



Report

Metropolis Peer-Review-Training

Johannesburg, July 2013

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Executive Summary

The Berlin Metropolis Initiative 'Integrated Urban Governance — Successful Policy Transfer', carried out a Peer-Review-Training workshop in July 2013, working with the City of Johannesburg. The forum took place in conjunction with the Metropolis Annual Meeting in Johannesburg. Earlier, at the Metropolis meeting in Guangzhou in 2012, the mayors of Berlin and Johannesburg, Mr Parks Tau and Mr Michael Müller, had agreed to arrange this workshop in order to review the city's Bus Rapid Transit (BRT) system 'Rea Vaya'.

Preparation for the Peer-Review-Training process started with drafting the *Initial Report* and collating general information on Rea Vaya BRT and key issues such as background, objectives, features, implementation, financing, stakeholder involvement, performance, impacts and challenges. It was prepared by Ms Lisa Seftel, Executive Director Transport Department, City of Johannesburg, with her team, and was distributed to the peers prior to the meeting. Thus the peers had the chance to adjust their feedback to the questions relating to the improvement of the system, which were the central content of the *Initial Report*.

The Peer-Review-Training forum started with an introduction of the BRT to the peers during the site visits on the first day. The experts from Ahmedabad, Lagos, Mexico City, Berlin and Melbourne visited the Johannesburg Road Agency (JRA) building and the control room, went on a ride with the BRT to Thokoza Park in Soweto and visited the Meadowlands bus depot. Following the site visits, Ms Lisa Seftel and her team outlined basic features and details of the Rea Vaya BRT system in a comprehensive presentation. Rea Vaya was initiated in 2006 and after only three years in August 2009 the first dedicated trunk route was operationalised from Soweto in the south-west to the inner city of Johannesburg. Today this service carries 43 000 passengers per day and travels 6.5 million kms per annum on the trunk, as well as linking to feeder and complementary buses in mixed traffic.

Rea Vaya is one of the city's key programmes aimed at promoting social cohesion and boosting economic development. Given that the system will be expanded in October 2013 and in year 2015, a range of questions regarding the systems' future improvement was presented to the peers. The questions concerned a wide range of issues: infrastructure, operation and maintenance, ITS standards, contractual issues entailed in outsourcing of services to private companies, integration of land-use, transport planning, and environmental and cultural sustainability. The peers responded to the questions on the second day in their feedback presentations and discussions.

The main outcomes can be summarised as follows. As a legacy of the apartheid system, land-use patterns in Johannesburg continue to be spread out and socially divided. The areas between settlement areas have remained either dedicated to the mining industry or left behind as tailings dumps. The participants agreed that the Rea Vaya project has a high potential to contribute to a more compact and sustainable city. Encouraging developers to build with higher densities near the BRT corridor could intensify this potential, particularly if processes are put in place to attract public and private investment. Additionally, a development premium for the land along the corridor could be charged and used to subsidy future BRT/public

transport operations. Thus, the further expansion of the BRT could have a high impact on the quality of life, on accessibility and the environment in Johannesburg. To further maximise this positive development, the appropriate approach for further planning should be to think big and bold. The entire network should be planned now with the physical realisation of the plan happening over time. It should be planned as part of a network that links the main corridors and transport-oriented development nodes. Additionally, by seeking for support for low-emission buses, including support from national government in respect of the appropriate regulatory framework, positive impacts for the environment can be maximised.

The peers were very impressed with the high quality of the infrastructure of the Rea Vaya system. However, they suggested certain changes to achieve greater operational excellence, particularly referring to infrastructure and patronage. In relation to the docking infrastructure, they suggested 'closing the gap' between buses and bus docking-ramps through a series of low-technology solutions, combined with driver training. In relation to the issue of patronage being low, especially during off-peak hours, they suggested various measures including creating turn-arounds and reducing route lengths during off-peak hours; bringing people closer to the stations through appropriate infrastructure for cycling and walking; integrating the Rea Vaya with the informal transportation sector; and giving incentives for people to travel off-peak by providing more attractive tickets. A long-term measure could be to integrate land-use planning and transportation planning in the regulatory frameworks of the city. Increasing ridership could further be achieved by improving the visibility of the system. Thus campaigns should demonstrate and create pride in the system among Johannesburg's population. Moreover, new career paths should be opened for all workers from drivers, security guards, customer-care officers and monitors to bus supervisors, technical managers and managing directors. At the same time the system's performance should be constantly monitored, especially regarding contracting and management of the bus operations.

A key element in the process of improving the system's performance, and thereby realising the vision of a caring city, is to actively involve the users in all stages of the planning. It is important to hear their 'personal stories' and to learn from them. Involvement should also be extended to the operators. Johannesburg could connect with the informal sector and the mini-bus/taxi industry as a strategic partner by strengthening political engagement, support and trust-building.

In relation to the financial sustainability of the system, Johannesburg could explore options for cross-subsidising the Rea Vaya from private car use and developments along public transport routes. This could include revenues from park-and-ride charges, through setting a premium on development rights along the BRT corridor, by adding a fuel levy to other-vehicle use, or through project or development financing.

A key issue raised during the Peer-Review-Training forum was related to several levels of 'integration'. On a strategic level, it was suggested that the future planning of new BRT lines should only be for routes with an appropriate demand. Some routes might better be suited for other modes of public transportation. However, all modes should be connected and integrated in one system. On operational level, it could mean the introduction of new park-and-ride facilities to attract more private car-users for BRT, or the redesign of surrounding public spaces for use by pedestrians or cyclists. These interventions require strong coordination and

sound planning. Consequently, there is also a strong need for a clear policy and authority to transform the transport system, whether it is BRT or other modes of public transportation.

The Peer Review process has been accompanied by applying the Circles of Sustainability approach in order to elucidate critical issues that bear upon the success of Rea Vaya. The results underline the outcome of the Peer-Review-Training: 'If the Rea Vaya can change the spatial separation between the poorer south-west and the wealthier north; if the Rea Vaya can contribute to reducing carbon emissions and particulate emission, and decrease dependency on heavy fossil fuel use by cars; if the Rea Vaya can be part of changing how people move around the city—then it could potentially make a substantial difference to improving the ecological and economic sustainability of the city.' The method identified nine points where objectives pursued by the Rea Vaya are in tension. The most complicated issues are decreasing the cost of the overall service and decreasing carbon emissions.

The Peer-Review-Training was evaluated with a questionnaire. Its assessment confirmed several positive statements relating to the outcomes of the activity. It was a critical but open and constructive workshop in which various aspects of the planning, implementing and operating of BRT were mutually shared. Peer feedback was useful for the future development of Rea Vaya. Johannesburg is on the right track because BRT has and can have a big impact on accessibility, land-use planning and the economy.

The review also helped the peers. Common challenges have been identified and they learned from the sophisticated technical features, environmentally friendly processes, and up-to-date infrastructure of Rea Vaya, all of which will serve as good examples for the BRT in their home cities. All participants indicated that it would be useful to exchange more practical experience around BRTs beyond this workshop.

This perception was also shared by the participants in the 'Feedback Session on the Metropolis Peer-Review-Training' which was held on 18 July 2013 and which was open to all participants of the Metropolis Annual Meeting. After Ms Seftel presented the results of the Peer-Review-Training, and after a energetic open discussion with the peers and the audience, the Mayors of Johannesburg and Berlin agreed in their statements that the meeting brought many new and helpful insights for both, the hosts and the peers – and that Peer-Review-Training is 'a good and very well-designed method to organise and intensify exchange of experience between cities'.

Report

Background

The Johannesburg Peer-Review-Training was carried out within the context of the Berlin Metropolis Initiative ‘Integrated Urban Governance — Successful Policy Transfer’ in co-operation with the City of Johannesburg. The Mayors of both cities, Mr Parks Tau from Johannesburg and Mr Müller from Berlin, agreed at the Metropolis Board of Directors Meeting in Guangzhou in 2012 to organise this workshop conjointly in order to review the Johannesburg Bus-Rapid-Transit (BRT) system Rea Vaya at the occasion of the Metropolis Annual Meeting in Johannesburg.

The Peer-Review-Training format has been developed by the Berlin Metropolis team of the Senate Department for Urban Development and the Environment of Berlin, and was carried out for the first time in Berlin in the year 2011 and a second time in Paris Île-de-France in 2012. By bringing together experts with a similar background of experience and field of work — the peers — the peer review aims at identifying solutions responding to difficulties in carrying out a specific programme and to discern its positive trends. This way it functions not only as a method to improve a local programme or project, but also to document good examples for the practical guidance of the participating experts in their cities.

A key advantage of this method lies in the different geographical and cultural context of the peers. They are not necessarily familiar with the taken-for-granted concerns of the hosting city, and therefore are well placed to identify issues which local people frequently take as given. The Metropolis network builds an excellent framework for the application of this method.

Figure 1: Method of Peer-Review-Training



Peers and Respondents

At this year's assessment on 15–16 July in Johannesburg, peers from Ahmedabad, Berlin, Lagos and Mexico City discussed the Johannesburg BRT system, Rea Vaya. The participants from Lagos and Mexico City were representing their local BRT systems, whereas the peers from Ahmedabad and Berlin were representatives of the scientific sector. Prof. Lokre (Ahmedabad) is an experienced BRT researcher and consultant and Prof. Schwedler (Berlin) is an expert for governance in urban environments. The forum was moderated by Prof. Paul James, Director of the UN Global Compact Cities Programme. The contact person in Johannesburg was Ms Lisa Seftel, the Executive Director of the city's Transportation Department.

Ahmedabad

Prof. Abhijit Lokre,

Associate Professor at Faculty of Planning and Public Policy at CEPT University, Ahmedabad and certified trainer in 'Mass Rapid Transit Systems' by GIZ, Germany

Melbourne

Prof. Paul James

Director of the UN Global Compact Cities Programme and Director of the Global Cities Institute, RMIT University.

Mexico City

Mr Guillermo Calderón Aguilera

General Director, Metrobús, Mexico City

Lagos

Dr. Desmond Amiegbebhor Edenojie,

Deputy Director of Bus Services, Lagos Metropolitan Area Transport Authority (LAMATA)

Berlin

Prof. Hanns-Uve Schwedler,

European Academy of the Urban Environment, Berlin

The Initial Report

The programme was introduced by an *Initial Report* (see Annex) forwarded to the participants prior to the training workshop in Johannesburg. Together with general information on the Rea Vaya BRT (background, objectives, features, implementation, financing, stakeholder involvement, performance, impacts, challenges), the Initial Report contained key questions relating to the improvement of the system intended to be addressed during the workshop (see Box 1 below).

Box 1: Key Questions of the Peer -Review-Training

Sector	Issue
Land use and planning	How do we best integrate land-use, environmental and transport planning in respect of BRTs to achieve the City objectives of sustainable human settlements, local economic development and a low-carbon economy?
Active citizenry	How does and how can the BRT further contribute to empowerment of operators, transformation of the informal to the formal public transport sector and actively involve residents during the implementation phases as well as involving commuters in actively giving feedback to improve the service?
Operational excellence	How can the Rea Vaya BRT achieve operational excellence in all areas of operation, including roadways, stations, buses, depots and intelligent transport systems?
Skills and capacitation	How can Rea Vaya BRT be adequately capacitated and how can it contribute to skills development and capacitation across the transport sector?
Finances and funding	How do we achieve financial sustainability of BRT systems including in innovative ways such as through land-value capture and carbon-financing?

The Site Visits

After an orienting discussion, the workshop began with an on-site introduction to Rea Vaya by visiting relevant locations in the city.

At the **Johannesburg Road Agency (JRA)** building, Ms Christine Walters, Member of the Johannesburg Mayoral Committee (MMC) for Transport, welcomed the participants and pointed out that the Peer-Review-Training offers an excellent chance to learn for improving the BRT and to share experience. She also mentioned remaining challenges of the BRT system of which the transformation of the taxi industry plays a crucial role. The JRA building hosts the control room, in which the participants had the chance to get an impression on the monitoring, information-flow and intervention possibilities regarding the system.

Pictures 1 and 2: Technical visits to control room and bus station



The time spent at 'Chancellor House' bus station and on the trip to the final station at the end of the Rea Vaya line, allowed the participants to develop a practical understanding of the technical features of the stations, ticketing solutions, and buses, as well as reach of the urban area served by the system. The characteristic BRT features, such as the separated bus lanes or the centred bus stations were evident. Participants on the field trip later expressed that they were especially impressed by the modern design and the state-of-the-art environmentally friendly equipment. They singled out the solar-energy supply, natural ventilation, contactless ticketing with smart cards, and the real-time information panels of the bus stations.

Pictures 3 and 4: Well-designed and technically well-equipped bus stations



The BRT ride ended at last stop of the BRT line at Thokoza Park in Soweto. From here the group was brought to the final destination of the site visits, the newly opened **Rea Vaya Meadowlands Bus Depot** in Dobsonville, Soweto. This building mainly serves for maintenance purposes, but has also fulfils administrative functions and is the meeting point and office of the bus drivers. As with the bus stations, the depot is built according to state-of-the-art technological and ecological standards. Javier Cajiano, PioTrans's chief operating officer demonstrated the construction material, which consist of recycled plastic products, and the oil-water separator, which allows the recycling and reuse of the oil and water.

Pictures 5 and 6: Bus maintenance and drivers' schedules in the Rea Vaya depot



The use of the latest technology and the recycling processes throughout Rea Vaya were appreciated as exemplary by the peers.

The Rea Vaya presentation

After the site visits the BRT leader Lisa Seftel together with her team outlined details and basic features of the Rea Vaya BRT system in their presentation:

The city has 4.4 million inhabitants and a population growth rate of 3.4%. The city has a high proportion of poor people, with ca. 30% unemployment and with 67.4% of households with an income of less than R3 200 per month. The modal split assessed in 2002 shows that 47% of the 35 million daily trips are made with public transportation, whereas 72% of them are made with privately operated mini-bus fleets. Consequently, and in line with national and provincial planning paradigms, the city launched a Growth and Development Strategy (GDS) with a long-term vision until 2040 to make 'Johannesburg as a World Class African City of the future — a vibrant, economically inclusive and multi-cultural African city; a city that provides real quality of life, for all its citizens'. The main transit corridors for the BRT were thus named '**Corridors of Freedom**' — with a vision to integrate disadvantaged people by providing affordable access to mobility. This led the transport department to redefining its development goals:

- Building a leading, responsive and activist transportation sector in the city which works in partnership with stakeholders and residents;
- Planning, policies and co-ordination for integrated and sustainable transport;
- Promoting public transport, walking and cycling as modes of choice in Joburg;

- Building co-responsibility and a value-based culture to enable behavioural change towards transport issues;
- Providing high-quality, safe, accessible, affordable and environmentally friendly public transport services;
- Building, maintaining and managing our road infrastructure and systems to ensure safety, accessibility and mobility for all road-users including pedestrians;
- Transforming the construction, maintenance and management of storm water to respond to climate change and water scarcity and ensure the safety of residents and infrastructure; and
- Building, maintaining and managing public transport and non-motorised transport infrastructure to support walking, cycling and the use of public transport.

Concretely the city has set up a strategy to identify and map the whole network of public transport, freight, walking and cycling corridors and nodes, and to identify the most appropriate mode, routes and services that will be contracted or licensed to operate in each corridor. Over time it will construct and develop already-identified public transport corridors and focus on the Rea Vaya corridors. Integrated transport hubs will be developed and the surrounding public environment, in particular the pedestrian and cycling environment will be improved. Among other programmes and initiatives linked to the restructuring of transportation, the implementation of the first phase of the BRT system is a key programme to achieve the city's goals to promote social cohesion or to boost economic development around BRT. Rea Vaya was initiated in 2006 and three years later — in August 2009 — the first dedicated trunk route was operationalised from Soweto in the south-west to the inner city of Johannesburg. Today this Phase 1A service carries 43 000 passengers per day and travels 6.5 million kms per annum on the trunk, as well as linking to feeder and complementary buses that travel in mixed traffic. The decision on the selection of the route was influenced by the facts that it is a high-demand corridor which links Soweto to Sandton and thus the poor south with the rich north. Moreover, it linked the Soccer City and Ellis Park Stadiums to the 'accommodation hub' in Sandton during the FIFA World Cup in 2010. Currently the BRT covers 25 kms of a dedicated trunk route for 18-metre articulated buses

Box 2: Future implementation phases of Rea Vaya

Phase 1B	Phase 1C
To be operationalised in October	To be introduced in 2015
18 km of dedicated trunk route	16 km of dedicated trunk route
2 complementary and 5 feeder routes	3 complementary and 2 feeder routes
17 more stations	10 more stations
Anticipate 65 000 daily passengers	260 buses — fuel source to be determined
134 Euro IV buses	Up to 200 000 more passengers

The infrastructure of the BRT has been developed and implemented along specific philosophy and key guiding principles.

Box 3: Guiding principles and their application

Infrastructure guiding principles	Examples for their application include	Realisation of infrastructure guiding principle
<ul style="list-style-type: none"> • Standardisation • Simplicity, cost-effective and “modular” design • Capable of rapid implementation • Simplicity of operation • Ease of maintenance • Maximum utilisation of natural resources in buildings (light, ventilation) • Innovation • Specific “look and feel” for Johannesburg • Maximum utilisation of local resources and products • Maximum potential job-creation 		<ul style="list-style-type: none"> • Natural light and ventilation in all BRT-related buildings • Use of local material for construction in all BRT-related buildings • Use of recycled material for construction of bus depots • Use of local construction companies • Standardised design of bus stations • Use of state-of-the-art ITS and ticketing systems

To date the first BRT line is being operated successfully. In terms of the number of passengers (tickets sold) and the revenue return, there is a modest trend upwards. The buses drive with a peak frequency of two-to-five minutes and an off-peak frequency of ten-to-30 minutes. Depending on the route section and on the time of the day, the average speed differs between 11 and 34 kmph. Improvements have been attempted across the course of the Rea Vaya operation. However, only minor improvements could be achieved in increasing off-peak passenger numbers, in encouraging passengers to switch to off-peak use, or in attracting new public-transport users. Concerning the fuel source the city is intending to increase the number of dual fuel (diesel and biogas) buses. Changes have been necessary to respond to operating challenges. For example, the system was initially operated by the Bus Operating Company (BOC) Fanalca. However, due to a breakdown in the relationship, Fanalca departed. Thus the Bus Operating Contract Agreement (BOCA) has been adjusted from phase 1A to 1B. The changes are summarised in the following overview.

Figure 2: Features of BOCA: 1A and 1B (1)

Feature	1A	1B
Bus ownership	Operator owns buses	City owns buses for first five years and then buses can be transferred at fair market value to operator through MAT Regulations (Treasury decision).
Bus financing	BNDES financing arrangement. City provided hell and high water guarantee	No bus financing in first 5/6 years “Instalment sale” over rest of period – Senior Counsel opinion that this is doable in terms of MFMA No contingent liability No hell and high water
Bus operations	BOCA can only operate bus services as per schedule of the City	Ditto
Monitoring and step in rights	City has monitoring and step in rights – but not to take over the bus company but to ensure that another bus company takes over the operations to ensure uninterrupted service delivery	Similar monitoring and step in rights but modelled along new Companies Act provisions.

The management of the stations, including cleaning, cashiers, and security services, was initially outsourced. However, across the course of the first phase, the workers in these services have become city staff as part of the ‘Scheduled Services Management Agency’. In general their performance is good, but with continuing weaknesses in the area of maintenance. The operation is supported by an information technology system: the ‘Advanced Public Management System’ (APTMS), which includes an automatic vehicle-locator that feeds the passenger information systems. The system regulates traffic-signal priorities and supports surveillance and the scheduling system. Another ITS feature is the ‘Automatic Fare Collection’ (AFC). After a very long development phase, it is now the first automated distanced-based system in the world. Lessons learnt with its implementation were mainly to emphasise effective education of stakeholders and passengers.

Due to the immensity, complexity and time constraints of implementing Rea Vaya under intense pressure of deadlines linked to the World Cup, the emphasis was on technical and infrastructural considerations. Less attention was given to integration, institutional building and broad social sustainability. Thus various activities have been undertaken over the last year to change this emphasis:

The financial model of Phase 1B has been reviewed in order make it more sustainable and to reduce operational subsidies. Moreover a sustainability study for Phase 1C has been elaborated which took into consideration financial, land-use, public transport and environmental sustainability. As a result, measures were proposed to improve the BRT and its financial performance. Their objectives are to achieve the following:

- Maximise the transit-orientated potential of the corridor;
- Maximise integration at a strategic, route and operational level;
- Increase the number and length of routes to improve patronage in both directions; and
- Build on existing BRT features, but have fewer stations and introduce new infrastructure features such multimodal transport interchanges.

One other main activity has been to increase the pace of finalising a long-term Integrated Transport Plan which highlights the potential of the BRT as a catalyst for strategic, operational and modal integration.

Box 4: Levels of integration and objectives

Levels of integration		
Strategic	Operational / Modal	Infrastructure
Assigning modes for all routes of the transport network depending on demand and other circumstances	Integration with rail and conventional bus services	Retrofitting and rolling out non-motorised transport modes, including walking and cycling infrastructure
Integration of Rea Vaya routes with other modes and across Gauteng	Integration of BRT ticketing system with other modes of transportation	Introducing integrated transport infrastructure facilities such as terminuses and interchanges
Greater focus on planning, development control and public investment along public transport corridors		Initiating way-finding, signage and commuter shelters common to all public transportation modes, incl. Rea Vaya.
		Implementation of P&R facilities to attract car-users

Other important activities were to finalise an institutional form, to set up a scheduled services management agency and to align the functions of the Transport Department. The 'Rea Vaya journey' took the dedicated staff from five to 55 to 455 staff. The organisation changed from a service-provider manager to a manager of service-level agreements and contracts.

In relation to financial aspects a project has been undertaken to monitor and assess costs and revenues related to Rea Vaya. COJ in conjunction with United Nations Development Programmes (UNDP) did an economic analysis to identify and quantify the relevant economic costs and benefits associated with Phase 1A and B, and to determine the distribution of these benefits. The outcomes include some important considerations:

- An estimated 532,000 people are served by Rea Vaya, which is 5% of the total Johannesburg population;
- For every R1 m spent on infrastructure, 3.2 jobs are created in Gauteng;
- Transport-related quantifiable benefits include higher travelling speed, safer journeys and lower vehicle-emissions. Wider societal benefits include densification and land-use changes;
- Non-quantifiable benefits include accessibility and affordability, smart cities, and the transformation of taxi industry; and
- An increase in passenger numbers can improve the cost-benefit ratio, for example by an increase in off-peak passengers, an increase in users travelling in the opposite direction, and a transfer of private-car users to using the bus service.

During the presentation a range of questions regarding infrastructure, operation and maintenance, ITS standards, contractual issues with outsources companies, integration of land-use, transport planning, and environmental and cultural sustainability were presented to the peers. They were asked to respond to them on the following day of the Peer-Review-Training. The facilitator pointed out that the purpose of the workshop is to create a direct, critical and open dialogue about the strength and weaknesses of Rea Vaya rather than just to give technical advice.

The Feedback

The second day of the Peer-Review-Training started with the presentations by the peers. The peers addressed relevant experiences in their home cities and regions, and presented a range of observations and recommendations to improve the Rea Vaya BRT system.

Mr Calderón from Mexico City focused in his feedback on five aspects: land-use planning, active citizenry, operational excellence, skills and capacitation, and finances and funding. He illustrated his feedback on the questions related to Rea Vaya, presenting examples from the Mexico City BRT Metrobús.

The planning of new BRT lanes is strongly interlinked with land-use issues. They have great potential to increase the density of commercial or living areas along the BRT lines, and to upgrade deprived or abandoned areas. The example from Mexico City clearly demonstrated how the new BRT lines in the downtown and the related redevelopment of the streets, have led to the recovery of a positive urban environment in the historic district and to reversing the formally negative population trend in this area. By operating low-emission and energy-efficient services, as well as by achieving a modal shift to public transportation, he suggested, the BRT also has a positive impact on the environment in those areas.

Mr. Calderón recommended that citizens be involved even during the planning phase of the BRT. This could be carried out through their formal participation in the designing phase of the Transportation Master Plan or the City Development Plan. During the implementation of the project, information campaigns about the benefits of the system, such as in relation to safety, travel times and money savings, as well as construction details, are an effective way to promote the system. Further means of involving the public include carrying out opinion surveys, awareness campaigns and establishing a media strategy with communication via social media and call centers directly responding to suggestions and complaints.

Picture 7: Opening campaign of Mexico City's new BRT Line, Línea 4'

The advertisement for Mexico City's new BRT Line 4 features a map of the city with the route highlighted in green. The map shows the route starting from the airport and going through downtown. Text on the map includes 'Locate your stop', 'Regular fare: \$5.00', and 'You can purchase and recharge your cards at participating stores marked by'. Below the map is a red Metrobús bus. The main text of the advertisement reads: 'Mexico City Metrobús Only 30 minutes! From airport to downtown and back! Línea 4 safe fast comfortable'. It also includes 'Departures every 20 minutes Hours of service 4:30 am - 0:00 am' and 'Designated luggage space available'. At the bottom, it says 'Airport fare \$30.00'. Contact information for Metrobús is provided at the bottom: 'Cards: 5130.3597', 'Service and operation: 5761.6858 y 5761.6860 ext. 121 y 136', 'atencion_usuarios@metrobus.df.gob.mx', 'www.metrobus.df.gob.mx', and 'Metrobus Metrobus_GDF'.

To achieve operational excellence, all single features of the system have to be taken under consideration. Roadways, pavements, traffic lights, pedestrian and vehicular signals, and intersections, all need to be properly designed and built. The bus stations have to be designed according to the numbers of passengers forecast, using modular construction and by taking into consideration aspects of maintenance, cleaning and surveillance. Also, it is important to

equip bus depots according to the future fleet forecasts and to take into consideration the related increasing maintenance and surveillance tasks. Mr Calderón mentioned that good ITS systems and an emphasis on cleanliness have high potentials to increase the excellence of the systems performance. For example, graffiti should be removed within 24 hours.

In relation to skills and capacity building, the central issue is to carry out ongoing training programmes. Training is essential not only for the bus drivers but also for the public and private operators. Training for drivers should address safety and best-practice performance; operators should be made familiar with basic skills, technology management and key performance indicators. After successfully completion of training programmes, trainees should receive certificates in recognition of their achievements. In Mexico City more than 1 000 drivers participated in the 'Safety First' training.

There are several options that enhance the possibility of achieving financial sustainability for a BRT system. Mexico City has had good experience with fare and taxes policies which are oriented to public transport improvement. Private projects and public-private partnerships can also successfully contribute to public transport projects — such as through tolled highways, and housing estates and commercial development precincts around transport nodes. Another means of achieving financial sustainability is through fare cross-subsidies. In Mexico City this was applied to the Metrobús Line 4 infrastructure which was financed by a levy charged against tolled-highway users. Financial credits or lower interest rates directed at development funds oriented towards promoting environmental friendly technologies can contribute to sustainable financial models, as can the provision of spaces for paid advertisements.

At the end of the Peer-Review-Training Mr. Calderón handed over a paper with additional feedback. This is incorporated in the following summary.

Box 5: Additional feedback from Mr. Calderón

Additional Feedback		
Infrastructure	Operational / Modal	Others
Cycling lanes should be integrated to connect the bus line. It should be paved properly and penalties for misuse by car drivers should be issued	The fleet has a capacity of 2-3 times more users. To increase use of the buses they could be integrated in a network and at off-peak times reduced fare tickets could be offered.	Technology: It is better to apply already implemented technologies rather than pioneering ones. (Low floor vs. high floor).
The automatic doors at the stations seem to be unnecessary. The roofs should be translucent and made of polycarbonate panels.	Service reliability must be sought, even while strikes take place. BRT is a public service like fire and rescue services. To guarantee continuing operation, legislation might have to be changed.	Environment: BRT is a contribution to reduce green house gas emissions. It should be registered as a clean development mechanism of the UNO
The depot is modern and functional but seems to be oversized. It could offer potential for savings.	The minimum operational speed of the busses for BRT should not be lower than 20km/h.	Before contracting external operating companies it is important to carefully study their capabilities. Contracts should guarantee consistent or increasing revenues.

	Payment methods need to facilitate quick and efficient payments. The operating authority should own the rights of technical systems.	Safety can be increased by respective required qualifications of drivers, initial trainings and certifications.
	The tariff strategy has to be transparent and clear. Payment according to travelled distance seems justified from a technical point of view. A flat rate would offer advantages for people living in remote areas.	

Mr Abhijit Lokre from Ahmedabad, started his feedback comments by expressing his impressions of Rea Vaya after the site visits and the presentation.

Box 6: Impressions after site visits and presentation

Impressions after site visits	Impressions after presentation
High-quality infrastructure: including bus stations, workshop and depot, ride quality	Spread-out city; density very low
Very low off-peak ridership	One-direction peak demand creating lower load factor
Some problems with bus docking	Issues with negotiating with taxi operators
Minor problems of lane infringement	Buses going outside trunk corridor for long distance in phase 1C
Low/no development along highway	Spread-out city, density very low
	Low floor or high floor
	Very low speed (11kmph) in city centre.

His recommendations to overcome these difficulties and to make use of the successful features included the following considerations. It is advisable to create a network of BRT lines rather than corridors. This network will bring out full potential of BRTS and will allow for multiple routing options. While the physical infrastructure can be realised over time, the system should be planned in its entirety, and as soon as possible. It is not necessary in the first stage to build bus stations at locations without sufficient demand, but future spatial footprints can be designated in the plans, leaving space for stations to potentially be built after the development of these areas.

Further, the operation should be made more flexible. Since demand may vary according to time of day and across a corridor, it would be advisable to allow for turn-around facilities that help to shorten routes flexibly. Routing analysis of demand and supply according to different options, are a successful tool to plan a more flexible operation. Regarding the question concerning advantages and disadvantages

Picture 8: Example for a turn-around facility in Istanbul



of low-floor and high-floor buses Mr Lokre pointed to the high costs of low-floor buses and mentioned that they are not completely flat inside — the rear portion is not accessible. Bus stations can easily be adapted for either variation of the buses. Likewise bus drivers can be trained to operate both variations.

Bus docking at the Rea Vaya stations could be improved during the next phase of extension. It is observable that drivers shy away from specially constructed kerbs. The gap between the platform and bus door is wide when this happens. To minimise this gap, trials with different kinds of kerbs at new bus stations could be undertaken. The platform extension can be fitted with specially made rollers that roll along the bus surface when the bus touches them. Ramps to bridge the gap would be an additional solution but they are expensive and unnecessary.

Concerning the contracting of the bus operator, Mr Lokre recommended that the city reconsider the feasibility of mixed tendering and negotiation. Thus, the market could respond to a potential business and savings could be achieved. Other suggestions to increase financial sustainability included utilizing parking revenues, increasing land-value capture by increasing FAR (Floor Area Ratio) and allotting part of these revenues to a dedicated Rea Vaya fund. Revenues can also be attained by designating public land along the BRT corridor to create commercial or office space. Selling advertisement rights at bus stations, he suggested was a minor consideration with limited return.

His final recommendation was focusing on precinct-wide sign-posting as one possibility to increase the profile and the quality of the service. Sign-posting may be organised in an innovative or artistic way. An example of this is a public transport station in Dallas which has a sculptural map of the downtown area built into the floor.

Mr Desmond Amiegbebor from Lagos, gave his feedback from the African perspective. He mentioned that due to migration of people to the cities, public transit is facing significant challenges in most African cities. At the same time, energy prices are increasing and, as a consequence of recession, financial support by governments is decreasing. Thus, the challenge is to provide higher-quality service at greater efficiency to retain and attract new public-transport users and to provide affordable transportation especially for the poor. BRTs are the appropriate means of transportation because, compared to other public-transport modes such as tramways, light rail or metro rail, it is a less expensive and quicker to implement transit alternative. It potentially encourages community enhancements and economic development and bears environmental stewardship opportunities. Moreover, if planned properly, it can be profitably operated. Nevertheless, Bus Rapid Transit is facing challenges in metropolitan areas. It has to cope with social aspects such as providing access especially for the less privileged — who often are travelling the longest distances — with congestion, with inadequate regulatory public transport frameworks, and with increasing air pollution which impacts health and quality of life.

The Lagos BRT system 'LAMATA' (Lagos Metropolitan Area Transport Authority) covers a 22km corridor. The corridor was selected using criteria including the gateway corridor spatial implications, traffic demand and the minimal disruption according to 'less resettlement action

plan'. During the planning phase a feasibility study was conducted and a design consultant was appointed. To ensure the involvement of the local stakeholders, study tours with union executives and a series of high-level meetings were arranged and a BRT implementation committee was inaugurated. Since several design and construction works have been outsourced a delivery strategy for the services has been applied. It comprised the following features (Box 6):

Box 7: Features of the LAMATA delivery strategy

Features of the LAMATA delivery strategy
Design and construction contracts to ensure quick delivery
The different design and construction works allowed to overlap so as to meet the tight time-scale of delivery
LAMATA specified within the requirements parameters which dictates the success of the project
Contractors were given a free hand to deliver a design that meets the requirements

The outsourced services were related to the bus depot, the BRT segregation barriers (three contracts), the building of terminals, bus shelters, stations, street lighting, traffic systems management, lane marking and signage (two contracts), BRT lane fencing, service-lane rehabilitation and consultancy supervision.

During the planning and implementation phases a range of challenges had to be coped with. The following table summarises the challenges as well as solutions.

Box 8: Challenges and solutions during the BRT-implementation phase

Challenges	Solutions
Users' perceptions and acceptability of BRT	Strong political support
Getting the existing operators' buy-in	Involvement of the informal sector in the planning of BRT
Land acquisition for PT infrastructure	The defining of a form of BRT that meets key user needs
Traffic management during construction	Public acceptance of the scheme through education, interaction and quality service experience
Users' perception and acceptability of BRT	Sensitisation of the public on the operation of BRT
	Involvement of traffic officers in the planning of the construction phase
	Leadership professionalism within LAMATA

A special focus was directed towards the re-organisation of the informal sector. This has been responded to by forming a cooperative that comprises stakeholders along the BRT corridor; by establishing a steering committee comprising LAMATA and the funding bank to provide professional advice on the management of the cooperative and BRT operation; and by developing a constitution for the cooperative which provides the guideline for operation.

Due to the growing transport demand the Lagos BRT will be expanded in future. Therefore, Lagos State has developed a Strategic Transport Master Plan (STMP) for 2020. It soon will be extended to 2030. It foresees the development of a modern multi-modal, integrated, safe, high-quality transport system comprising various modes of transport such as rail, bus, ferry and cable car.

Picture 9: 'BRT Lite' as implemented in Lagos **Picture 10: Possible future BRT implementation**



During the planning, implementation and operation phases of the BRT in Lagos, LAMATA has learnt several lessons, which can serve as examples for the Rea Vaya development. The careful and adequate preparation and planning is essential for any successful transport initiative. Funding plays a crucial role in the transport sector. For the acquisition of financial means as well as for any other BRT implementation aspects, political support and strong leadership is a must. Finally to sustain BRT for posterity there is a need for institutionalised personnel development.

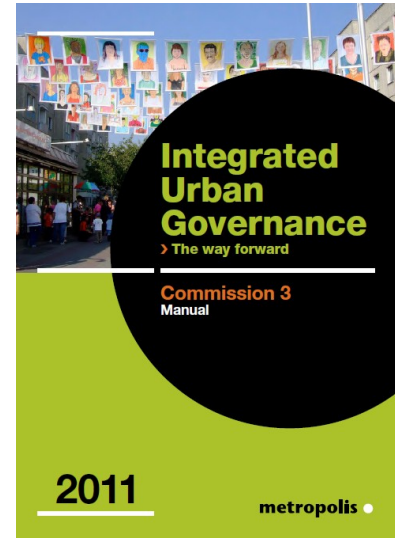
Mr Amiegbebor concluded his feedback presentation by recommending that Rea Vaya pay close attention to economic sustainability factors, of which ridership is the most important one. Rea Vaya could increase passenger numbers, for example, by highlighting the advantages of off-peak ticket use or long-term ticket use. Moreover, evaluation of the service performance is essential. Adequate performance indicators have to be designed and applied.

Prof. Hanns-Uve Schwedler as scientific advisor of the Berlin-led Metropolis Initiative 'Integrated Urban Governance', of which the Peer-Review-Training is one of the main activities, gave his feedback from the governance perspective.

He noted that when he heard about the severe problems occurred in Johannesburg with the taxi-bus industry and their resistance against the implementation of BRT, he felt reminded of the historical riot in ancient Rome when people reacted with riots on the increase of bread prices. This example demonstrates how important it is to take any occurring conflict under close consideration. Strikes, as happened in Johannesburg or conflicts with unions as happened in Lagos, are very critical especially in the initial phases of the BRT operation. Questions arise concerning if and how the current system can be changed and how similar conflicts can be avoided during the coming implementation phases. It is clear that the answer is that there is a strong need for participation. Participation provides the basis for the communication of the objectives and benefits of the system and delivers explanations why changes of the current system were undertaken. Prof. Schwedler drew attention to an issue that was mentioned several times in the presentations and discussions: the link to the land-use planning and particularly the land development of unused wasteland along the BRT line. For

this, cooperation between the different departments of the city is essential. Also, as mentioned before by Mr Amiegbebor, political will and leadership is decisive for the achievement of the desired goals. The handbook 'Integrated Urban Governance: The Way Forward' which was the main outcome of the previous Berlin Metropolis Commission 'Integrated Urban Governance' contains many best practices of the urban projects. The analyses of the reasons why they have been successful clearly showed that besides the required political leadership, also two other factors are important: The existence of a long-term strategy and overall vision, and the need for producing decision conjointly with the relevant stakeholders. He concluded with the statements: 'We have to give power away to get power back — and nothing works if political leadership is missing.'

**Picture 11: Handbook
'Integrated Urban Governance'**



The Results

During the Peer-Review-Training and the feedback presentations of the peers, vivid and fruitful discussions with the participating representatives of Rea Vaya took place. The results can be summarized as follows.

Overall, it was recognised the spatial configuration of Johannesburg has been strongly influenced by the previous Apartheid system. This is reflected in the sprawling urban settlement structure, with Soweto far to the south west, still divided from the rest of Johannesburg by mining and degraded empty land. Not only different **land uses** but also different constituent populations were located far apart. Moreover, the wastelands between settlement areas have remained either dedicated to the mining industry or left behind as tailings dumps. Many of the spaces are contaminated. All of this suggests that the Rea Vaya project could be about actively remaking the post-Apartheid landscape, and therefore much more than just a bus service. The Rea Vaya could be used in a way that responds to the manifold critical issues that affect Johannesburg.

Incremental changes towards a vision for a more compact sustainable city can be observed in the city, but more is needed. The input from the peers indicated that consideration should be given to all domains of the circles of sustainability — ecological, economic, political and cultural. Urban development should be directed to allow developers to build higher densities near the BRT corridor, and to attract public and private investment to realise them. Additionally, a development premium for the land along the corridor could be charged and used to subsidise future BRT/public transport operations. This is not just an economic question, but concerns all domains of social life.

The further expansion of the BRT bears a significant potential to have a high impact on the quality of life, on accessibility and the environment in Johannesburg. To maximise this positive development the appropriate approach for further planning should be to think big and bold. The entire network should be planned now with the physical realisation of the plan happening over time. The Rea Vaya should be planned in a network that links together the main corridors and transport-oriented development nodes. Only this way the system can be performed to its full possible potential. Additionally, by seeking for support for low-emission buses, including support from national government in respect of the appropriate regulatory framework, positive impacts for the environment can be maximised. Finally Rea Vaya can be a means to support the Johannesburg commitment to overcoming the Apartheid legacy. This is a declared goal of the city's policy. In the Executive Mayor's State of the Nation speech the Mayor of Johannesburg promised the residents five rights including "the right to a spatially integrated and united city"

The peers were very impressed with the high quality of the infrastructure of the Rea Vaya stations including the maintenance depot and the bus stops. However, they suggested certain changes to achieve greater **operational excellence**, particularly referring to infrastructure and patronage. Concerning the infrastructure, some problems with bus docking platforms were observed. To 'close the gap' between buses and bus dockings, different alternative technologies should be taken into consideration. Also, more training could contribute to building the confidence of the drivers. Another issue to rethink is how to balance the

advantages of bank-based travel card vs. other payment methods in relation to speed of transactions.

As patronage especially in off-peak hours is low, short-term measures such as creating turn-arounds and reducing route lengths in off peak hours; bringing people closer to the stations through appropriate infrastructure for cycling and walking; integration with the informal transportation sector; or giving incentives for people to travel off peak by providing more attractive tickets were recommended. A long-term measure could be to integrate land-use and transportation planning in the regulatory frameworks of the city.

Very good results to increase ridership can be achieved by improving the visibility of the system. The 'look and feel' of the BRT features should be combined with the rest of the city. The citizens should be informed on the city's efforts in transforming the city and public transport. A lot has been done and achieved already. Thus campaigns should go further to demonstrate the virtues of the Rea Vaya and create pride in the system.

A key element of improving the system's performance and thereby realising the vision of a caring city is to **actively involve the users** in all stages of the planning. It is important to hear their 'personal stories' and to learn from them.

Further recommendations were as listed in Box 8 below.

Box 9: Means to involve citizens in Rea Vaya development

Recommendations to involve citizens
Citizen participation in the transport master plan or city development plan
Campaigns about BRT Benefits: safety, time and money savings, emissions
Campaigns about construction details and traffic accommodation
Activities to encourage feedback (passenger charter, consumer parliament, etc.)
Usage of all mediums of communication: call centres, social media, suggestion boxes, etc.
Compiling profiles of frequent users

The **involvement of operators** is essential to successfully running the BRT. In the peer's cities the arrangement between municipal and private bodies are various. Taking into consideration the specific circumstances in Johannesburg, the city should connect with the informal sector and the mini-bus/taxi industry as a strategic partner by strengthening political engagement, support and trust-building. The handing over of power to them should however be treated carefully. They can cooperate only if they have the capacity and competency and are legally authorised to be operators. Being in charge of maintenance, bus ownership should rest with the operators.

Especially when taking into account that the BRT in Johannesburg will soon be expanded, **skills development** of all kinds of BRT employed personnel is highly important. New skills sets for existing occupations and new occupations in the public and private sector are required.

The Peer-Review-Training unveiled various recommendations related to training:

The investment in drivers' training especially regarding safety issues has to be increased, but training should also address informal operators to become competent operators. At the same time the system's performance should be constantly monitored, especially regarding contracting and management of the bus operations. Thus training should also comprise information technology skills.

During the discussions one issue that turned out to be a key factor was skills development: new career paths for all workers from drivers, security guards, customer care officers and monitors to bus supervisors, technical managers and managing directors should be opened. Personnel have to meet international and local standards and be given incentives to engage in learning and career-building in Rea Vaya.

Financial sustainability as one of the main features for service reliability and profitability is being handled in different ways in the peer's cities. They receive funding made up of national grants, local rates and taxes, fare revenue, advertising and project or development finances. For Johannesburg, options could be explored concerning how to cross-subsidise the Rea Vaya from private car-use and developments along public transport routes. This could include revenues from park-and-ride charging, a premium for development rights along the BRT corridor, a fuel levy, or project or development finance.

Integration of the BRT system can take place on several levels. On strategic level it can be achieved by planning new BRT lines only on routes with the appropriate demand. Distinct routes might better be suited for other modes of public transportation. However, all modes should be connected and integrated in one system. On operational level, integration can also be achieved by introducing new park-and-ride facilities to attract more private car-users for BRT, or by upgrading the surrounding public spaces in a way that it meets the requirements for pedestrians or cyclists. All these efforts in integrating other modes of transportation however require strong coordination and sound planning. Consequently, there is a strong need for a clear policy and authority to transform the transport system, whether it is BRT or other modes of public transportation.

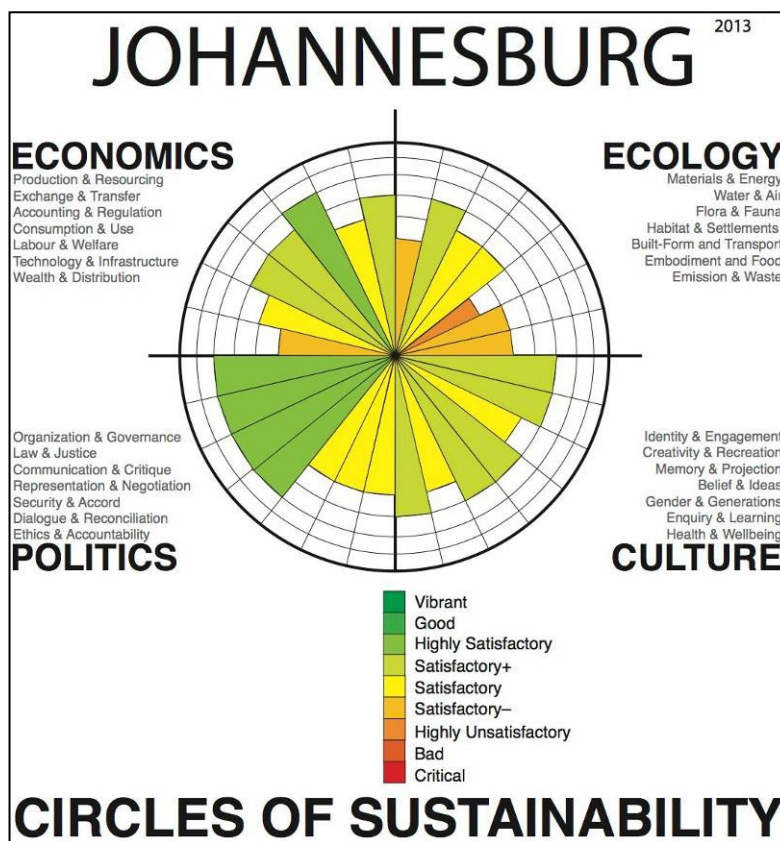
The Critical Issues

Prior to, and during, the Peer Review process, part of our effort in responding to the Rea Vaya project went into elucidating and examining critical issues that bear upon the success of the project. This was done using the Circles of Sustainability approach.

1. *Urban Profile Mapping*. Firstly, a profile map of the City of Johannesburg was developed prior to the forum using the Urban Profile Process, a tool developed by Metropolis with the United Nations Global Compact Cities Programme. This profile is based on a series of 196 questions regarding the city, organised around a four-domain model focussing on economics, ecology, politics and culture, with each of the domains divided into seven perspectives and each of the perspective divided into seven aspects. The questions were analysed by three urban experts in Johannesburg.

The Urban Profile Process is intended as a way of developing an interpretative description of the sustainability of an urban region and its immediate hinterland. Here *sustainability* is understood in relation to local, national, and global processes: ecological, economic, political and cultural. The Sustainability Profile questions are intended as way of developing a more comprehensive understanding of an urban region. By responding to the questions in the urban profile template, it is possible to generate a clear and simple graphic representation of the sustainability profile of that region. The map of Johannesburg is represented in the figure below. Keep in mind that the version presented here is an aggregated self-assessment version by local experts. Others might have judged it more critically or differently. Nevertheless, the Profile offers an instructive sense of strengths and weaknesses in the city. Importantly, this was done as a standalone exercise and the experts were not asked to relate the Profile to the Rea Vaya. This means that none of the responses were distorted by focussing on this project rather than another.

Figure 3. An Urban Profile Assessment of the Sustainability of Johannesburg



In summary, what the profile suggests is that there are 'critical issues' that are less than satisfactory in Johannesburg pertaining to the areas of 'built-form and transport', 'embodiment and food' (relating particularly to physical health in the city), 'emissions and waste', 'materials and energy', and 'wealth and distribution'. There is only space to give the broadest response and explanation of the detail here (and a lot of interpretive work lies beneath the surface of this figure). However, in short, what the analysis tells us is that the potential of the Rea Vaya project is its strategic position in relation to these critical issues.

More than a bus infrastructure project, the Rea Vaya needs to be considered in response to some fundamental ecological issues, and a basic economic issue of wealth distribution in the city supported by a skewed built-form. If the Rea Vaya can change the spatial separation between the poorer south-west and the wealthier north; if the Rea Vaya can contribute to reducing carbon emissions and particulate emission, and decrease dependency on heavy fossil fuel use by cars; if the Rea Vaya can be part of changing how people move around the city—then it could potentially make a substantial difference to improving the ecological and economic sustainability of the city. The heartening part of the analysis indicates that in the

political domain there is the will, capacity and potential community engagement to develop the Rea Vaya in a way that could make a substantial difference.

2. *Critical Issue Identification Process.* During the forum itself, critical issues directly relevant to the Rea Vaya were drawn out. The process took the following form:

- Before and throughout the discussion a list of 20 critical issues in relation to the *general issue* of developing a BRT were drawn out. (Identification of these critical issues is foundational to the whole process and drives the determination of the objectives of the project and also the selection of key reporting indicators. More could have been chosen but 20 issues gives enough complexity to show up some of the main tensions that need to be resolved. A 20-by-20 matrix gives nearly 200 relationships that could be analysed.)
- After the forum, a priority list of associated objectives was inferred in relation to the critical issues previously identified. (Having associated objectives is fundamental to guiding practice. The objectives should be achievable given the constraints and conditions of the broader context, and simply expressed.)
- After the forum, the relationship between different critical objectives was drawn up, highlighting any tensions between them. (Resolving tensions between critical objectives can begin, but this usually takes longer and more considered background research.)

Table 1: Critical Issues and Objectives Weighting: Twenty Priority Issues

Critical Issues	Critical Objectives	Orientation	Weighting to total 100%
Ecology			
1. Dispersal of urban settlement	To respond to and mitigate the urban sprawl of the metropolitan area.	-1	
2. Space for BRT corridors	To develop transport-oriented development around bus stations and interchanges.	0	
3. Pollution—carbon	To decrease greenhouse gas emissions.	-1	
Economics			
4. Financial costs—overall service	To bring down overall costs and achieve financial sustainability for the bus operating service.	-1	
5. Financial costs—maintenance	To decrease maintenance costs	-1	
6. Financial sustainability—land-use	To achieve returns from managing land-use around Rea Vaya corridors.	+1	
7. Patronage numbers	To increase patronage, particularly in low peak times and on return journeys.	+1	
8. Social inequity	To contribute to decreasing social inequity in the metropolitan area	-1	
9. Turnover of staff	To decrease the turnover of staff, such as drivers	-1	
10. Infrastructure—quality of provision	To maintain the current high quality of infrastructure for the next stages of the Rea Vaya.	0	
Politics			
11. Integrated planning	To increase the co-operation between the planning and other departments.	+1	





12. Conflict with local taxi-minibus drivers	To mitigate conflict and competition with local taxi-minibus drivers.	-1	
13. Negotiation with bus-operating companies over contracts	To ensure that the best contracts are negotiated with independent bus operators for delivery of good service.	0	
14. Negotiation with bus drivers	To decrease the number and intensity of strikes	-1	
15. Corruption	To decrease the potential for corruption in negotiation with providers, including over contracts and tendering.	-1	
Culture			
16. Training and capacity-development	To improve the skills of the service operators.	+1	
17. Taxi-minibus culture—drivers	To change the mentality of drivers so that they accept regularisation of routes, stops, times and processes.	0	
18. Taxi-minibus culture—passengers	To help passengers appreciate the nature of bus routes and schedules.	0	
19. Car-driving culture—road-use	To change the approach of drivers to BRT bus lanes.	0	
20. Cash-oriented culture	To shift the orientation of passengers towards a credit-based payment system.	0	

Defining the Tensions between Objectives

Assessing the compatibility of critical issues and resolving possible tensions between them is fundamental to the success of any project. This step in the process serves in particular to highlight patterns of strengths, consequence and tensions between different objectives. Such tensions always exist in some way, but often they go unrecognised. For example, economic growth, normally associated with increased use of non-renewable resources, is incompatible with environmental sustainability. While this seems obvious when made explicit it is often left unacknowledged. Explicitly recognizing the most salient of these tensions enhances the possibility that the city will be fully aware of countervailing forces and contradictory objectives, and thus policy-makers, practitioners, and engaged locals can find ways to negotiate between these tensions or mitigate possible problems.

Table 2: Objectives Compatibility Matrix

Critical Objectives	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1. Dispersal of urban settlement	o	+	+	+	+	o	o	o	o	+	+	o	o	o	o	o	o	o	o	o	o
2. Space for BRT corridors		o	o	+	o	+	o	+	o	+	+	o	o	o	o	o	o	o	o	o	o
3. Pollution—carbon			o	-	-	o	o	o	o	+	+	o	o	o	o	o	o	o	o	o	o
4. Costs—overall service				o	+	+	+	-	o	-	+	o	o	-	+	-	o	o	o	o	o
5. Costs—maintenance					o	o	o	o	o	-	+	o	o	-	o	o	o	o	o	o	o
6. Financial sustainability—land-use						o	o	+	o	+	+	o	o	o	o	o	o	o	o	o	o
7. Patronage numbers							o	o	o	+	+	-	+	o	o	o	o	+	o	o	o
8. Social inequity								o	o	+	+	+	o	o	+	+	+	+	o	o	+
9. Turnover of staff									o	+	+	o	o	+	o	+	o	o	o	o	o
10. Infrastructure—quality										o	+	+	+	o	o	o	o	o	o	+	o
11. Integrated planning											o	+	+	+	+	+	+	+	+	+	+
12. Conflict with minibus drivers												o	o	o	o	o	o	o	o	+	o
13. Negotiation with bus companies													o	o	+	o	o	o	o	o	o
14. Negotiation with bus drivers														o	o	+	o	o	o	o	o
15. Corruption															o	o	o	o	o	o	o
16. Training																o	+	o	o	o	o
17. Mini-bus culture—drivers																	o	+	+	o	o
18. Mini-bus culture—passengers																		o	o	+	o
19. Car-driving culture—road-use																			o	o	o
20. Cash-oriented culture																					o

	Not relevant (doubling up)
	Neutral o
	Compatible (positive) +
	In Tension -

The analysis of these critical-issue relationships could be extensive and worked through in detail. For example, we have not done a weighting of the importance of the issues for the Rea Vaya team, and with such a weighting we could analyse the priority strengths and tensions to work upon. However, here we have only the space to make some of the more stark points that are revealed by the mapping.

In positive terms, the three most important issues concerning the Rea Vaya are decreasing inequality, maintaining infrastructure quality and improving integrated planning. These are closely followed by the importance of responding to urban sprawl and planning for space around urban corridors for transport-oriented development. For follow-up work we recommend an analysis of these issues and their relationship. Given the self-assessed strengths in the political area including organisation and governance as shown in the Urban Profile Process figure building upon that strength with a bold vision to respond to those five objectives in a manifold way becomes paramount.

The most complicated issues are decreasing the cost of the overall service and decreasing carbon emissions. Again this requires considerable teasing out and further analysis.

There are nine points where objectives in obvious tension. For follow-up work we suggest developing an explicit analysis of these tensions. A model for the beginnings of such an analysis in relation to one of those tensions is set out in the table below.

Table 3: Objectives in Tensions

Objectives in Tension	Notes on the Causes, Impacts and Possible Reconciliation of the Tension in Question
<p>3. To decrease greenhouse gas emissions; and</p> <p>4. To bring down overall costs and achieve financial sustainability for the bus operating service.</p>	
<p>Etc.</p>	

The Appraisal

The Peer-Review-Training was a critical but open and constructive workshop in which various aspects of the planning, implementing and operating of BRT were mutually shared. The feedback made by the peers on the Johannesburg BRT was presented with vivid energy and has led to outcomes which are useful for the future development of Rea Vaya. Johannesburg is on the right track because BRT has and can have a big impact on accessibility, land-use planning and the economy.

The peers reported that the review helped to identify and acknowledge common challenges and that they have learned a lot from Rea Vaya. Sophisticated technical features, environmentally friendly processes, and up-to-date infrastructure, served as good examples for the BRT in their home cities. Moreover, they were strongly impressed by the speed of the Rea Vaya implementation and of the achievements in a difficult local context, where many different interests of the car lobby and resistance from informal sectors of transport have occurred. This could have happened only by having a passionate team such as in Johannesburg. The role of a motivated and cooperating and well-led team cannot be underestimated when realising such wide-scope urban programmes. Other opinions on the workshop were as listed in Box 9 below.

Box 10: Opinions on the Peer-Review-Training (statements from Peers shaded)

Opinions on the Peer-review-Training approach	Opinions regarding the lessons learnt
The PRT was good and the work was intense	High density along BRT lines should be supported
The three days were very interesting, particularly from international view. However, sometimes there was criticism without advice.	The discussion on high-floor vs. low-floor buses was very useful
Thanks to the city of Jo'burg	I was impressed by the quality you've done.
I will take a lot of experience at home.	I am highly impressed by Rea Vaya. All problems mentioned are common.
It was refreshing because it was not a lecture. Here people were really exchanging experiences — you can't pay for this. The platform itself is innovative and should be applied more often.	Many things are to be done to increase patronage.
It was a pleasant experience. Rea Vaya is an extraordinary name: congratulations. My intension was to save you time to avoid mistakes we have made already.	Input from Germany on governance was very good.
It was very good, because if you are so involved in the project you sometimes don't see any more what runs well what not. I enjoyed the session but it should have been longer.	Historical background has a strong impact here.
I would recommend to have another session after implementation of phase 1C It was encouraging to know that we're not much out.	Learnt how far we have to go in term of land use, vision, government.
Good peers. We will be taking forward the bilateral communications.	It was useful to learn from international best practice — but standards must be appropriate for local conditions and culture.

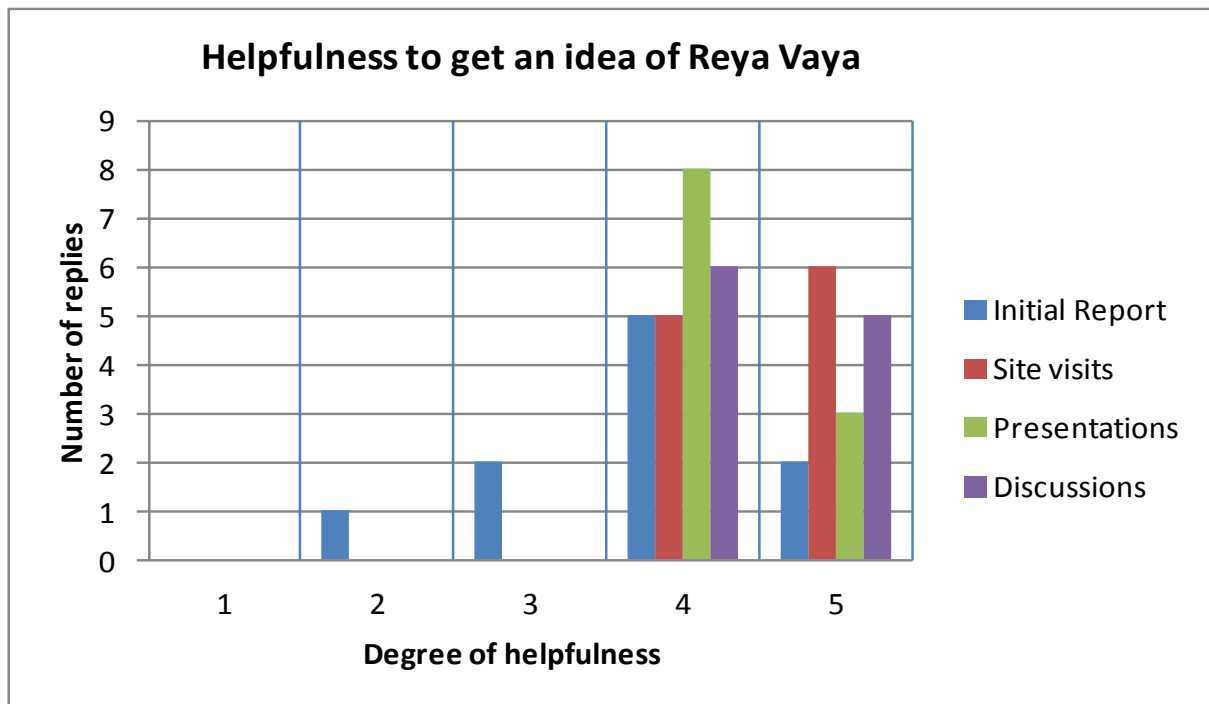
The **evaluation** of the workshop with a questionnaire confirmed the positive impression the peers had from the workshop. Replies to the question 'What could your city learn from the Johannesburg project (main aspect)?' were diverse. Various exemplary features of Rea Vaya were mentioned: 'consultative nature of the project', 'empowering disadvantaged sections of the society', 'station design', 'infrastructure development', 'quality of infrastructure, 'pace in which infrastructure was delivered'.

Another question addressing the peers asked: 'Which experience made in your city could be useful for Johannesburg project (main aspect)?'. Here the replies were also diverse: 'coordinating the BRTs project with Master Plan for the city. Not "reacting" to demand, but "creating demand" that supports BRTs.', 'operation, fare system, ITS'; 'standardisation', 'transport planning', 'high densities along BRT corridors, improvements on off-demand patronage, network effect of the system'.

The replies on the question whether it would be useful to exchange more experience beyond this workshop, were unequivocal: All participant checked the box 'yes'. The linked question asked: 'In which field do you think further exchange/cooperation would be beneficial for both cities/institutions?' Three replies were suggesting to have future study tours to exchange experience on BRTs, two participants suggested to organise the training of BRT staff in another city that operates BRT or to deepen the exchange in an 'academy for training in various fields' and to 'feel and look' on site. Others suggested addressing sectoral fields around land-use or spatial planning such as development mechanisms, compact cities or density corridors. Still others suggested addressing BRT operation, technology and ITS, financial model and legislation.

In order to improve the design of future Peer-Review-Training forums it is important additionally to assessed which parts of the workshop have contributed most to getting a thorough understanding of the Rea Vaya BRT. Good results were achieved by the site visits, the discussions and the presentations. Also, the *Initial Report* was valued by five participants with 'four' on a scale from one to five, where one means 'has contributed a little' and five means 'has contributed very much'. Thus, it can be concluded that all parts of the workshop together gave a comprehensive picture of Rea Vaya.

Figure 4: Helpfulness of single parts of the PRT to get an idea of Rea Vaya



The assessment of the questionnaire and individual discussions clearly demonstrates that the method of Peer-Review-Training is very helpful for exchanging practical knowledge between the participating cities.

This perception was also shared by the participants in the 'Feedback Session on the Metropolis Peer-Review-Training' which was held on 18 July 2013 and which was open to all participants of the Metropolis Annual Meeting. After Ms Seftel had presented the results of the Peer-Review-Training and after a energetic open discussion with the peers and the audience, the Mayors of Johannesburg and Berlin agreed in their statements that the peer review

meeting brought many new and helpful insights for both, the hosts and the peers — and that it is ‘a good and very well-designed method to organise and intensify exchange of experience between cities’.

Credits

Figure 1: Method of Peer-Review-Training	Michael Abraham
Figure 2: Features of BOCA: 1A and 1B (1)	Source: Power Point Presentation 'The Bus Rapid Transit System of Johannesburg: State and Challenges', Ms Lisa Seftel, Executive Director Transport Department, City of Johannesburg
Figure 3: An Urban Profile Assessment of the Sustainability of Johannesburg	Prof. Paul James, Director of UN Global Compact Cities Programme
Table 1: Critical Issues and Objectives Weighting: Twenty Priority Issues	
Table 2: Objectives Compatibility Matrix	
Table 3: Objectives in Tensions	
Figure 4: Helpfulness of single parts of the PRT to get an idea of Rea Vaya	Michael Abraham
Box 1: Key Questions of the Peer -Review-Training	Source: own diagram based on information in "Peer-Review-Training Johannesburg July 2013, The Bus Rapid Transit System of Johannesburg, State and Challenges, Initial Report"
Box 2: Future implementation phases of Rea Vaya	Source: own diagram based on Power Point Presentation 'The Bus Rapid Transit System of Johannesburg: State and Challenges', Ms Lisa Seftel, Executive Director Transport Department, City of Johannesburg
Box 3: Guiding principles and their application	
Box 4: Levels of integration and objectives	
Box 5: Additional feedback from Mr. Calderón	source: own diagram based on hand written notes of Mr Guillermo Calderón Aguilera, General Director, Metrobús, Mexico City
Box 6: Impressions after site visits and presentation	source: own diagram based on Power Point Presentation 'Peer Review Training, Metropolis 2013, July 16, Joburg BRTS', Abhijit Lokre, CEPT University, Ahmedabad
Box 7: Features of the LAMATA delivery strategy	source: own diagram based on Power Point Presentation 'Implementing BRT to Improve People Mobility – A Presentation at the BRT Peer Review Meeting, Johannesburg 2013 By Dr. Dayo Moberola MD/CEO LAMATA'
Box 8: Challenges and solutions during the BRT-implementation phase	
Box 9: Means to involve citizens in Rea Vaya development	Michael Abraham
Box 10: Opinions on the Peer-Review-Training (statements from Peers shaded)	
Pictures cover page 1, 2, 3, 4, 5, 6	Michael Abraham
Picture 7	source: Power Point Presentation: Peer-Review-Training Johannesburg – The Bus Rapid Transit System of Johannesburg, State and Challenges', Mr Guillermo Calderón Aguilera, General Director, Metrobús, Mexico City
Picture 8	İstanbul Elektrik Tramvay ve Tünel (İETT)
Pictures 9, 10	source: Power Point Presentation 'Implementing BRT to Improve People Mobility – A Presentation at the BRT Peer Review Meeting, Johannesburg 2013 By Dr. Dayo Moberola MD/CEO LAMATA'
Picture 11	Cover page of Metropolis Commission 3 Manual 'Integrated Urban Governance – the way forward'.

Authors:

Michael Abraham, Metropolis Initiative Berlin
Prof. Paul James, Director of UN Global Compact Cities Programme

Annex:

- Evaluation of questionnaires
- Programme of PRT and Feedback Session
- Participants list
- Initial Report

Presentations

In order to keep this document lean and manageable, the presentations which were held during the Peer-Review-Training are not included in this report. They can be downloaded on this website:

<http://www.metropolis.org/initiatives/integrated-governance> click '+Info'

Alternatively they can be requested by contacting:

BARBARA BERNINGER, Regional Secretary Europe Metropolis, Head of Division for EU and International Affairs, Senate Department for Urban Development and the Environment Berlin

Barbara.Berninger@SenStadtUm.Berlin.de

Evaluation of questionnaires

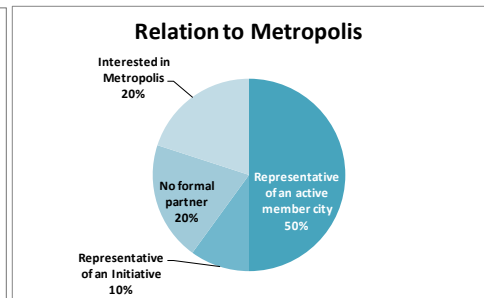
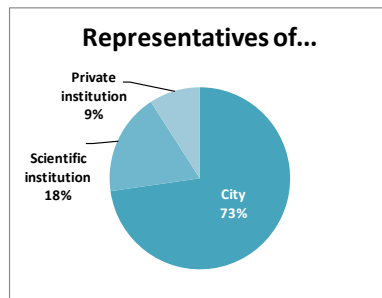
Metropolis Peer-Review-Training Johannesburg, 15–16 July 2013 The Rea Vaya Bus Rapid Transit System Evaluation of the questionnaire

The questionnaire is divided in three parts. Personal information on the participants, their opinion the workshop and on its outcomes were quantitatively and qualitatively assessed. In total 11 of the 16 participants of the second day of the workshop completed the questionnaire. The results are listed below according to the questions asked.

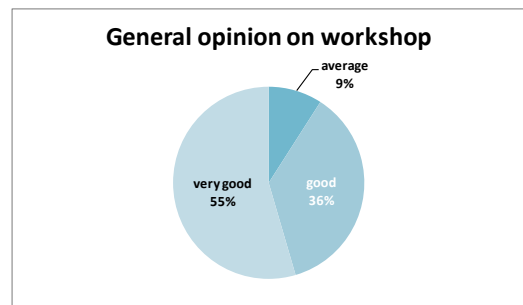
The first two questions asked if participants are **representative of a city, of a scientific, private or other institution and what is their relation to Metropolis.**

Almost three-quarters were representatives of cities.

Other participants were from scientific or private institutions. Half of the participants were representatives of an active Metropolis member city and 20% indicated that they had no formal membership or interest in Metropolis. 10% were representatives of a Metropolis Initiative.

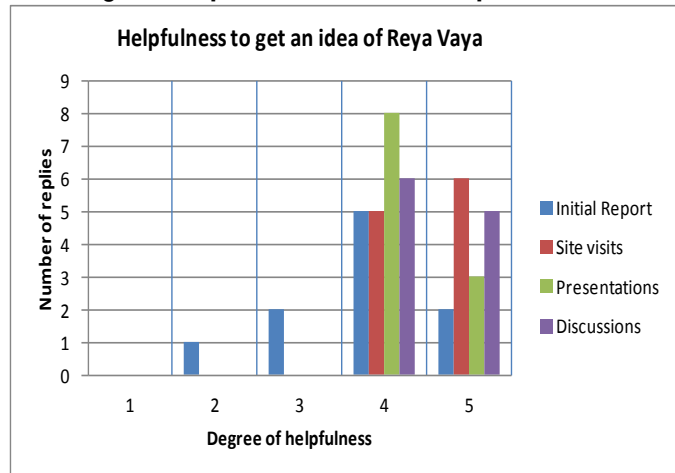


The following questions addressed the quality of the workshop. The question **'What is your opinion on the workshop?'** was answered by more than half of the participants by indicating that the workshop was 'very good'. Others thought it was 'good' and one participant had the opinion it was 'average'. The replies on the **question concerning the preparation of the workshop (briefing information on method, tasks, travel, etc.)** were identical to the previous question. Besides one participant, all indicated that it was either 'very good' or 'good'.



The replies to the **question concerning the facilities, such as room, technical equipment, interpretation, etc.,** were very positive: 64% thought they were 'very good' and 36% stated they were 'good'. Also the replies on the question concerning the **moderation of the workshop** were very good. Eight out of eleven participants thought it was 'very good', and the other three thought it was 'good'.

The next set of questions sought to assess to what degree the **parts of the workshop contributed to getting an idea of the Rea Vaya BRT**. Good results were achieved by the site visits, the discussions and the presentations. Also, the 'Initial Report' has been valued by five participants with 'four' on a scale from one to five, where one means 'has contributed a little' and five means 'has contributed very much' to which degree this part of the workshop has helped to understand the programme. Thus, all parts of the workshop together gave a comprehensive picture of the Jo'burg BRT.



Additionally, it was asked: **'Which of these elements should receive more attention and time in future Peer-Review-Trainings'**.

The replies are confirming the similar helpfulness of the single modules of the workshop: discussions, site visits and presentations were mentioned. Two participants thought it would be helpful to share the presentations prior to the workshop. One participant indicated that the 'peer review training should be more than two days'.

Replies to the question **'What could your city learn from the Johannesburg project (main aspect)?'** were diverse. Various exemplary features of Rea Vaya were mentioned: 'Consultative nature of the project / Empowering disadvantaged sections of the society', 'Station Design', 'Infrastructure development', 'Quality of infrastructure / Pace in which infrastructure was delivered'.

Another question addressing the peers asked: **'Which experience made in your city could be useful for Johannesburg project (main aspect)?'**. Also here the replies were diverse: 'Coordinating the BRTs project with Master Plan for the city. Not "reacting" to demand, but "creating demand" that supports BRTs. ', 'Operation / Fare System / ITS'; 'Standardisation', 'Transport Planning', 'High densities along BRT corridors / Improvements on off demand patronage / network effect of the system. '.

The replies on the question whether it would be **useful to exchange more experience beyond this workshop**, were unequivocal: All participant checked the box 'yes'. The following question sought to add specificity to this indication by asking **'In which field do you think further exchange/cooperation would be beneficial for both cities/institutions?'** Three replies suggested having future study tours to exchange experience on BRTs, two participants suggested organising training of BRT staff in another city that operates BRT or deepening the exchange in an 'academy for training in various fields' and to 'feel and look' on site. Others addressed sectoral fields around land-use or spatial planning such as development mechanisms, compact cities or density corridors. Others addressed BRT operation, technology and ITS, financial model and legislation.

The last question asked about the **willingness of the participants to discuss a programme/project in a future Peer-Review-Training and which** this could be. Nine of eleven participants indicated that they would be interested in having a PRT in their city. Suggestions for topics/projects/programmes were mainly addressing three fields: **mobility**, including public transport, and transportation; **land-use planning**, including land development mechanisms, spatial planning, and infrastructure; and **training**, including human-resource training in BRT environment. Also mentioned were financial models, the informal operators transformation and a possible future review of the BRT project.

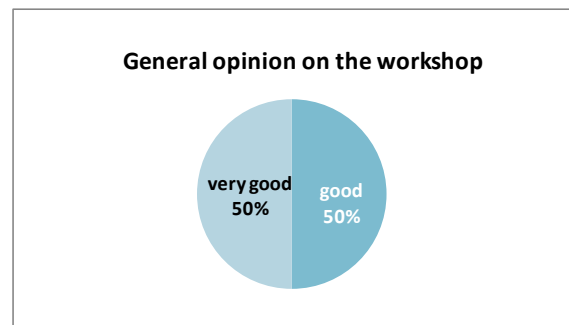
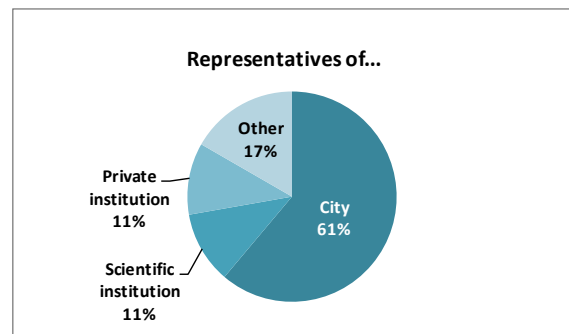
Michael Abraham, Berlin 30th July 2013

Metropolis Peer-Review-Training Johannesburg, Feedback Session 18 July 2013 The Rea Vaya Bus Rapid Transit System Evaluation of the questionnaire

The questionnaire is divided in three parts. Personal information on the participants, their opinion on the workshop and on the Peer-Review-Training approach were quantitatively and qualitatively assessed. In total 18 from over 50 participants of the workshop completed the questionnaire. The results are listed below according to the questions asked.

The first question asked if participants are **representative of a city, of a scientific, private or other institution**. Most of the participants were representatives of cities. Less than half of the participants were from scientific, private or other institutions.

A number of questions addressed the quality of the workshop. The question **'What is your opinion on the workshop?'** was answered to equal parts by indicating that the workshop was either 'very good' or 'good'. None of the participants perceived the session as 'average' or 'poor'. The replies to the **question concerning the facilities, such as room, technical equipment, interpretation, etc.** were very positive: 71% thought they were very good and 29% stated they were good. Also the replies to the question concerning the **moderation of the workshop** were very good. 13 out of 18 participants thought it was 'very good', whereas all others thought it was 'good'. The last question in this section addressed the **speakers**. Here the same results were reported: 13 participants perceived them as 'very good'; the others as 'good'.



The next set of questions asked **if the Peer-Review approach could contribute to the participant's work**, which was replied at 100% positively, and **which project or topic they would suggest for a possible future peer-review**. Diverse topics and projects were mentioned:

- Transport for inner city only in order to fight congestion, pollution.
- Facilitating more investment opportunities for poor municipalities
- Economical compliance and enforcement
- Focus on governance mechanisms, i.e., structures, delegated authority and committees responsible for oversight and reporting
- Greenhouse gas emissions reduction on the BRT systems especially focusing on Rea Vaya
- Property valuations shared services / Training institute for municipalities
- Peer Review on the dredging of small rivers..., provision of boreholes around the city and in the neighbourhoods / Sustainable energy like solar energy

The final question: **'What could be enhanced? Any other comments?'** was only answered by three participants. They mentioned to include the costs of the peer-reviews in the presentation, to include more speakers and: 'Nothing — working well'

Michael Abraham, Berlin 30th July 2013

Metropolis Peer-Review-Training Johannesburg, 15. – 16. July 2013

The Rea Vaya Bus Rapid Transit System

Final Programme

Venue

The Hilton Hotel, 138 Rivonia Rd, Johannesburg Sandton 2146
Room: Kwena (from ground floor go up to reception level)

July 14th

19:00h Informal Welcome Dinner @ The Maslow Hotel (by invitation only)
Corner Grayston Drive & Rivonia Road, Sandton

July 15th

Facilitator: Paul James, Director of UN Global Compact Cities Programme

8:30h **Registration** at the Hilton Hotel
(Please note registration will be open from Sunday 14th July, 12:30h – 17:00h)

8:45h **Welcome address**

- Ms Lisa Seftel, Executive Director, Transport Department, City of Johannesburg
- Barbara Berninger, Regional Secretary Europe Metropolis, Head of Division for EU and International Affairs, Senate Department for Urban Development and the Environment Berlin

9:00h **Departure** from Hilton Hotel to Johannesburg Roads Agency (JRA)
Head Office (city arranged vehicle will transport delegates)

9:30h **Technical visits to:**

- Control room (Presentation and viewing at JRA)
- Walk to Rea Vaya station to take a trip on Phase 1A (operational)
- City arranged vehicle will transport delegates from Thokoza Park to Medowlands Depot
- Tour of the state of the art depot (Presentation by General Manager of Piotrans: Bus Operating Company)
- Return on route of next phase (to be operational by October 2013) with city arranged vehicle

13:00h **Lunch** at Hilton Hotel

14:00h **Introduction of goals and expectations of Peer-Review-Training**
Paul James, Director of UN Global Compact Cities Programme

14:10h **Introduction of peers:** expertise, projects, expectations etc. (each peer max. 5 min)

- 14:20h **Presentation of Rea Vaya Bus Rapid Transit System**
Lisa Seftel, Executive Director Transport Department, City of Johannesburg
- 14:50h **Coffee Break**
- 15:20h **Presentation of Rea Vaya Bus Rapid Transit System – continued**
Lisa Seftel, Executive Director Transport Department, City of Johannesburg
- 15:50h **Plenary discussion:**
- First impressions on Rea Vaya BRT
 - Deepening of questions on the implementations of Rea Vaya BRT as formulated in the initial report
- 16:30h **Individual preparation of feedback on questions on Rea Vaya BRT by Peers**
- 17:30h **End of Day One**

July 16th

Facilitator: Paul James, Director of UN Global Compact Cities Programme

- 9:30h **Introduction of goals of second day**
Paul James, Director of UN Global Compact Cities Programme
- 9:45h **Presentations of feedback on questions on the implementation of Rea Vaya BRT (40 min each peer)**
- 10:45h **Coffee break**
- 11:15h **Presentations of feedback on questions on the implementation of Rea Vaya BRT – continued**
- 12:15h **Lunch**
- 13:15h **Feedback on participatory and integrative aspects of Rea Vaya BRT**
Prof. Hanns-Uve Schwedler, European Academy of the Urban Environment, Berlin
- 13:30h **Discussion:**
- Reactions of Rea Vaya project leaders on feedback from peers
 - ‘Which comments are useful for improving Rea Vaya BRT?’
- 15:00h **Coffee break**
- 15:30h **Concluding discussion:**
- ‘What could the **peers** learn from Rea Vaya BRT?’
- 16:15h **End of day two**

The Peers

- Dr. Desmond Amiegbebhor Edenojie,
Deputy Director of Bus Services
Lagos Metropolitan Area Transport Authority (LAMATA)
- Guillermo Calderón Aguilera
General Director
Metrobús, **Mexico City**
- Prof. Abhijit Lokre,
Associate Professor at Faculty of Planning and Public Policy at CEPT
University, **Ahmedabad** and certified trainer in 'Mass Rapid Transit
Systems' by GIZ, Germany

Additional Input

- Hanns-Uve Schwedler,
European Academy of the Urban Environment,
Berlin

Other Information

For information about the hotel and how to get there, please visit the following website:

<http://www3.hilton.com/en/hotels/south-africa/hilton-sandton-JNBSATW/index.html>

Locations



- The Maslow Hotel,
146 Rivonia Rd,
Johannesburg Sandton 2146
- Hilton Hotel,
138 Rivonia Rd,
Johannesburg Sandton 2196
- Courtyard Hotel Sandton,
130 Rivonia Rd
Johannesburg Sandton 2128

Johannesburg 2013 Metropolis Annual Meeting “Caring Cities”**Feedback Session on Peer-Review-Training on Johannesburg Bus Rapid Transit System - Programme**Date: Thursday 18th of July

Time: 11:00 – 12:40

Venue: The Hilton Hotel, 138 Rivonia Rd, Johannesburg Sandton 2146, Ballroom 3

Summary

During the 2013 Metropolis Annual Meeting Johannesburg in cooperation with the Berlin Metropolis Initiative ‘Integrated Urban Governance – Successful Policy Transfer’ will carry out a Peer-Review-Training (PRT) dedicated to the Johannesburg Bus Rapid Transit system. This closed workshop will take place from Monday 15th of July to Tuesday 16th of July.

In this PRT challenges and achievements of the Bus Rapid Transit (BRT) system of Johannesburg will be presented by the local project leaders and discussed with colleagues from up to five other cities worldwide who adopt the role of critical friends – the peers. By pursuing this practical peer to peer approach the Johannesburg BRT system will be reviewed, ways how to increase the efficiency of the system will be elaborated and the successes achieved so far will be demonstrated to the practitioners of the invited participating cities. This way, practical knowledge will be transferred between the cities and mutual learning will be made possible – by doing this the cities will act as ‘caring cities’.

This feedback session intends to introduce the methodology of the PRT and seeks to discuss the results of the Peer-Review-Training with a wider public: local, national and international public transportation planners, politicians and other decision makers as well as NGOs and transnational organisations. The goal is to share the outcomes of the PRT with additional cities and organisations and to discuss the feedback given by the participants of this session. Thus it will also be made possible to obtain additional feedback to further improve the Johannesburg BRT system.

Format and programme of session

- Open session co-chaired by Berlin and Johannesburg
- Moderation: Paul James, Director of UN Global Compact Cities Programme

	Subject	Name
11:00	Welcome address	Christine Walters , Member of the Mayoral Committee MMC for Transport, City of Johannesburg Barbara Berninger , Regional Secretary Europe Metropolis, Head of Division for EU and International Affairs, Senate Department for Urban Development and the Environment Berlin
11:10	Presentation of the methodology	Hanns-Uve Schwedler , European Academy of the Urban Environment, Berlin
11:25	Presentation of main results of the PRT	Lisa Seftel , Executive Director Transport Department, City of Johannesburg
12:00	Open feedback discussion <ul style="list-style-type: none"> • Questions from audience to peers and hosts • Additional feedback 	Moderator Peers Representative of Johannesburg BRT Audience
12:30	Closing remarks	Parks Tau , Mayor City of Johannesburg Michael Müller , Mayor of Berlin
12:40	End of session	

Metropolis Peer-Review-Training, Johannesburg, 15. – 16. July 2013

The Rea Vaya Bus Rapid Transit System - PARTICIPANTS

#	Participant	Participation in first day only
1	Dr. Desmond Amiegbebhor Edenojie , Deputy Director of Bus Services, Lagos Metropolitan Area Transport Authority (LAMATA)	
2	Mr Guillermo Calderón Aguilera , General Director, Metrobús, Mexico City	
3	Prof. Abhijit Lokre , Associate Professor at Faculty of Planning and Public Policy at CEPT University, Ahmedabad and certified trainer in 'Mass Rapid Transit Systems' by GIZ, Germany	
4	Ms Christine Walters , Member of the Mayoral Committee MMC for Transport, City of Johannesburg	
5	Ms Lisa Seftel , Executive Director Transport Department, City of Johannesburg	
6	Mr Charles Blok , Director: Infrastructure, City of Johannesburg	
7	Mr Eric Motshwane , Director: Operations Piotrans, Bus Operating Company, City of Johannesburg	
8	Mr MK Mohlala , Executive Chair, Piotrans Bus Operating Company	
9	Ms Voyiswa Voyi , Johannesburg Development Agency, City of Johannesburg	
10	Mr Jeff Ngcobo , Director: Operations, City of Johannesburg	
11	Mr Benny Makgoga , Director: Service Promotions, City of Johannesburg	x
12	Mr Brendan Petersen , Director: Finance and Administration, City of Johannesburg	
13	Mr Ibrahim Seedat , Director: Public Transport, National Department of Transport	
14	Ms Yolisa Mashilwane , ED Transport, Ekurhuleni	
15	Ms Lungi Madlala , ED Transport, Tshwane	x
16	Mr Nelson Rikhotso , Ekurhuleni	x
17	Mrs Zarina Goondiwala , Knowledge Manager, City of Johannesburg	
18	Ms Tebogo Mogashoa , Stakeholder Liaison, Office of MMC, Transport, City of Johannesburg	
19	Mr Javier Cajiao , Chief Operating Officer, Piotrans, Bus Operating Company, City of Johannesburg	x
20	Prof. Paul James , Director of UN Global Compact Cities Programme	
21	Ms Barbara Berninger , Regional Secretary Europe Metropolis, Head of Division for EU and International Affairs, Senate Department for Urban Development and the Environment Berlin (Welcome address)	
22	Prof. Hanns-Uve Schwedler , European Academy of the Urban Environment, Berlin	
23	Mr Michael Abraham , Project Officer, Metropolis Berlin	
24	Ms Christine Piquemal Viñas Initiatives Coordinator World Association of the Major Metropolises	x
25	Mr Hamid Isfahanizadeh , Director of International Scientific Cooperation Office & Metropolis Training Center, Mashhad	x
26	Mr Eugene Zapata Garesché , Senior International Advisor to the Mayor of Mexico City	x
27	Ms Mary Lewin Metropolis Regional Secretariat Asia-Pacific, Manager International Affairs, Department of Planning and Community Development, Melbourne	x



a world class African city



**Peer-Review-Training Johannesburg July 2013
The Bus Rapid Transit System of Johannesburg,
State and Challenges**

Initial Report

City of Johannesburg, Rea Vaya BRT South Africa

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Introduction

The Rea Vaya Bus Rapid Transport (BRT) system is a fully integrated bus rapid transit system that marks the implementation of integrated public transport systems in the City of Johannesburg in South Africa.

The system is changing the shape of the transport and landscape in the City. Implementing of the BRT has been a multi-faceted and complex project that has taken several years of dedication, commitment and effort, providing both great rewards and challenges for the City and its citizens.

The Rea Vaya Bus Rapid Transit (BRT) is planned not only to be a fast, safe, reliable and affordable modes of transport but to be a catalyst for public transport in the City of Johannesburg and contribute to many of the goals to make Johannesburg a world class African City. The long term vision is to develop a system that places over 85% of Johannesburg's population within 500m of a Rea Vaya transport route.

It was only in 2006 that the Johannesburg City Council agreed to introduce the Bus Rapid Transit (BRT) system. Construction started in 2007 and in August 2009 the first dedicated trunk route was operationalised. This year a second phase will begin and planning has started on a third phase.

This Initial Report looks at the challenges which led to the City introducing Rea Vaya BRT, how Rea Vaya BRT came about, its performance and impact to date and the current issues and challenges to guide discussion in the peer review training.

City background and challenges

The City of Johannesburg has a population of 4.4 million people, occupying a land mass of 1 645 square km. The population growth rate is 3.4% and the population density is approximately 2695/km². The number of households is 1 434 856 and the household size is 3 persons per households on average.

Surrounding Johannesburg are two other metropolitan areas or cities, namely Pretoria or Tshwane to the north and Ekurhuleni to the east and they together with a few smaller municipalities make up the province of Gauteng with a population of 11.2 million.

Gauteng is regarded as the economic hub of South Africa, making up 33% of the GDP of South Africa and 10% of the GDP of Africa. The City of Joburg contributes 49% of the Gauteng GDP. The GVA is at current prices R429 billion rand and the GVA per capita is R98 706.

In the wake of the global recession, the growth rate declined to 3.3% in 2011 but is forecast to grow to 4.8% by 2015.¹ Unemployment is very high, officially regarded as 23% of economically active people in 2010 but if those who have stopped looking for work are included, the number grows to over 30%. Coupled with high unemployment are high levels of inequality which are being described by the Gini coefficient (maximum inequality = 1).

¹ P 12, City of Johannesburg, Joburg Inc, 2012

The Gini coefficient in 2009 in Johannesburg was 0.63², contributing to making South Africa having the highest Gini co-efficient in the world.

The City is a product of its apartheid past and spatial restructuring post 1994 has been limited. Thus the majority of poor people stay in dormitory townships while richer people stay in private car orientated suburbs. There are two CBDS – the initial CBD, renamed “inner city” and the financial centre of the City and the country, Sandton.

Public transportation and modal share in Johannesburg

The perpetuation of apartheid’s spatial form means that the majority of people live far from where they work. The average travel time for commuters in Joburg, by public or private transport is 50 minutes one way. For the poorest of the poor in informal settlements on the periphery, travel times are even longer.

The 2002 Household Travel Survey showed that of the over 3.5. million daily trips in Joburg, 47% were public transport trips. Of these, 72% were minibus, 14% were rail and 9% were bus. We are currently doing a further survey but it is unlikely that the trip patterns will have changed significantly. The remaining 43% are mostly private car trips with only walking trips and cycling trips being a very small percentage.

Like many developing cities, there are high levels of congestion and a poor and inefficient public transport system, forces members of the growing upwardly mobile professional and middle classes to purchase a private car as soon as they can afford to do.

One of the increasingly critical problems created by high vehicle usage and impounded by congestion is the high levels of air pollution and greenhouse gas emissions. A State of the Energy Report in 2008 shows that transport is responsible for 31% of carbon emissions in Joburg thus making the City vulnerable and contributing to our international vulnerability to climate change.

There has been systematic underinvestment in transport in the City of Joburg both by the City itself and by other spheres of government who either have constitutional responsibility for certain functions such as rail or the national road network or benefit from the road or public transport network bearing in mind the central role that Joburg plays in the economy of South Africa.

Recently, as part of the 2010 World Cup preparations, the freeway system in Gauteng was upgraded at a cost of R30 billion with the hope that the funds would be recouped through an e-tolling scheme. Public opposition coupled with indecisive political leadership has seen the scheme postponed and should be reintroduced later this year with a reduced toll amount and thus a central government subsidy.

In respect of commuter public transport, the following modes are present in Joburg:

² P 13, ibid

Mode	Description
Mini bus taxi	There are about 30 000 commuter mini bus taxis in Johannesburg carrying approximately 15 passengers each. The mini bus taxi industry is dominated by private operators organised in informal associations on an area basis. The fleets are generally old and unsafe – thus minibus taxis are generally regarded as an accessible and convenient mode but not necessarily affordable or safe.
Metro bus	This City owned bus fleet which carries about 80 000 passengers per day with 450 fleet which is very old. The Mayoral Committee has recently taken a decision to refleet Metrobus and reorganise it along the lines of BRT although the buses will not be traveling in dedicated lanes.
Rail (metrorail)	In Gauteng as a whole, there are 1.3 million rail passenger trips per day. This has decreased by 25% since 2009 due to insufficient train capacity and poor service delivery but has increased 10% over the last year. Only between 76 and 85% of trains are on time and about 31% of coaches (available train fleet of 2296) are out of service at any one time. ³
Gautrain	Gautrain is a new 90km high speed rail linking the international OR Tambo International Airport to the new and old CBDs of Joburg and the administrative capital of South Africa. It is aimed at high income users who otherwise would use their private cars. It has been well received and is running at capacity in the peak. During February 2013, just over 550 000 passengers used the Gautrain.
Rea Vaya	Rea Vaya will be discussed elsewhere in the document but presently about 43 000 passengers use the service daily on 143 buses on one route from Soweto to the Joburg CBD.

Introduction of Rea Vaya BRT

4.1. Objectives of the Rea Vaya BRT

The City of Joburg has a 2030 Vision and Growth and Development Strategy. In respect of transport, the vision is “A safe and efficient transportation system, with a public transport focus, that will support a world class city, connecting businesses, people and places in a sustainable and cost effective manner and through this, improve the standard of living and quality of life of all the city’s inhabitants and the overall competitiveness and growth of the city’s economy”.

The Rea Vaya BRT is a key catalytic programme to achieve the above. Its objectives have been identified by the City leadership as to:

³ 2037 Consortium, ibid

- Provide safe reliable and affordable public transport and become a catalyst for integrated public transport as the mode of choice together with walking and cycling;
- Enable spatial restructuring including addressing the legacy of apartheid which resulted in a racially divided and fragmented City and contributing to a more compact city organised along transit orientated corridors and nodes.
- Achieve broad based black economic empowerment and job creation through high levels of labour intensive construction and incorporating incumbent operators that have operated the BRT proposed routes over many years as partners in a long-term, sustainable system that provides them with prosperity and sustainability;
- Contribute to building social cohesion and reducing social inequality; and
- Reducing air pollution and carbon emissions through the removal of existing fleet, reducing private car use and introducing low carbon emission vehicles.

At the inception of the Rea Vaya BRT, there was an additional objective to meet the obligations of Joburg as the host city for the 2010 FIFA Soccer World Cup as the FIFA contracts required to provide clean, safe and working transport during the 23 matches played in Johannesburg. This was achieved.

Linked to these objectives, the City envisaged a number of short and long term benefits to the City and its citizens which influenced how the BRT was planned and implemented. The short term benefits included:

- Efficient, reliable and frequent public transport services
- Affordable fares
- A safe and secure public transport system
- Accessible public transport for people with disability, mothers with children, elderly etc.
- A decrease in traffic congestion, energy consumption and vehicle emissions;
- An enhanced urban environment;
- Job creation and income generating opportunities

The following mediums to long term benefits were envisaged:

- Containment of urban sprawl and increased densification and transit orientated development;
- Promoting social inclusion and a greater sense of equality as residents of all races and classes used a single standard public transport system; and
- Economic development in and around the areas of operation of BRT.

4.2. Roll out of Rea Vaya BRT routes

The Rea Vaya has been rolled out in three phases. The first phase (Phase 1A) began operations in 2009 along 25.5 km from Soweto in the West to the inner city of Joburg with 30 stations and 146 buses of which 41 are articulated.

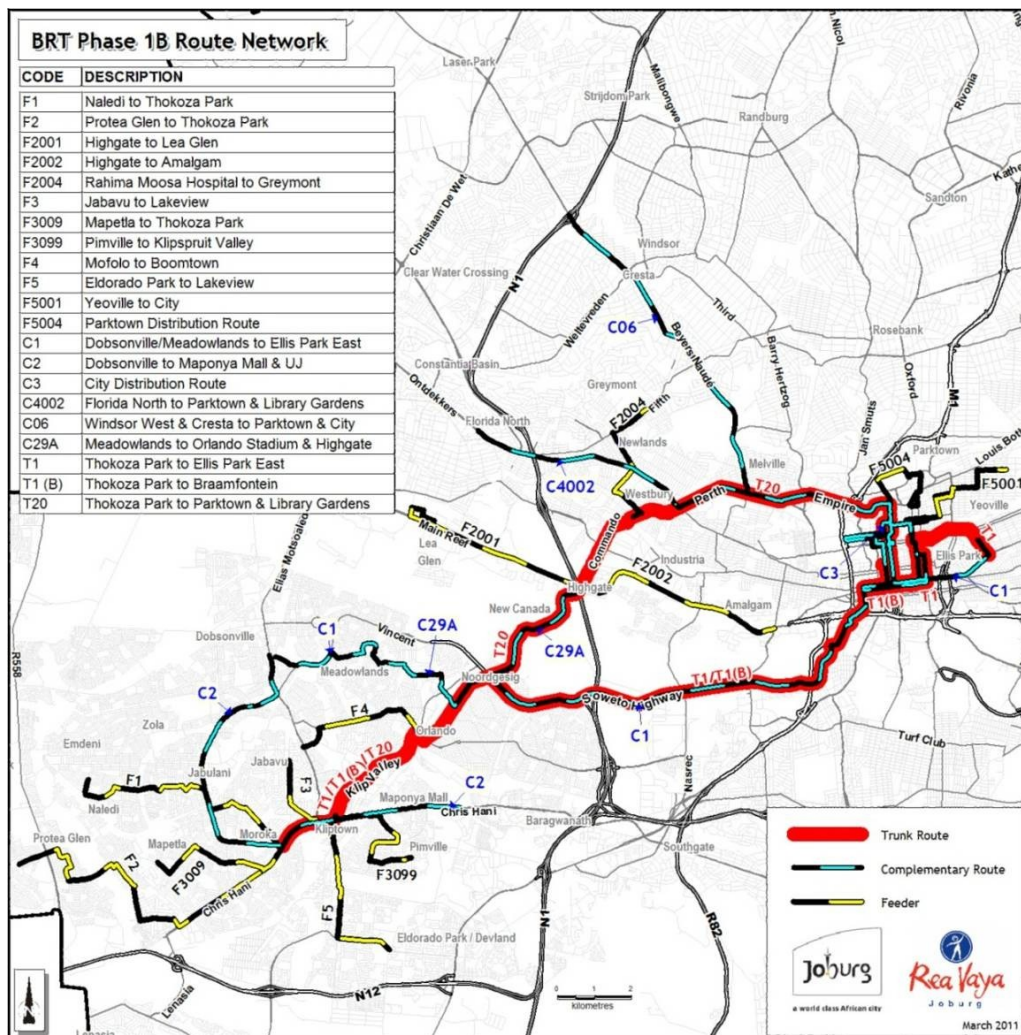
Today Phase 1A services carries 43 000 passengers per day and travels 6,5 million kms per annum on the trunk as well as with feeder and complementary buses which travel in mixed traffic.

The second phase (Phase 1B) is planned to be operational in the second half of 2013 and will consist of 18.5 km of dedicated trunk route and will require 143 buses. This route will

also travel on an East-West axis across the City but cover a different area to the first phase. It is anticipated that between 40 000 and 50 000 passengers will use this service daily.

The table below sets out the routes for Phase 1A and 1B.

Planning for the third phase (Phase 1C) is underway. This is a North-South route from the inner city to a previously disadvantaged township called Alexandra in the NE and then to the newer CBD and business hub of Sandton. The routes are still to be finalised.



4.3. Key features of the Rea Vaya BRT

The key features of the Joburg BRT mirror BRT systems elsewhere in the world. They include:

- Ironic state of the art *dedicated BRT stations* to be used by high floor buses and designed to enhance easy access and quick boarding by commuters. All stations are fitted with electrically operated doors that are opened by the bus drivers when they dock at the station. Stations are designed to make use of natural light and ventilation with a modular design, which are built offsite and assembled onsite in six weeks. Stations are accessible from both sides to accommodate the two way flow of passengers. Access to the stations is controlled by access gates

- Dedicated trunk lanes with medians painted red and separated with yellow rumble strips. By pass lanes are provided at stations for express operations.
- All stations and buses fitted with CCTV cameras and can communicate to a central control room. There are variable message screens for travel information.
- Off board fare collection using automatic bank based fare collection system which is in the process of being operationalised;
- A system of trunk, complementary and feeder routes operated on by clean and energy efficient buses of at least Euro IV standard. All Rea Vaya buses are of a high-floor 940mm from road surface design with access to stations level with the floor height of the bus. 18 metre articulated buses have three boarding doors and 13 metre feeder buses two, which allows for faster and a larger number of passengers to get on and off with ease;
- Feeder buses also load passengers at street level but are equipped with wheelchair lifts and wheel chair parking areas in the bus for people with disabilities;
- A distinctive brand (called Rea Vaya) with distinctive livery for stations and buses;
- State of the art depots which are owned by the City; and
- 12 year contract with a bus operating company owned and managed by operators who were previously operating on the routes now operated on by the Rea Vaya BRT.

This system functions as follows:

- Service levels and frequencies are determined by a Scheduled Services Management Agency (SSMA) – staffed by City of Joburg officials;
- Buses are tracked in real time with a global positioning facility from a central control room of the SSMA to determine whether buses are on schedule and on correct routes
- Bus arrivals are displayed in stations and buses on variable message screens
- CCTV cameras are also strategically placed in station precincts and along the trunk routes to enhance security and to monitor illegal use of the exclusive roadways
- A distance-based fare collection system operating on a bankcard platform is being introduced that will control access to stations and buses. This allows passengers to load funds on to the card for easy use when travelling.
- The buses are owned in Phase1A by a private bus operating company, made up of affected operators.
- The bus depot is built by the City and handed over to the bus operating company free for the duration of the contract.

Pictures of some of these features are included in ANNEXURE A.

The Transport Department is also concluding a “Sustainability Study” which is reviewing the sustainability of some of the above features and proposing amendments which will enhance the standard and also enable further integration especially in respect of walking and cycling.

4.4. Financing and funding

A sustainable funding model for Rea Vaya BRT is still being evolved. Below we spell out where the financial resources for the Rea Vaya BRT came/comes from for the first two phases:

What	Phase 1A	Phase 1B
Construction of infrastructure (roadways, stations, depots, ITS) Installation of AFC systems	National government grant funding – Public Transport Infrastructure and Systems Grant (PTIS)	National government grant funding – Public Transport Infrastructure and Systems Grant`
Bus operating costs	Fare revenue City operational subsidy National government operational subsidy	Fare revenue City operational subsidy National government operational subsidy – new fund being introduced called Public Transport Operating Grant
Station operating costs	Mostly national government operational subsidy but will shift to City over period of the contract	Ditto
Bus procurement	City facilitated ECA funding from BNDES (Brazilian Development Bank) at good interest rates for the Bus operating company to pay for the buses	PTIS once off amount. As a result the City has to own the buses for the bus operating company to run the bus service. Possible instalment sale after year 5, pending performance of the bus operating company and compliance with legislative processes including public consultation.
Bus maintenance	Bus operating company	Bus operating company

Some of the reasons why the City decided to pursue ECA funding for Phase 1A were:

- Very competitive interest rates;
- The duration of an international loan could be negotiated for a longer period than local loans; and
- A newly established Bus Operating Company would not have developed a profile strong enough to raise the funding on its own in the local market

However while the funding solution was cost effective to the operator it was transaction was very costly or the City and also holds a number of risks including a contingent liability. Due to the City wanting to reducing risks and costs to itself as well as due to the way in which the buses are viewed in terms of international accounting standards, the City in Phase 1B and future phases is likely to own the buses, at least for some part of the contract.

4.5. Stakeholder relations and engagements

In recognition of the significant role that taxi and bus industries play in the country's economic growth and in line with best practices of successful BRT systems around the world, the City of Johannesburg has rolled out the Rea Vaya system together with affected taxi and bus operators.

The City of Johannesburg has ensured the active participation and involvement of many role players and interest groups including:

- Informing and consulting members of the community who would be affected by the construction of Rea Vaya BRT – e.g. residents and businesses along the BRT routes.
- In 2007, the City of Johannesburg signed Memorandum of Understanding (MOUs) with the public transport operators in the mini bus taxi and bus industry who were to be affected;
- Co-ordinating regular intergovernmental forums with all government role players and a stakeholder forum involving external role players; and
- Consulting and involving members of the public on a look and feel exercise in respect of the buses and stations and then again in 2011 in respect of improvements to be made.

As is evident from the chronology attached as ANNEXURE C, the process of stakeholder engagement was not all smooth sailing. While most stakeholders welcomed the project, sections of the taxi industry were very opposed to it, including through the use of violence and court action.

It was a tribute to the determination of the political leadership of the country as whole and the City in particular, that despite threats and acts of violence, the BRT was supported, protected and enabled to continue.

How well has Rea Vaya performed

In this section we provide a snap shot of at how well the Rea Vaya BRT has performed in respect of the following criteria. By the time the peer review will have been conducted, an extensive sustainability study will have been completed for consideration by the panel.

Issue	Performance
Number and length of Trunk routes – quality of design, construction and maintenance	<p>In general the trunk routes have performed well. There have been internal problems of maintenance and parts of the route are often dug up for the installation of services and then reinstatement is not to the same quality.</p> <p>There are road safety challenges in some areas – especially in relation to pedestrian safety.</p> <p>There is a significant problem of other vehicles using the dedicated BRT routes. This is due both to high levels of congestion and lack of adequate enforcement.</p>
Quality of Stations design and construction	<p>The City is generally satisfied with the design of stations and some modifications and improvements have already been done such as a minimal number of chairs, storage space for cleaning and lockers for station staff.</p> <p>An ongoing problem is reliable electricity supply.</p>
Depots	<p>Three depots have been planned for the Rea Vaya BRT but only one completed. It is a state of the art depot with many innovative features especially in respect of the use of renewable resources and energy conservation.</p>

	Due to problems of land acquisition, the other two depots have been slower to take off and this has impacted on the number of dead kms that some buses are required to run.
Number and kind of buses	Phase 1A buses are Euro IV. The City has generally been satisfied by the performance of the buses and the availability of Euro IV fuel. Passengers complain about the lack of heaters and this and a few other modifications have been introduced for Phase 1B buses. Phase 1B buses will be Euro V.
Ridership	On average passenger numbers are around 40 000 per day. At peak, the buses are very full but off peak and in the counter direction there are challenges. It is hoped that when the AFC is introduced, there can be a way to incentivise off peak use. When Phase 1B is introduced there will be a 'network' as opposed to a single route and it should lead to further increases in ridership.
Bus operating company performance	The bus operating company performance has improved since take off in February 2011. Penalties are minimal and relate mostly to missed trips. However there is a significant need for skilled BRT operators and for ongoing training and capacitation of drivers, management and shareholders.
Station management	The station management model which includes having cleaners, ambassadors, marshals and cashiers at each station is very expensive and was not anticipated in the original model. It however has contributed to passenger confidence in the system.
ITS (control room, public transport management systems)	There have been significant problems in operationalising ITS features such as variable message signs, communication with drivers etc. This can be attributed to the fact that this was a developmental system and has not been introduced before in South Africa. A further contributing factor is problems with consistent electricity supply
Automatic fare collection	This has also been fraught with technical and contractual problems. The AFC was meant to have been introduced when the system commenced but due to a number of reasons this has not been possible. We are currently implementing one of the first full bank based EMV card systems in the world.
Financial performance	When the BRT model was first conceptualised, it was anticipated that national funding would cover infrastructure costs and fare revenue would cover the rest. This has not happened and the project would have been cash strapped if it was not for the operational subsidy being provided by national government as a result of the flagship nature of the project. Going forward, sustainability is a significant issue.

What has been the impact of Rea Vaya?

It is difficult to measure impact in respect of a system that only the first phase of which has been operational for four years. Below we highlight impact and potential impact going

forward. As mentioned earlier, the forthcoming sustainability study will also address impact more systematically.

Issue	Impact
Economic impact	An economic impact study on Phase 1A and 1B has been done which showed that both were proven be economically inefficient when considered purely on the basis of the transport related benefits. Phase 1B is just economically efficient in this same category. Both phases become economically efficient when broader societal benefits are included in the analysis. See study attached as ANNEXURE D.
Political	The Rea Vaya has been seen as a flagship project for the City, the province and the country as a whole. It has built the reputation of Joburg as a city committed to public transport transformation, changing course, being innovative and committed to a green agenda.
Catalytic potential	<p>Increasingly the BRT is also being seen as a catalyst for integrating public transport modes and for integrating public transport with walking and cycling to implement the City's Growth and Development Strategy goal of making walking, cycling and public transport the mode of choice by 2040.</p> <p>Initiatives to achieve this include:</p> <ul style="list-style-type: none"> • Developing a long term integrated network for public transport, walking, cycling and freight movements and modes; • Introducing and rolling out the concept of "complete streets" to retrofit or build new roads in a way that roads can be accessible and attractive to all road users • Developing the concept of dedicated BRT lanes to consider other forms of managed lanes such as counter flow, dedicated by-pass lanes for public transport and cycle lanes to enable road space to be used differently; • Linking land use and transport planning to develop mixed use developments around and along public transport nodes, precincts and corridors; and • Campaigns and community partnerships to promote walking, cycling and public transport as well as road safety including "open streets" on identified days of the year.
Job creation	Over 7 000 short term jobs have been created and about 800 permanent jobs in the City, station management and in the bus operating company.
Public transport transformation	To date only a small number of total commuters in the City have had their public transport transformed. However the BRT hold the promise for further transformation of public transport, both from the view point of commuters and operators.
Economic empowerment	Over 300 previously disadvantaged taxi operators are no longer in a marginal taxi industry business but are shareholders in a bus operating company. Work has not been yet been done to establish whether the individual operators are more wealthy and/or have invested their shareholder income to generate further wealth.
Environmental sustainability	The Phase 1A and 1B have been registered as the fourth carbon credit bus project in the world. However this has not generated any income for the City to date. The new buses do generate fewer emissions and have replaced vehicles which were polluting.
Accessibility / Impact on social equality (?)	It is too early to determine the impact on social equality.

What are the challenges and issues facing Rea Vaya at present

For purposes of the peer review, the following questions and issues could be addressed:

Land use and planning	How do we best integrate land use, environmental and transport planning in respect of BRTs to achieve the City objectives of sustainable human settlements, local economic development and a low carbon economy?
Active citizenry	How does and how can the BRT further contribute to empowerment of operators, transformation of the informal to the formal public transport sector and actively involved residents during the implementation phases as well as involving commuters in actively giving feedback to improve the service?
Operational excellence	How can the Rea Vaya BRT achieve operational excellence in all areas of operation including roadways, stations, buses, depots and intelligent transport systems?
Skills and capacitation	How can Rea Vaya BRT be adequately capacitated and how can it contribute to skills development and capacitation across the transport sector?
Finances and funding	How do we achieve financial sustainability of BRT systems including in innovative ways such as through land value capture and carbon financing

Conclusion

The City of Joburg is looking forward to sharing its experiences and learning from peers during the Metropolis Peer Review. It is hoped that the Peer Review will be able to enhance our own system as well as contribute to understanding and growing the BRT movement in major cities around the world.

Annex

- A: Pictures
- B. Chronology

A: REA VAYA PICTURES

Rea Vaya bus docking at inner city station: Note art work on all stations



Aerial view of inner city Rea Vaya station





Station on freeway with pedestrian bridge: note red painted strip in the median and yellow rumble strips



Rea Vaya Meadowlands Depot: administration building



B: Chronology - The Rea Vaya BRT journey

Date	What occurred
August 2006	Study Tour arranged by City of Johannesburg to Colombia and Ecuador for city officials and bus and mini bus taxi operators that would be affected by the introduction of BRT.
November 2006	City of Johannesburg council adopts resolution to upscale Strategic Public Transport Network (SPTN) in Integrated Transport Plan to full Bus Rapid Transit in Johannesburg to be known as Rea Vaya.
August 2007	Executive Mayor leads a delegation to Bogota comprising representatives of 17 of the 18 mini bus taxi associations that are affected.
October/December 2007	Public transport operators sign Memorandum of Understanding to co-operate in respect of the implementation of BRT. This is signed by the leadership at the time of Top Six Taxi Management and Greater Joburg Regional Taxi Council. However a number of operators are not happy about this.
4 November 2008	Prototype Rea Vaya station is opened in Joubert Park in Joburg CBD.
24 March 2009	National taxi strike called by an organization called UTAF which has been formed by taxi associations opposed to the introduction of BRT.
20 April 2009	National taxi association SANTACO invites President Zuma to national meeting on the eve of the general election where he agrees that 'we should hold our horses' until such time as a new administration comes into place. As a result the first phase of BRT which was meant to be ready for the international Confederation Cup in June 2009 is postponed until August 2009.
12 August 2009	Formal negotiations begin with a negotiation team of affected taxis operators to participate in a bus operating company. While the taxi industry is divided, sufficient support has been obtained by a section of the taxi leadership to receive mandates to start negotiations.
28 August 2009	An urgent court action is launched by UTAF to stop the Rea Vaya buses from going ahead but fails in the High Court.
30 August 2009	Rea Vaya BRT is launched with 40 buses only on the trunk route. There is high tension and threats of violence. The service is operated by an interim bus operating company, called Clidet who had a management contract with Metrobus while negotiation are proceeding with affected taxi operators.
1 September 2009	Rea Vaya BRT starts operating. All buses are full due to 'unofficial taxi strike'.
2 September 2009	Two Rea Vaya busses came under fire close to Nancefield hostel – 2 people, including a policewoman was shot at and injured.
Late Feb/Early	City announces intention to introduce feeders. UTAF and taxi

Date	What occurred
march 2010	<p>industry who are opposed to introduction of Rea Vaya threaten national strike. Postponement is agreed for two weeks until 15th March.</p> <p>Three feeders are introduced although there is a taxi stay away and a large number of attacks such as throwing of stones at Rea Vaya buses.</p>
April/May 2010	Further feeders are introduced. Two buses are shot at and 13 people injured. One passenger passes away.
9 June 2010	City and taxi industry negotiating teams reach agreement on key aspects of bus operating contract and the fee per km in the negotiations.
June/July 2010	Rea Vaya successfully carries approximately 10 000 passengers per match during the 2010 Soccer World Cup
28 Nov – 1 December 2010	Talks about talks held with operators affected by Phase 1B. Unlike Phase 1A, operators that were previously opposed to the process participate. Bus operators participate for the first time – in Phase 1A only taxi operators were affected.
6 December 2010	Last feeder introduced – with no violence or resistance.
1 February 2011	Piotrans – company made up of affected taxi operators in partnership with Fanalca, a South American BRT operator – take over operations from the interim bus operating company
8 February 2011	<p>Takeover of Piotrans celebrated as well as first taxi to be scrapped symbolically scrapped at an event.</p> <p>Operators who wanted to become shareholders in Piotrans had to hand in their taxis and their operating licenses to become shareholders. They also had to put in equity almost equivalent to the amount they received from the taxi scrapping agency for scrapping their taxi.</p>
September/October 2011	Five week strike by Piotrans drivers over salary and recognition issues. Buses do not operate and it takes a while for patronage to return.
1 August 2012	<p>Fanalca had wanted to become an equity partner in Piotrans after one year of operation. However there was a breakdown in the relationship and they exit the partnership.</p> <p>Piotrans appoints an Executive Chair and restructures to continue operations.</p>
October 2012	Depot in Meadowlands officially opened
3 December 2012	Negotiations with Phase 1 B affected operators begin.
24 April 2013	AFC operations commence (anticipated)