteng Department of Agricultural Conservation & Environmental (GDACE) in order to obtain environmental approvals for the construction of various sections of the Rea Vaya BRT system routes. Environmental impact assessments were carried out in order to ensure that construction would not negatively impact the City of Johannesburg.

TIMELINE

2005

- Study tour of BRT systems in Latin America

2006

- Johannesburg's public transport plan is unveiled

2007-2008

- MOU signs with taxi operator association

November 2008

- First BRT station unveiled

December 2008

- Website launched www.reavaya.org.za

August 30, 2009

- The Rea Vaya BRT system officially launched

December 2009

- 25.5 kilometers (15.8 miles) of bus lanes and 27 stations installed

January 2010

- Rea Vaya BRT system earns the City of Johannesburg a first place honorable mention in the Sustainable Transport Awards, given each year by the Institute for Transportation and Development Policy to a city that uses transport innovations to enhance mobility for residents.

March - May 2010

- Rea Vaya BRT system Phase I is operational. Feeder service is launched.

Recent Implementation Summary:

March 1, 2010

- C1 Dobsonville to Ellis Park Station (29 buses)
- F1 Naledi to Thokoza Park Station (4 buses)
- F3 Jabavu to Lake View Station (2 buses)
- F4 Mofolo to Boomtown Station (2 buses)
- T1 Trunk Route (4 additional articulated buses will be deployed)



Work on Phase 2 Continues

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May 3, 2010

- C2 Dobsonville to Maponya Mall (19 buses)
- F2 Protea Glen to Thokoza Park Station (19 buses)
- F5 Eldorado Park to Thokoza Park Station (8 buses)
- C3 CBD Distribution Service (6 - 8 buses)
- Last bus time stretched to 22:40
- Saturday and Sunday Services introduced on all routes

August 2010

- Rea Vaya's station art received a Business Arts South Africa (BASA) Award in the innovative category, a first for any municipality in the 13 years of the awards' existence.

June 2012

- An 18 kilometer (11.1 miles) second trunk route running between Noordgesig in Soweto to be completed along with the planning for a third trunk route between Parktown and Sandton, running along Oxford and Rivonia roads.

Plans for further phases will be detailed after the finalization of the next Integrated Transport Plan in 2011-2012. The latest data regarding travel demand and land use, and the context of a new Integrated Development Plan for the 2011 – 2016 term of office, will guide future decisions.

LESSONS LEARNED



Students Utilizing the New Transportation System

The key to developing the BRT system was to ensure that as many interested parties as possible were on board, especially taxi operators who would be impacted by the development of the system. The City emphasized that although there may be fewer taxis on the streets, the new system would create new jobs and the city was prepared to provide the necessary training for bus operators and managers.

During the first month of operation, the biggest challenge was to maintain bus schedules. Not all of the BRT lanes are completed and in some parts of the city Rea Vaya buses must use normal traffic lanes. Cooperation from other motorists and taxis is improving, but there has also been some use by

non-BRT vehicles of the dedicated BRT lanes. Private vehicles have parked at the bus stations, leading buses to load and off-load away from the station.

In order to successfully implement a BRT project, it is necessary to:

- Develop a robust business and financial model, and obtain buy-in from existing operators and financiers
- Train owners and operators in skills needed for successful BRT operations
- Educate users and potential users
- Ensure that the BRT system meets expectations, e.g. security, affordability, travel time savings
- Plan and implement under time pressure

TRANSFERABILITY

The Rea Vaya BRT is an innovative, high capacity, lower cost public transit solution that can significantly improve urban mobility.



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Cities committed to reducing greenhouse gas emissions can apply this model for quick results. They must be prepared to invest in creation of stations and terminals needed for a BRT system, develop designated and segregate lanes for system, and partner with the private sector responsible for operational aspects.

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This report is based on an exhibition from the 2009 Copenhagen Climate Summit for Mayors Future Cities Exhibition. Innovative initiatives demonstrating how cities around the world are combating climate change were on display. For more information, visit www.climatesummitformayors.dk.

Facts and figures in this report were provided by the highlighted city government to New York City Global Partners.