

# **Socio-economic Challenges within the Transport Sector Hindering Sustainable Transport in the City of Johannesburg**

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## **Abstract**

The study is based on 12 organisations which, according to the paper, are stakeholders within the transport sector. The study argues that until these organisations pay attention to socio-economic factors which also fall under the indicators of sustainable transport, they will see no progression of sustainability in the South African transport sector. The mandate of these organisations is mostly found in a company/organisation's mission and vision statements, strategic plan, sustainable reports, etc.

## **Keywords**

Sustainable transport, socio-economic challenges, poverty, unemployment

## **1. Introduction**

Each and every organization in South Africa as a mandate should be to create employment opportunities to eradicate poverty. The same aim should be one of the goals of transport sector organizations to have as a mandate to come up with solutions to this socio-economic challenge that the country is sitting with. These expectations are not only for the South African government but also for all organisations in the transport sector to contribute to sustainable transport. So far the organisations in transport most do not have sustainable report which show relevant social responsibility, corporate social investments and renewable energy initiatives or projects which are sustainable in a way of creating jobs, supporting relevant communities in alleviating poverty and contributing to sustainable transport. Collaboration and integration in this sector concerning the enterprise development and sustainable transport is also very low or non-existent. This paper seeks to find out if by integrating transport sector organisations they can collaborate and come up with initiatives which will contribute to sustainable transport and the reduction of poverty and unemployment. The study uses qualitative methodology to collect and analyse data using the Siedel process model for data analysis, figure 1.1. It is evident that the mandate for transport sector stakeholders is enforced by the law to ensure sustainable transport, reduction of poverty and unemployment. The City of Johannesburg is going green and as such organizations around the city are also mandated to go green while ensuring economic development that benefits those who were previously disadvantaged.

Through the literature review, the study highlights different types of strategies as given in table 1.1. It could be the vision, mission, strategy, aims or objectives of the organization reflected in their core work or current/past innovative projects. The study reviews 6 stakeholders in both the public and private sector and also government municipalities and departments. The aim of the study is to show the importance and independence of sustainable transport as a solution to other socio-economic challenges South Africa is facing. There is a view that all the stakeholders should be mandated to ensure the creation of employment and contributing to enterprise development through the involvement of those who were previously disadvantaged. According to Verwey (2011) enterprise development is a tool that all South African organizations and companies can use within their structure to take up the challenge and make a difference. ITP (2013) shows that the city of Johannesburg's unemployment and poverty rate; is very high and is one of the highest levels within South African society. Reduction of poverty and unemployment is also the first principle

of the National Spatial Development Plan (NSDP). ITP (2016) states that the first principle of the NSDP, as a prerequisite for alleviating poverty is development which must ensure sustainable and inclusive economic growth. This study focuses on the organizations and companies within the CoJ metropolitan. The aim is to identify the lack of integration among transport sector stakeholders, also identifying what steps can be taken to turn the socio-economic challenges the city is facing into opportunity. ITP further states that 1 696 520 people, which is 72% of the population of the city, are working while 564 970 people, which is 28%, are not working. The transport sector can play a role in the creation of employment through enterprise development, through creative and innovative projects as a result of collaboration and integration of the stakeholders in the transport sector.

## **2. Impacts of sustainable transport indicators**

### **2.1. Social and Economic indicators**

According to Steg and Gifford (2008), finding out the balance between sustainable developments indicators (environmental, social and economic) implies qualities within the transport sector. Kalok (2011) also argued that along these lines, the main idea being to build a transport system supporting a balanced development by integrating economic, environmental and social goals while considering the needs of different interest groups. The groups can create a win-win situation by using enterprise development as a tool to create opportunities which affect sustainable transport indicators. These indicators are also the drivers of transport such as mobility, renewable fuel and infrastructure. The external factors are also one of the transport factors in the socio-economic context of South Africa. According to Kalok (2011), social or economic indicators can create accessibility to public services and employment opportunities corresponding to social and economic aspects, respectively in sustainable transport. The Department of transport (DoT) in as much as it desires to ensure the affordability and reliability of public transport, it also still needs to ensure it creates jobs and aids in reducing poverty. Kane (2010) and Moody (2012) argue that South African transport planning is habitually in favour of working commuters with money to spend on quality roads and public transport. According to Moody (2012), in developing countries the imbalance is particularly problematic as towns primarily designed to service car mobility are best suited to the of the middle class for their convenience, while the poor, without access to private cars, are at a disadvantaged and as a consequence, green mode movements are discouraged. It is about time all sectors look into opportunities which will lead to employment and sustainable enterprise in addressing socio-economic challenges.

There are socio-economic factors which are constantly affecting the development of the transport sector in South Africa, which happens to be a basic need. Unemployment and poverty which is the main challenge South Africa is facing today, affects each and every sector in such a way that it becomes a priority of every organization, whether it is civil society, the public or private sectors all need to make an input which will contribute in the supplier and enterprise development. The transport sector and all the related stakeholders are facing these challenges. The creation of jobs being one aspect in poverty alleviation, the other is enterprise development, where organizations have to develop a value chain which will result in a sustainable enterprise. According to D'heur (2015), organizational pressures from various stakeholder groups are constantly increasing in a way that value chains need to be newly designed and organized to fit within the country of operation due to their increasingly large role in economic factors, environmental and social issues. The value chain should be in a way that organizations procure locally with the law being observed.

### **2.2. Environmental Indicator**

To meet sustainable transport, the city needs to have good mobility and also contribute much less when it comes to CO<sub>2</sub> emissions and the global warming. This could be possible through the use of technologies which are able to generate less CO<sub>2</sub> emissions. South Africa is currently looking into these different technologies as well as the developments in ensuring sustainable transport. In table 4.1, the development of BRT buses and using euro engines implemented by Metrobus, this is quite a step forward for the country, the other intervention being the Gautrain and other public transport such as the privately owned bus organizations. The last intervention which is also in the development process is natural gas. There are arguments that this type of fuel is even cleaner than renewable fuel but the production process natural gas requires the generation of CO<sub>2</sub> emissions during the depletion of the fuel. According to Kwon (2016), current power production systems depend on greatly on fossil fuel, which results in air pollution problems, including greenhouse gas emissions. A wide range of studies have been conducted to address this problem

but for a more radical approach, it is essential to develop new energy resources as alternatives to conservative fuel sources and their conforming energy systems. The DoE (2016) states that factually, energy demand and its economic importance was major, the energy sector systematically requires significant investment in supply capacity. Before such decisions were primarily driven by maintaining supply security as a concern, without giving full consideration to the economic, environmental and social impacts of all alternatives. As the construction of extensive capital supply facilities was towards results propensity and neglecting of another possibilities that might have be cost effective in the long term with job creations benefits and more favourable environmental impacts.

The transport sector needs to look at the main contributor of unsustainability. Several researchers (Moody, 2012; Black, 2010; and Kwon, 2016 have identified fossil fuel as the main contributor of global warming and high CO<sub>2</sub> emissions. According to Walters (2013), the challenge facing government now, is to find a way to provide affordable, safe and accessible public transport to townships, rural and urban areas. Kane (2010) supports this statement by asking a question about; how South Africa will be able to achieve sustainable transport while addressing the inequality and poverty challenges the country is currently facing? Overa et al (2013), states that several studies in Sub-Saharan Africa mention that apart from daily challenges caused by unsustainable transport systems, a number of studies identify that a link for factors hindering sustainable transport and limiting access to the necessary resources to escape poverty. The smaller contribution of biodiesel manufacturing so far, is the use of renewable fuel, there is evidence that in South Africa for more than ten years has been a manufacturer of renewable energy at a small scale. Kane (2010) mentions that the Department for International Development (DfID) in the World Bank and the UK established and supported their associates need for ensuring a reduction in poverty, inequality and enhanced sustainability. These manufacturers are in the biofuel sector, producing biodiesel using used vegetable oil. There are also manufacturers of biogas through generating methane from municipal waste deposits in the landfills. There are many projects which are in the process and a few vehicles being used as an example of the possibilities of turning biogas into renewable fuel. The aims of renewable energy in South Africa is also to reveal opportunities which will eradicate poverty as well as creating employment. Every project which is being implemented in South Africa needs to have these socio-economic goals in mind and this needs not be for a short while but something sustainable.

### **3. Research and Methods**

The research method for this study is qualitative and uses the data analysis process shown in figure 3.1. The study was conducted through a desktop research, describing and evaluating the current situation of sustainable transport with all the relevant stakeholders. The study used the exploratory method to conduct this research. According to Saunders (2012), exploratory study helps to ask open questions to find out things that have been happening and gain insights the interest of the topic. Review of the organisation or company mandate for prominent issues that are currently hindering the development of sustainable transport. Nine transport stakeholders' strategies (vision, mission, objectives and aims) were identified and two stakeholders where interviewed with the status of sustainable transport namely City of Johannesburg and Metrobus.

The desktop research which serves as a literature survey for all the transport sector organisations and companies, where relevant information was collected in each organisation and further finding out the status quo of sustainable transport as the main theme is on sustainable development and creating sustainable employment opportunities. Where three organisations (Scania South Africa, Metrobus and CoJ) were found to be doing something about sustainable transport in terms of reducing the harmful effects to the environment, more clarity was needed, hence a need to follow up with interviews. According to Nieuwenhuis (2010), figure 3.1 represents three essential elements: noticing, collecting and reflecting, interlinking and cycling reflection on the data collection, notice the gap that requires additional data that needs to be collected.

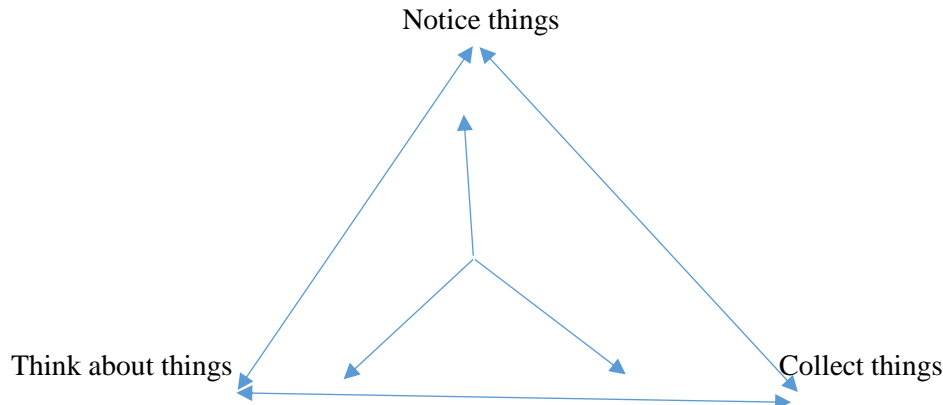


Figure 3.1 the Data Analysis Process: Nieuwenhuis (2010) from Seidel (1998)

### 3.1. Notice things

It was found out that for most of the transport sector organisations’ sustainability reports, there was no sustainable enterprise development which address both the sustainable transport, reduction of poverty and unemployment. Renewable energy is one huge field which can create employment as well as contribute to sustainable development by replacing fossil fuel. It was interesting to find out what is it that the two stakeholders (Metrobus and Scania South Africa) are currently doing in the field of sustainable transport.

### 3.2. Collect and think about things

There was a need to find the main hindrances for the transport sector organisations or companies not able to meet their main mandate which the South African government is expecting to be achieved by each and every organisation in operation. Currently in South Africa, there is no organisation which manufacturing renewable energy, supplying to a stable market. There is a huge gap in terms of commercializing and utilization of renewable energies.

## 4. Findings and discussions

Table 4.1 Strategy Statements for Transport Sector

Transport Sector organisations	Vision/Mission/Strategy	Source
Rea Vaya (BRT)	<p>Rea Vaya goes green</p> <p>“If only 15 percent of car users who live close to the city switch to Rea Vaya, carbon dioxide emissions can be cut by 1,6 million tons by 2020.</p> <p>Because Rea Vaya offers a fast, convenient, safe and affordable alternative form of public transport, the City of Johannesburg hopes to persuade people to switch their mode of transport, alleviating congestion and pollution.</p> <p>An extensive study analysing passenger traffic along the trunk routes of the system’s corridor was conducted to investigate whether Rea Vaya</p>	<p>Reavaya: 2016  <a href="http://www.reavaya.org.za/welcome/rea-vaya-goes-green">http://www.reavaya.org.za/welcome/rea-vaya-goes-green</a>                      Last accessed: 10/06/2016</p>

	<p>will have a noticeable and positive effect on greenhouse gas emissions and on the environment. The answer in both cases was an emphatic yes.</p> <p>It is clear that Rea Vaya is the single largest climate change initiative ever undertaken by the City and represents a major turning point in how it deals with congestion, pollution and greenhouse gases caused by transportation.</p> <p>In addition, Rea Vaya buses are the cleanest on the continent, running on low-sulphur diesel with the most advanced pollution reduction equipment. They reduce nitrous oxides, the most dangerous health risk from vehicular emissions, by thousands of tons a year and particulate matter by hundreds of tons annually.”</p>	
Gautrain buses	<p><b>Aim</b>                  “The Gauteng Growth and Development Strategy aims to grow the economy to at least 8% by 2014, contributing to the national effort to halve poverty and unemployment. This growth strategy seeks to not only increase growth rates but to translate this economic growth into job creation and economic development. Gautrain, by creating 93 000 jobs during construction and 2 500 jobs per year during operation as well as growing the Gauteng GGP by almost 1%, is a major contributor to this strategy.</p> <p><b>Objectives</b>                  Accelerated economic growth, development and infrastructure delivery, with emphasis on:</p> <ul style="list-style-type: none"> <li>• job creation;</li> <li>• quality service delivery;</li> <li>• good governance;</li> <li>• SME development;</li> <li>• investment in black economic empowerment;</li> <li>• convergence of Public-Private Partnerships; and promotion of tourism.”</li> </ul> <p>With the implementation of the Gautrain Rapid Rail Link project the GPG also strongly considered the improvement of transport and land use co-ordination and the integration of the different modes of transport. The image of public transport will also be improved with the Gautrain. Other objectives of this project include the:</p> <ul style="list-style-type: none"> <li>• strengthening of existing development nodes in Gauteng;</li> <li>• promotion of urban restructuring and redevelopment;</li> <li>• facilitation of the revitalisation of the Johannesburg and Tshwane central business districts; and</li> <li>• Improvement of accessibility and mobility in the Johannesburg and Tshwane corridor.</li> </ul> <p>As mentioned before, an important objective of the project is to alleviate the traffic congestion on existing roads between Johannesburg and Tshwane. It is Government’s policy to promote public transport as an alternative to the private car by ensuring the provision of adequate public transport infrastructure, facilities and services.”</p>	<p>Gautrain: 2016  <a href="http://www.gautrain.co.za/about/about-gautrain/objectives/objectives/">http://www.gautrain.co.za/about/about-gautrain/objectives/objectives/</a>                  Last accessed: 10/06/2016</p>
Metrobus	<p>“Metrobus Going Green for the environment: Diesel Dual Fuel (DDF) Buses as a strategic project CNG Conversions project                  Global warming continues to threaten the peaceful existence of humankind. Vehicle exhaust emissions and increasing energy crisis are</p>	<p>Metrobus : 2016  <a href="http://www.mbus.co.za/index.php?option=">http://www.mbus.co.za/index.php?option=</a></p>

	<p>among critical issues that will propel corporates to look at alternative means of doing business in the future.</p> <p>Metrobus as a public transport provider has taken the leadership in making a change, through its strategic objective of going green and undertaking the initiative to convert some of its current diesel buses to Diesel Dual Fuel (DDF) and procuring the Euro-5 DDF buses, which are friendlier to the environment in terms of carbon emissions.</p> <p>The Company has in partnership with the University of Johannesburg undertaken a pilot project aimed at converting some of the current diesel run buses to Dual Diesel Fuel, a technology that allows for substitution of diesel a fossil fuel with natural gas, which emits less carbon emissions into the atmosphere. This project is a first in South Africa, and the company aims to be the leader by developing a Centre of Excellence on Natural Gas vehicle conversions</p> <p>In the financial year 2014-2015, the company converted 30 buses, thereby contributing positively on the climate and giving the aged buses a new lease of life. There are plans underway to convert an additional 60 buses in the financial year 2015-2016, which will see an increase to 90 converted buses, adding the 150 new Euro-5 DDF buses, the company will have about half its fleet being environmentally friendly and as such minimizing the impact of carbon emissions into the environment.”</p>	<p><a href="http://www.putco.co.za/content&amp;view=article&amp;id=86&amp;Itemid=87">com_content&amp;view=article&amp;id=86&amp;Itemid=87</a></p> <p>Last accessed: 10/06/2016</p>
Putco	<p>Vision</p> <p>To develop and grow into the leading transport company in South Africa</p> <p>To maintain high moral and ethical standards</p> <p>To employ proud and happy people</p> <p>To be diversified, robust and flexible</p> <p>To be a broad-based empowerment company</p> <p>To be customer focused and performance-driven</p> <p>To be successful and respected</p> <p>To be profitable and sustainable</p>	<p>Putco : 2016</p> <p><a href="http://www.putco.co.za/index.php/2016-02-08-12-02-31/vision">http://www.putco.co.za/index.php/2016-02-08-12-02-31/vision</a></p> <p>Last accessed: 10/06/2016</p>
City of Johannesburg (CoJ)	<p>“The Corridors of Freedom will transform entrenched settlement patterns, which have shunted the majority of residents to the city’s outskirts, away from economic opportunities and access to jobs and growth. Gone will be the days of being forced to rise at dawn to catch a train, bus or taxi to a place of work. Families will be able to have quality time, with spouses and children sharing meals together in the evening</p> <p>The Corridors of Freedom represent a significant key opportunity to address and successfully implement the developmental goals of the City as outlined in the Johannesburg Growth and Development Strategy 2040. The approach outlined in the Strategic Area Framework therefore recognises the potential of the Corridors to realise a number of high level outcomes and long-term benefits:</p> <ul style="list-style-type: none"> <li>• Improved urban efficiencies</li> <li>• Viable public transport service</li> <li>• Reduced car dependency and shorter trip lengths</li> <li>• More people closer to work, shopping and leisure opportunities</li> <li>• Lower per capita infrastructure cost</li> <li>• Accessibility to economic and social opportunities</li> <li>• Economic, social and environmental sustainability</li> </ul>	<p>City of Johannesburg: 2016</p> <p><a href="http://www.joburg.org.za/index.php?option=com_content&amp;task=view&amp;id=544&amp;Itemid=9&amp;limitstart=6">http://www.joburg.org.za/index.php?option=com_content&amp;task=view&amp;id=544&amp;Itemid=9&amp;limitstart=6</a></p> <p>Last accessed: 10/06/2016</p>

	<ul style="list-style-type: none"> <li>• Reduced energy consumption and carbon emissions – environmental benefit and improved health and quality of life</li> <li>• Residential and economic activities in areas where public transport is present</li> <li>• Solid basis and support for long-term investment</li> <li>• Enhanced liveability of neighbourhoods with improved public spaces</li> <li>• Spatial and social transformation</li> <li>• Curtailed urban sprawl, with densification and infill-development overcoming the burden of fragmentation of urban areas</li> <li>• Restructuring (Spatially and economically) the apartheid city toward a more integrated city form, which seeks to make the city more accessible to disadvantaged groups</li> <li>• More efficient relationship between low-income housing, informal economies and public transport”</li> </ul>	
<p>Scania South Africa</p>	<p>Sustainability: At Scania South Africa, our sustainability efforts aim to transform our industry by focusing on significant impacts and opportunities across the value chain.</p> <p>Demand for transport is growing. At the same time, efficiency is becoming a key driver for customers. This means sustainability has to be a condition for building the business. As well as reducing our own footprint, our sustainability approach is about developing innovative, low-carbon products and services for all our markets, and working with partners upstream and downstream to cut impacts and create value.</p> <p>Strategic direction: In 2012 sustainability was further integrated into Scania’s business strategy. It is now a stated top management ambition to be regarded as a leading provider of sustainable transport solutions.</p> <p>Towards sustainable transport: Transport is vital for economic and social development but it must be sustainable. Scania wants to be seen as a leading provider of sustainable transport solutions. We will do this by working with others to drive down impacts in logistics and the distribution of goods, and provide safe, accessible and affordable personal mobility choices.</p> <p>How Scania works: Sustainability starts by doing things right at home. Scania is committed to high ethical, social and environmental standards wherever and with whoever we do business. That’s why in 2012 we signed up to the UN Global Compact.”</p>	<p>Scania: 2016 <a href="http://www.scania.co.za/about-scania-local2014/sustainability/">http://www.scania.co.za/about-scania-local2014/sustainability/</a> Last accessed: 10/06/2016</p>
<p>Department of Trade and Industry (DTI)</p>	<p>Vision A dynamic industrial, globally competitive South African economy, characterised by inclusive growth and development, decent employment and equity, built on the full potential of all citizens.</p> <p>Mission Promote structural transformation, towards a dynamic industrial and globally competitive economy; Provide a predictable, competitive, equitable and socially responsible environment, conducive to investment, trade and enterprise development; Broaden participation in the economy to strengthen economic development; and</p>	<p>DTI: 2016 <a href="http://www.thedti.gov.za/about_dti.jsp">http://www.thedti.gov.za/about_dti.jsp</a> Last accessed: 10/06/2016</p>

	<p>Continually improve the skills and capabilities of the DTI to effectively deliver on its mandate and respond to the needs of South Africa's economic citizens.</p> <p>Strategic Objectives</p> <ul style="list-style-type: none"> <li>• Facilitate transformation of the economy to promote industrial development, investment, competitiveness and employment creation;</li> <li>• Build mutually beneficial regional and global relations to advance South Africa's trade, industrial policy and economic development objectives;</li> <li>• Facilitate broad-based economic participation through targeted interventions to achieve more inclusive growth;</li> <li>• Create a fair regulatory environment that enables investment, trade and enterprise development in an equitable and socially responsible manner; and</li> <li>• Promote a professional, ethical, dynamic, competitive and customer-focused working environment that ensures effective and efficient service delivery.</li> </ul> <p>It further aims to expand production in value-added sectors, places emphasis on more labour-absorbing production and services sectors and the increased participation of historically disadvantaged individuals in the economy, as well as interventions in three diversified clusters, namely:</p> <p>Cluster 1: Metals fabrication, capital and transport equipment, green and energy-saving industries, and agro-processing sectors;</p> <p>Cluster 2: Automotives and components, medium and heavy vehicles, plastics, pharmaceuticals and chemicals, clothing, textiles, footwear and leather, bio-fuels, forestry, paper, pulp and furniture, cultural industries and tourism, and Business Process Outsourcing and Offshoring (BPO&amp;O) services; and</p> <p>Cluster 3: Nuclear, advanced materials and aerospace sectors, to enable the country's long-term advanced capabilities.</p>	
<p>Department of Transport (DoT)</p>	<p><b>The Vision</b>              "Transport, the heartbeat of South Africa's economic growth and social development!"</p> <p><b>The Mission</b>              Lead the development of integrated efficient transport systems by creating a framework of sustainable policies, regulations and implementable models to support government strategies for economic, social and international development.</p> <p><b>The Values</b>              Maintain fairness and equity in all our operations;              Strive for quality and affordable transport for all;              Stimulate innovation in the transport sector;              Ensure transparency, accountability, accessibility; and              Upholding of the Batho Pele principles.</p> <p><b>The Strategic Objectives</b>              The objectives that we aim to achieve in providing a policy framework, regulation and implementation models are:              Competitive transport costs;              Safety and security improvements;</p>	<p>DoT: 2016  <a href="http://www.transport.gov.za/Home/AboutUs.aspx">http://www.transport.gov.za/Home/AboutUs.aspx</a>              Last Accessed: 10/06/2016</p>



	Reduce infrastructure backlogs; Improve access; and Reduce time in transit.	
Department of Energy (DoE)	<p><b>“Vision 2014</b> A transformed and sustainable energy sector with universal access to modern energy carriers for all by 2014.</p> <p><b>Vision 2025</b> Improving our energy mix by having 30% of clean energy by 2025.</p> <p><b>Mission</b> To regulate and transform the sector for the provision of secure, sustainable and affordable energy.</p> <p><b>Values</b></p> <ul style="list-style-type: none"> <li>• Batho Pele</li> <li>• Excellence</li> <li>• Professionalism</li> <li>• Integrity</li> <li>• Equity</li> <li>• Loyalty</li> <li>• Ubuntu</li> </ul> <p><b>Legislative mandate</b> To ensure secure and sustainable provision of energy for socio-economic development.”</p>	<p>DoE:2016 <a href="http://www.energy.gov.za/files/au_frame.html">http://www.energy.gov.za/files/au_frame.html</a> Last accessed: 10/06/2016</p>

Most of the organisations are still in the initial stage when it comes to contributing to sustainable transport. There are projects which were initiated before and failed but still there are projects which are either in the planning stage or that have just started. Some of the stakeholders have educational institutions on their initiatives and some have partnered with the government department in ensuring they meet the mandates expected from them by the government. The study will discuss the findings of each organisation or company below, to identify their status quo when it comes to ensuring sustainable transport.

#### **4.1. Metrobus**

Johannesburg Metrobus is the state owned transport organization under the administration of city of Johannesburg. The organization started operating in year 2000 in the transport industry, is one of the sectors which creates vast amounts of employment opportunities through employing drivers and other employees who ensure the operation of the transport industry. According to Beaudoin et al. (2015), public transit is viewed as an important component of efficient transportation systems, enhancing the mobility of travellers and improving the accessibility and liveability of a region. Through the usage of biofuel in partnership with Scania South Africa the main challenge is the supply side of the biofuel company producing ethanol. Metrobus Johannesburg had shown dedication in terms of the reduction of polluted air. Beaudoin et al (2015) states that investment in public transit is often advocated on the basis of its purported role in reducing traffic congestion and improving air quality.

Metrobus is one of the transport services providers in the Johannesburg area, providing a service to a vast number of citizens. Through the need of an environmentally friendly, job creating and poverty eradicating company, Metrobus decided to ensure that some of their buses are using biofuels instead of the fossil fuel. Metrobus (2014) states that energy supply for the transport sector in Johannesburg is predominantly based on fossil fuels and the problem with it is that the supply is limited, contributes to air pollution and generates greenhouse gas emissions which are harmful to the environment. For South Africa as a whole, there is the challenge of fuel security which was severely impacted upon by global developments, the resultant impact being rising and unstable fuel prices. That is the reason Metrobus sees a significant need to support the use and production of biofuels in South Africa which will play a role in the replacement of fossil fuel and resulting in many other positive impacts. Metrobus (2016) mentioned that it is mainly due to these reasons that a migration towards alternative sources of fuel such as compressed natural gas, biogas or bioethanol is being proposed. Currently in South Africa the only source of biofuels is through the small micro and medium enterprises (SMMEs). According to Pradhan (2014) there are about 200 small plants manufacturing biodiesel, mostly using used vegetable oil as feedstock which neither competes with food nor with agricultural land. Out of the

six strategic goals in Table 4.1 from the department of transport (DoT) none is renewable energy and SMMEs development initiatives.

#### **4.2. City of Johannesburg**

The City of Johannesburg has undertaken several projects to address sustainable transport especially in terms of public transport. One project is the BRT which is currently a huge success moving people from the township to places of work. This project is currently taking place in partnership with the Reavaya Company which is the main driver of the projects, it is also playing a role in supporting the initiative by Metrobus in the use of the Euro engine buses just introduced which use 50% natural gas and 50% diesel.

The City of Johannesburg in partnership with university of Johannesburg is working on a project for turning waste into renewable energy by getting methane within the metropolitan landfills and making biomass. The project has been in operation for a year now, where research students from the university are piloting the projects and planning to train the scrap and waste collectors within the city to be the ones to manufacture or refine the biogas later. There is no evidence of production of the biogas so far; however, some of the municipal fleet which is going green is mostly powered by the natural gas.

The city is also working on the mobility project where it has developed cycling lanes to encourage the public as well as students to cycle. The project is still in the initial stage as the lanes have not yet being utilised by the public.

Putco is one of the companies found to be very involved with B-BEE, enterprise development and procurement in uplifting the previously disadvantaged. Most of the projects the company is involved in contain educating as well as support through the B-BEE score cards of enterprise development. Empowering of women and youth is also one of their projects. This is one mandate from the government but this study concludes that nothing much has been done in terms of sustainable transport particularly in the environmental indicators.

### **5. Discussion and Recommendations**

The study emphasizes sustainable enterprise development which it is believed it will lead to sustainable transport from the biofuel sector. Ciliberti (2008) states that to adopt social responsibility, organisations need to go beyond the boundaries of a single firm and involve various stakeholders in achieving economic, social and environmental benefits within communities. There must be the integration of farming or the waste collection site up to the depletion of the renewable fuel. So far there are projects which are undertaken by Eskom on independent renewable energy, but all are mostly focusing on filling up the demand for electricity. The projects are successful because the independent contractors are local and mostly with B-BBEE score. The independent contractors have a stable market currently because they have contracts with Eskom which is in demand of energy to meet its capacity. Eberhard et al. (2014) state that the resulting program, currently known as Renewable Energy Independent Power Producer Procurement Program (REIPPPP), has successfully focussed on private sector know-how and investment into grid-connected renewable energy in South Africa at competitive prices.

Even though South Africa currently has numerous projects on natural gas which generates less CO<sub>2</sub> emission that has taken a set forward to ensure sustainable transport, the only challenge is, still the natural gas is not renewable so cannot be considered as sustainable. In the long run, with the depletion of minerals, South Africa will still be facing the challenge of fuel. According to Media South Africa (2016) Natural gas could be considered the most environmentally friendly fossil fuel as its CO<sub>2</sub> emissions per unit of energy is the lowest and is suitable for use in high efficiency combined cycle power stations. Burning natural gas produces about 30% less carbon dioxide than petroleum and 45% less than burning coal. Within the transport sector, the organisation/ stakeholders are so diverse such that there is a need for a value chain which is well supported by the government. All these other stakeholders, if their initiative is to be effective and efficient; and most important in achieving its purpose which is to eradicate poverty and create employment through sustainable enterprise development resulting in sustainable transport. According to Metrobus (2013), biogas is a renewable energy which is formed when Methane is released from waste streams such as solid waste and waste water. Biogas once cleaned can be injected into a CNG network and the two gases can be used seamlessly. There are opportunities to create Biogas supplies through agricultural feedstock development, waste water treatment technologies as well as solid waste treatment technologies. There are many stakeholders who can play a role in such matters, bus organisations, SMMEs and government departments. The need for integration among these stakeholders in order to achieve the first South African priority which is to ensure equality among South Africans through the creation of opportunities and new developments which will uplift the economy while reducing

unemployment and poverty. All these organisations are mandated by the law through what is called B-BBBEE score cards to achieve the goals set to them. This study reviews all the annual reports of the stakeholders as well as their mandate against what the organisations have done so far in practice. Organisations are currently struggling to come up with sustainable enterprise development which links their businesses with SMMEs to come up with a strong value chain. Timm (2015) states that needs transport sector stakeholders to integrate by working together and supporting each other's initiative as it arrives.

The City of Johannesburg, on the other hand, will have multiple projects in the transport sector which are looking into a modal shift and the green economy. However, in the main policy document, when it comes to sustainable transport, South Africa is still in a strategic level where there are no operational objectives or tasks which can be a lead to follow or a target which is supposed to be met through the different sectors affected. Every main objective needs to have sub-objectives which are the mini milestones to support the overall goal. According to Litman (2016), to achieve sustainability needs coordinated planning among different sectors, groups and jurisdictions as to expand the objectives, impacts and options considered in a planning process is helpful in ensuring that short term decisions are consistent with strategic and long-term goals.

## **6. Conclusion**

For future research, the study can be in a form of a comparison between the developed and the developing countries transport sectors, to see the gap as well as learning lessons for the City of Johannesburg to work towards improving sustainable transport. The socio-economic factors are the major delays of sustainable transport in most developing countries because other basic needs become more important and urgent than developing transport. Sustainable transport is very crucial because it prevents present and future problems caused by unsustainable transport. A transport sector well planned to work towards sustainable transport can create jobs and play a role in reducing the level of poverty.

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## **Biography**

**Sebonkile Thaba** is a PhD fellow and Lecturer in the Department of Transport and Supply Chain Management, University of Johannesburg, South Africa. She earned her M-Tech in Operations Management from University of Johannesburg. She presented and published 13 conference papers and one book chapter. Her research interest is on Transport sustainability, supply chain and enterprise development.