

Rea Vaya BRT System Progress and Service Delivery to Commuters since Implementation

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Abstract

The purpose of this assignment is to measure the extent that Rea Vaya Bus Rapid Transit (BRT) system has delivered transport services to commuters on the phase 1A route connecting Soweto (Thokoza Park station) and Johannesburg Central Business District (CBD) (Ellispark station). Five service quality dimensions were used to measure the level of service provided by Rea Vaya namely tangibles, empathy, assurance, responsiveness and reliability.

Positivism was used as the research philosophy, which is a scientific method that tests theories using structured and measurable methods such as a structured questionnaire and observations. Quantitative data was collected for this research, in a form of a structured questionnaire and observation. 100 questionnaires were issued to commuters to complete at Thokoza park station and all 100 were collected, added to this, a stopwatch was used to measure time frequencies between bus arrivals. Excel software was used to analyse the data collected into meaningful information. This research indicates that of the five service quality dimensions only two dimensions are totally satisfied namely empathy and tangibles. The other three dimensions namely assurance, reliability and responsiveness were partially satisfied. Therefore, Rea Vaya management should make attempts in improving the element of partially satisfied dimensions. More specifically, management needs to empower officials at the stations with authority to make decisions regarding commuter grievances, better scheduling methods to solve overcrowding during peak periods and information devices both busses and stations needs to be maintained and kept serviceable.

Currently Rea Vaya ridership has decreased from 35 000 commuters daily in 2010 to 16 000 commuters daily showing a decline in ridership overtime. This paints a picture that indicates that the commuters are not satisfied with the service provided by Rea Vaya resulting in using alternative transport modes. When the Rea Vaya managers fix the above-mentioned findings, it is expected that the ridership should gradually increase, perhaps to even above planned carrying capacity of 75 000 commuters daily.

Keywords

Service quality elements, Rea Vaya, Perception, Expectations, Satisfaction

1. Introduction

Public transport plays an important role in South African economy (Mitchell, 2014). The benefits of having an integrated public transportation system enhances mobility, reduces road congestion, decreases the carbon foot print caused by vehicle emissions (Chitauka, 2014) and contributes towards the growth of the economy (Walters, 2013). For this reason, it is important for a country to plan and implement public transport services properly (Walters, 2013). In the South African context transport planning importance is derived from the Constitution of the republic of South

Africa, the White Paper on National Transport Policy of 1996, the National Development Plan and the National Land Transport Act of 2009 (DoT, 2007). All these documents aim to provide mobility and access for people and goods, system performance and preservation (NLTA, 1996), environment and quality of life and finally to enable planning integration with other stakeholders (Walters, 2014).

For a public transport system such as Rea Vaya, provision for planning and implementations is made possible by the National Land Transport Act (NLTA) of 1996 under Integrated Rapid Public Transport Network (IRPTN) which mandates all metros in South Africa to plan and implement Bus Rapid Transit (BRT) systems to improve mobility and solve congestion issues that are currently prevalent in metropolitan areas (NLTA, 1996). The City of Johannesburg is such a city that is mandated to plan and implement a BRT system, which in this case Rea Vaya BRT system was planned and implemented successfully (Goondiwala, 2014).

The characteristic of a BRT system entails a modern bus service that has mass capacity to transport passengers timeously and at a reasonable cost (Cervero, 2013). BRT operation is a railway-like model which is coordinated centrally with its own dedicated route, right of way, own dedicated stations, trunk feeder systems and intelligent information systems (Nikitas & Karlsson, 2015 and Cervero, 2013)

Although the Rea Vaya was planned and implemented successfully, its planned carrying capacity was 75 000 commuters per day (CoJ, 2013), upon successful implementation in 2010, it had the carrying capacity of 35 000 commuters per day (JDA, 2012) in 2010 and currently the Rea Vaya is reported to have a daily carrying capacity of 16 000 commuters (Allen, 2013) in 2017. This pattern is a reverse of what can be expected from transport service such as Rea Vaya where over time it is expected for a BRT system to gain popularity and increase its daily carrying capacity closer to potential maximum carrying capacity.

Furthermore, HelloPeter an online platform which gives consumers an opportunity to either complain or compliment companies for their services was evaluated to better understand where this irregularity between the compliments and complaints may be originating from. The HelloPeter evaluation of Rea Vaya indicated that there were 123 reviews from January 2015 to 1 April 2017. From the 123 reviews that were evaluated 122 reviews were complaints. Most of the complaints were coming from trunk route 1 (T1) and T3 that connect Soweto and Johannesburg CBD and some of the feeder routes in Soweto as shown in Figure 1. The grievances that mostly stood out from the reviews were bus lateness, erroneous boarding card operations and poor customer services by staff (HelloPeter.com, 2017).

These complaints although derived from a small number of Rea Vaya commuters compared to the volume of commuters that are carried daily was alarming because it contradicted the concept and the purpose of a BRT system which is described by Rahim (2014) as a system that is designed to provide a world class public transport system that is efficient, safe, cheap and reliable.

Rea Vaya has long-term and short-term objectives as indicated by Goondiwala (2014). The long-term objectives include the provision of a safe, reliable and reasonably priced public transport system. The short-term objectives are frequent public transport, safe and secure system (Chitauka, 2014), accessible public transport to disabled people, decrease in congestion and enhancing urban environment (Allen, 2013). The success of Rea Vaya is therefore strongly dependent on the achievement of these objectives.

Rea Vaya's objectives correlates with Service Quality (SERVQUAL) elements in defining the measure of public transport service quality which are "(1) Tangibles, the appearance of physical facilities, equipment, personnel and communication material, (2) Reliability, the ability to perform the promised service dependably and accurately, (3) Responsiveness, the willingness to help the customers and providing prompt service, (4) Assurance is knowledge and courtesy of employees and their ability to convey trust and confidence and (5) Empathy", care and individualised attention is provided to the customer (Susniene, 2012, pp.105-06)

To further investigate and understand this irregular occurrence in Rea Vaya commuter volume trend over time, BRT system from different cities and continents were reviewed to understand their characteristics since implementation. The reviewed cities are Nigeria, Bangkok and Bogota. Firstly, Nigeria in a city called Lagos; has successfully implemented Lagos BRT in March 2008 (Adedayo, et al., 2014). Lagos BRT launched with a 22km corridor running North-South connecting the towns of Ketu and Lagos Island. The BRT has intermediary stations between the two outer towns (Adedayo, et al., 2014). Lagos BRT carries 180 000 commuters daily however its design does not incorporate the easy accessibility of its commuters, such as walkways and car parking facilities (Lagos Metropolitan Area Transport Authority, 2017). Lagos BRT is named the "Lite" unlike Rea Vaya, because it does not enjoy the privileges of right of way. Lagos BRT Lite operates in a mixed traffic environment (Cervero, 2013) and does not have formal feeder systems and is not integrated with other transport systems (Kumar, et al., 2011). Secondly, Bangkok is a city that has similar geographical, political and economic context as Johannesburg (Wu & Pojani, 2015). Bangkok implemented their BRT system in 2010 (Wu & Pojani, 2015). It moves less than 15 000 people daily even though its population density is 6 times that of Johannesburg (Wu & Pojani, 2015). Its BRT service qualities are superior to that

of Rea Vaya. Bangkok BRT system is said to have failed in a sense that 5 planned routes were cancelled (Wu & Pojani, 2015).

In their case study Wu and Pojani (2015) highlighted reasons that led to Bangkok BRT failure being a strong subway system, that currently exist and misalignment of stakeholder interests, lack of sustained political will to commit to the project's success. These factors are attributable to planning and implementation barriers and not service quality (Wu & Pojani, 2015).

Lastly in Bogotá, Colombia the BRT system was fully implemented in December 2000 (Nikitas & Karlsson, 2015). It transports 1.8 million passengers per day, utilising their exclusive 87 kilometers bus corridor network (Jenkins, 2012). The system possesses elements which include but are not limited to pedestrian and bicycle ways, peak hour automobile limitations using license plate restrictions, increased parking prices, and increased day-long automobile prohibition (Cervero, 2013).

As a result of excellent implementation and the system running well, it has been one of the most exceptional systems in the world (Cervero (2013), Hidalgo, et al., (2012) and Jenkins (2012). Bogotá BRT system owns its popularity based on their excellent implementation and planning and its continuous use by growing number of commuters is based on respectable service quality to its satisfied commuters (Sandoval & Hidalgo, 2012).

The three examples reviewed above indicate that a BRT system's success depends on two factors; the first being impediments of planning and implementation (Lindau, et al., 2014) and proper service delivery to commuters as measured by the SERVQUAL elements (Barabino, et al., 2012).

2. Literature Review.

1.1 Characteristics of a BRT system

Venter (2012), Cervero (2013), Allopi and Allen (2013) Rahim (2014), Ugo (2014), and Nikitas and Karlsson (2015), are authors that covered the characteristics of the BRT system. They indicate the minimum services that are required for a system to qualify as a BRT system. These minimum requirements are railway-like model which are coordinated centrally with their own dedicated route, right of way, own dedicated stations, trunk feeder systems, intelligent information systems, comfortability, are flexible and operate frequently. They agree that these characteristics are what make a BRT system unique from a legendary transport system.

Sandoval and Hidalgo (2012), Chitauka (2014), Rahim (2014) agree that the BRT system can be a solution to a city's mobility problem. Additionally, the expansion of BRT systems around the world is generally triggered by its low cost to implement, flexibility of its operation, prompt implementation, high performance and ease of access to various areas.

1.2 Rea Vaya BRT system characteristics and implementation

Havenga and Pienaar (2012), Walters (2013), Rahim (2014), and Goondiwala (2014) describe the Rea Vaya BRT system as a system that is designed to provide a world class public transport system that is efficient, safe, cheap and reliable. This is to solve the problem facing the current government, to provide safe, affordable and accessible public transportation against the growing population.

Sandoval and Hidalgo (2012), Tomaschek et al (2012), Adewani and Allopi (2013), Goondiwala (2014), Nikitas and Karlsson (2015) and describe the features and design qualities of Rea Vaya BRT system which are typical station consists of maps, automatic doors both sides of the station, elevator for wheelchair accessibility, security, CCTV, real time information display and information desk.

1.3 Objectives of Rea Vaya

Tomaschek et al. (2012), Goondiwala (2014), Chitauka (2014), (Center for Public Service Innovation (2014), Rea Vaya (2015) and Nikitas & Karlsson (2015) identify the long-term objectives of Rea Vaya and general BRT system objectives as the provision of a safe, reliable and reasonably priced public transport system.

Chitauka (2014) and Rea Vaya (2015) in addition to the long-term objectives identifies the following short-term objectives, frequent public transport, safe and secure system, accessible public transport to disabled people, decrease in congestion and enhancing urban environment.

1.4 Planning and Implementation Issues of Rea Vaya

Allen (2013), Walters (2013), Goondiwala (2014) and Chitauka (2014) points out the obstacles with identifying the main stakeholders that were going to be involved in project discussions and those who would be affected is important to implement a successful well support BRT system.

Havenga and Pienaar (2012), Walters (2013), and Center for Public Service Innovation (2014) state that transport system development has been relatively slow in South Africa (SA). Lack of funding for policy implementation, complex public participation process currently in place, lack of relevant skills from government officials to implement

policies, lack of integrated planning among three levels of government and other stakeholders led to the slow implementation.

Since Rea Vaya BRT system Phase 1 has been implemented successfully (Goondiwala, 2014) the focus of this research was to understand how far the project had progressed to function properly, this information was extracted from the customer's perspective where Rea Vaya customers were surveyed according to service quality elements.

1.5 Lessons learnt from other countries

Lessons from TransMilenio BRT system.

Kumar, et al. (2011), Sandoval & Hidalgo (2012), Jenkins (2012) and Nikitas and Karlsson (2015) in their writing describe the planning and implementation of the BRT system in Bogota, Colombia. The BRT system was initially implemented as an attempt to repair its transport problems. TransMilenio is a high quality and sustainable transport solution, which operates at a low cost. These authors further elaborated on other service offering that the system has implemented.

Lessons from Bangkok BRT system

Wu & Pojani (2015), Vikitset (2011), Lindau et al. (2014) described Bangkok as a city that has a population of 4million habitants. Despite the densely populated urban area, Bangkok failed to implement a successful BRT system at Satorn/Rajpruek route due to the following reasons; Bangkok has a strong culture of using train subways that over time become a mode of choice for many commuters.

Lessons from Lagos BRT System

Nikitas & Karlsson (2015), Rahim (2014), Rahim (2014) and Lindau et al. (2014) pointed out that the Nigerian BRT system also called Lagbus is a BRT Lite because it consists of limited components of a full BRT system such as infrastructure investment, integration with other modes and other service offerings. During the early stages of the planning process the community was consulted extensively and public participation was promoted adequately and this gave the community a sense of ownership (Lindau, et al., 2014).

1.6 Service Quality dimensions

Lau et al., (2013) and Harmes, (2012) states that of the 97 attributes that were found to have an impact on service quality in measuring customer's expectation and perception, were grouped into ten dimensions and these 10 dimensions were further refined into five dimensions in two stages, the first stage concluded with ten dimensions namely "communication, responsiveness, tangibles, reliability, credibility, security, competence, courtesy, understanding or customers and access" (Lau, et al., 2013, p. 4). The second stage focused on the scale dimensionality and reliability in which they were adjusted to five dimensions namely "tangibles, reliability, responsiveness, assurance, and empathy" (Lau, et al., 2013, p. 4).

Reliability

Susniene & Harmes (2012) and Matthew & Jugannathan (2015) describes Reliability on service quality as delivering what was promised, consistently. For instance, in a transport service provider this implies keeping the bus schedules as per timetable and convenience of the commuting hours. Harmes, (2012) further points out that reliability is one of the important dimensions in assessing perception on the quality of service being offered.

Tangibles:

Tangibles can be described as the appearance of physical facilities, equipment, personnel and communication material as indicated by Harmes (2012) and Lau, et al. (2013), in transport service provider tangibles will include variables such as how attractive is the busses, stations design, staff neatness in their uniform etc. (Matthew & Jugannathan, 2015)

Responsiveness

Responsiveness is the willingness to help the customers and providing prompt service as Harmes (2012), Lau, et al. (2013) and Matthew & Jugannathan (2015) points out. This dimension mainly focuses on speedily action and willingness to help customers with their queries, enquiries and clarification on service related matters. This may include the time that the customer must wait for feedback on their problems, answers to questions.

Assurance

Harmes (2012), Lau, et al. (2013) and Matthew & Jugannathan (2015) describe assurance as employees' knowledge and courtesy as well as their ability to convey trust and confidence. This is vital when customers perceive services as high risk or feel uncertain about their aptitude to evaluate outcomes. (Harmes, 2012).

Empathy

Susniene (2012) and Lau et al. (2013) explains that, empathy is the ability to give care and individualised attention to the customer. This is important as everyone is different and the company should be able to approach everyone's problem differently.

All the SERVQUAL elements were used to uncover how attractive Rea Vaya services were to its commuters. Barabino et al. (2012) argued that if the customer expected quality service is equal to or greater than the perceived service quality; the customers will be satisfied leading to customer loyalty and business growth. In addition to that Sulieman,(2015) also highlights that customer satisfaction is vital in a rapidly changing environment to maintain the available number of customers as well as attract new customers. This argument is also applicable for Rea Vaya, where it is expected that if their actual service quality exceeds the customer expected quality service then Rea Vaya should retain its customer loyalty.

3. Problem statement

The problem is that although Rea Vaya phase 1A - route T1 between Soweto and Ellis Park has been implemented successfully in Johannesburg (Goondiwala, 2014), Rea Vaya's maximum planned carrying capacity is 75 000 commuters daily (CoJ, 2013), the launching carrying capacity was 35 000 commuters daily in 2010 (JDA, 2017) but currently in 2017 Rea Vaya has a daily carrying capacity of 16 000 commuters per day (Rea Vaya, 2015). This trend indicates a decline of Rea Vaya commuters over time between 2010 and 2017. Furthermore, HelloPeter an online complaint platform was evaluated where 122 complaints were recorded since 2010, although the number of complaints were insignificant as compared to the commuters transported daily, majority of complaints were against the primary purpose of the BRT system that is described by Rahim (2014) as efficiency, reliability, affordability, timely and safe public transportation services

4. Main research question

To what extent is Rea Vaya delivering services to its commuters since implementation on route T1 that connects Soweto and Ellis Park as per their initial implementation plan?

4.1. Sub-questions

- How do existing Rea Vaya commuters perceive the service being offered by Rea Vaya on route T1 between Thokoza Park and Ellis park route?
- Which Rea Vaya's commuter expectations are currently being met by services offered by Rea Vaya in terms of service quality?
- To what extent do Rea Vaya's observed outcomes (bus frequency during peak and off peak) meet the published schedule?

5. Primary research objective

To evaluate the Rea Vaya's progress in meeting its commuters' needs since implementation on route T1 that connects Soweto and Ellispark.

5.1. Secondary research objectives

- To measure the extent to which commuters perceive the service being offered by commuters using route T1 between Thokoza Park and Ellis park route.
- To evaluate which Rea Vaya's commuter expectations were being satisfied by Rea Vaya services offerings.
- To measure whether Rea Vaya observable outcomes (bus frequency during peak and off peak) met the published schedule.

6. Research Methodology and Design

Quantitative data collection was used for this research paper in the form of structured questionnaire and structured observation. Quantitative data collection can be regarded as a deductive approach which focuses on utilising data to test the theory (Walker, 2014). According to Saunders, et al., (2016) this method observes the relationships between variables. The independent variables of this research were the five SERVQUAL elements and the dependent variables were the satisfaction levels of the commuters.

Experimental design was used where all commuters using route T1, connecting Soweto and Ellis Park, were given a questionnaire to answer and two stations used to collect data through observation. This method enables generalization because it uses probability sampling technique. All Rea Vaya commuters from Thokoza Park to Ellis Park bus stations were used to collect data.

Probability sampling (Representative sampling) was used for the commuters at the two stations and a Rater system (the satisfaction of the five SERVQUAL elements) was used to measure other dimensions such as the frequency of buses during peak and off-peak hours. For the sampling strategy, a simple random sampling was used where 100 random commuters were asked to answer questions from the questionnaires.

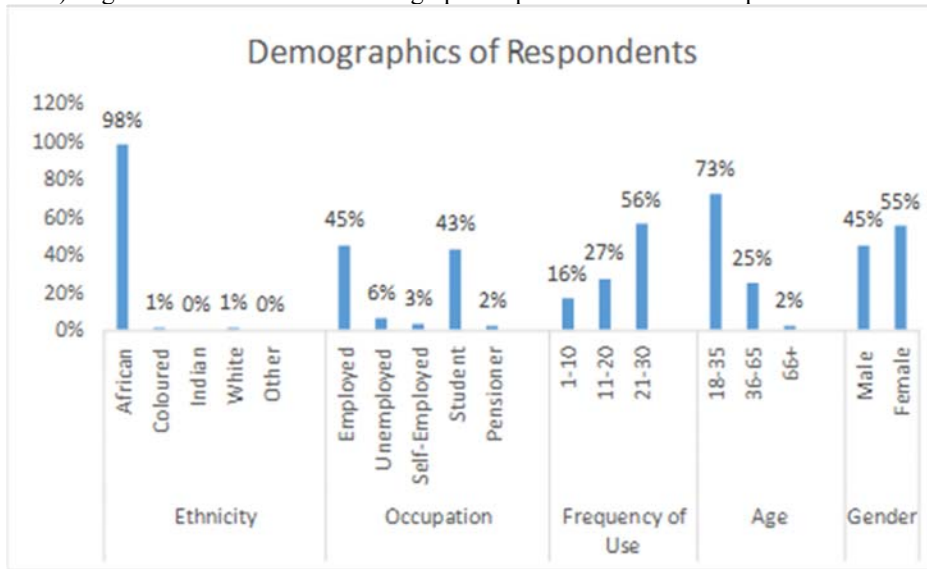
Cronbach's alpha tool was used to test internal consistency of items in a scale to determine the reliability of data items. Cronbach's alpha reliability coefficient ranges between 0 and 1. (Vaske & Beaman, 2016). Cronbach coefficient above 0.8 is considered reliable to make decisions about individuals based on their responses (Webb, et

al., 2016). Data collected from Rea Vaya’s commuters scored Cronbach’s alpha coefficient of 0.86. Therefore, the data collected at Thokoza-Park shows an internal consistency of items and can be used to draw conclusions based on the sample size.

7. Results and analysis

7.1. Demographics Profile Respondents

At Thokoza-park station 100 questionnaires were handed out and all 100 were collected from the respondents. Data was collected between 07:00-09:00am, this time frame falls within the prescribed morning peak period (SANRAL, 2015). Figure 1 below shows the demographic representation of the respondents.



Demographic of Respondents: Figure 1

In South Africa Rea Vaya BRT is used to connect previously disconnected communities to Johannesburg CBD (Parrock, 2015), where the economic activity takes place (Statssa, 2015). Figure 1 indicates that 98% of the ethnic group that responded to the questionnaire was African, this does not come as a surprise as Soweto township is populated by African people (Brown, 2016), whom were located on the outskirts of Johannesburg as an effort to economically exclude them from the city’s economic activity, this directive was the apartheid government policy (Walters, 2013).

From the sample size, 45% of the respondents are employed and 43% are students. This indicates that during peak hours Rea Vaya is mostly used by students commuting to surrounding universities in Soweto and Johannesburg as well as workers commuting to Johannesburg CBD for their employment.

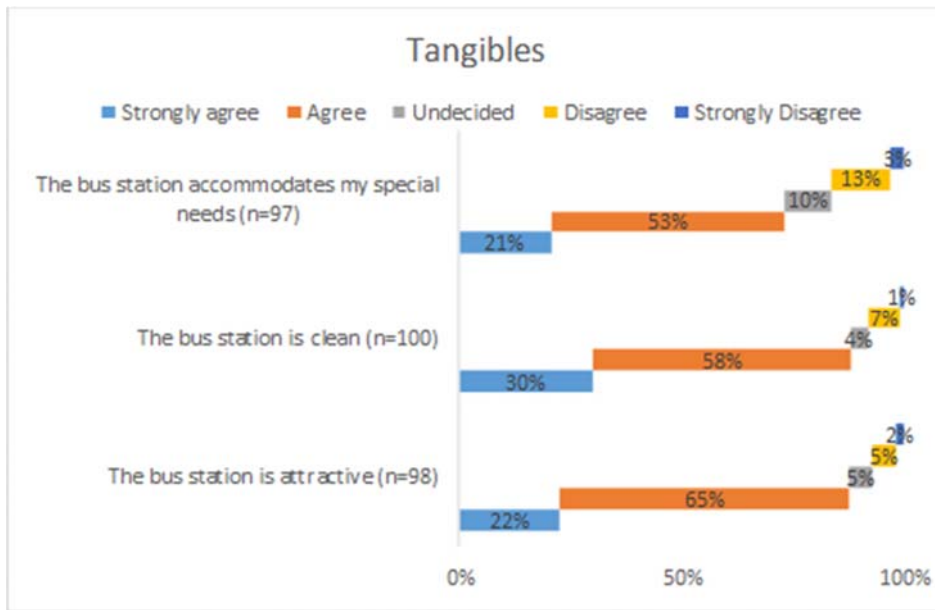
More than half (56%) of respondents use Rea Vaya, between 21-30 days in a month (30 days). This information indicates that majority of users during peak are frequent users, 73% of respondents falls within the youth age category (18-35) and majority (55%) are female.

7.2. Objective 1: Commuters perception on the services being offered by Rea Vaya on route T1 between Thokoza Park and Ellis Park

The findings below are based on questions that the commuters responded to, the questions were designed to form elements of service quality dimensions when combined. The letter (n) inside the brackets on each question indicates responses from the total of 100 questionnaires.

Tangibles

Tangibles measure the perception of respondents based on the appearance of physical facilities, equipment, personnel and communication material (Susniene, 2012). Figure 2 below depicts the three questions that were used to measure tangibles.



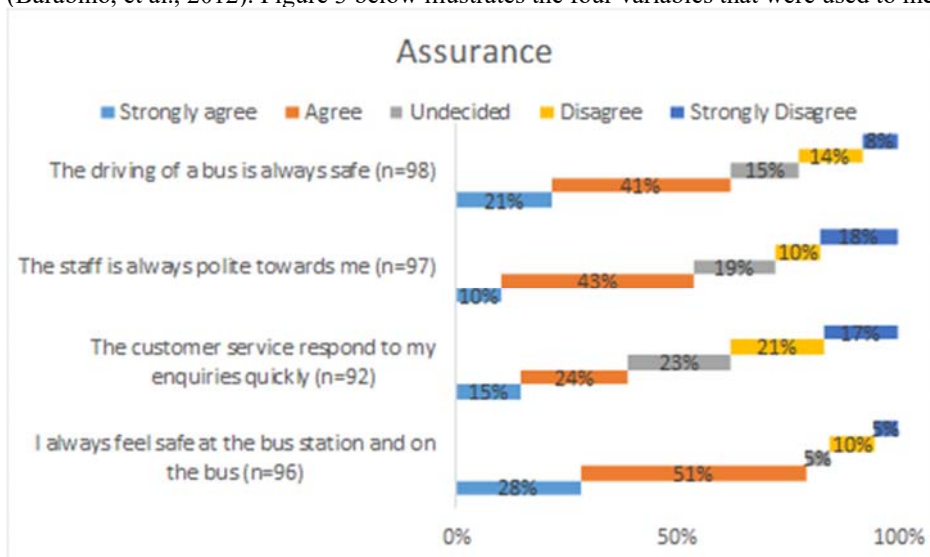
Service Quality Tangibles: Figure 2

Figure 2 indicates that 53% agrees & 21% strongly agrees that the bus station accommodates their special needs, 58% agrees & 30% strongly agrees that the bus station is clean and 65% agrees 22% strongly agrees that the bus station is attractive.

It can be concluded that the commuter’s perception of Rea Vaya’s tangibles is positive, therefore, Rea Vaya’s stations, busses, personnel etc. appearance is attractive as experienced by Rea Vaya customers.

Assurance

Assurance is described as the knowledge and courtesy of employees and their ability to convey trust and confidence (Barabino, et al., 2012). Figure 3 below illustrates the four variables that were used to measure the assurance.



Service Quality Assurance: Figure 3

Figure 4 indicates that, 51% agree & 28% strongly agree that they “always feel safe at the bus stations and on the bus”. When asked if “the customer service responds to my enquiries quickly”, 24% agree & 15% strongly agrees, 21% disagree & 17% strongly disagrees, whilst 23% is undecided. When the question “the staff is always polite towards me”, 43% agrees & 10% strongly agrees and finally when the commuters where asked “the driving of the bus is always safe” 41% agree & 21% strongly agree.

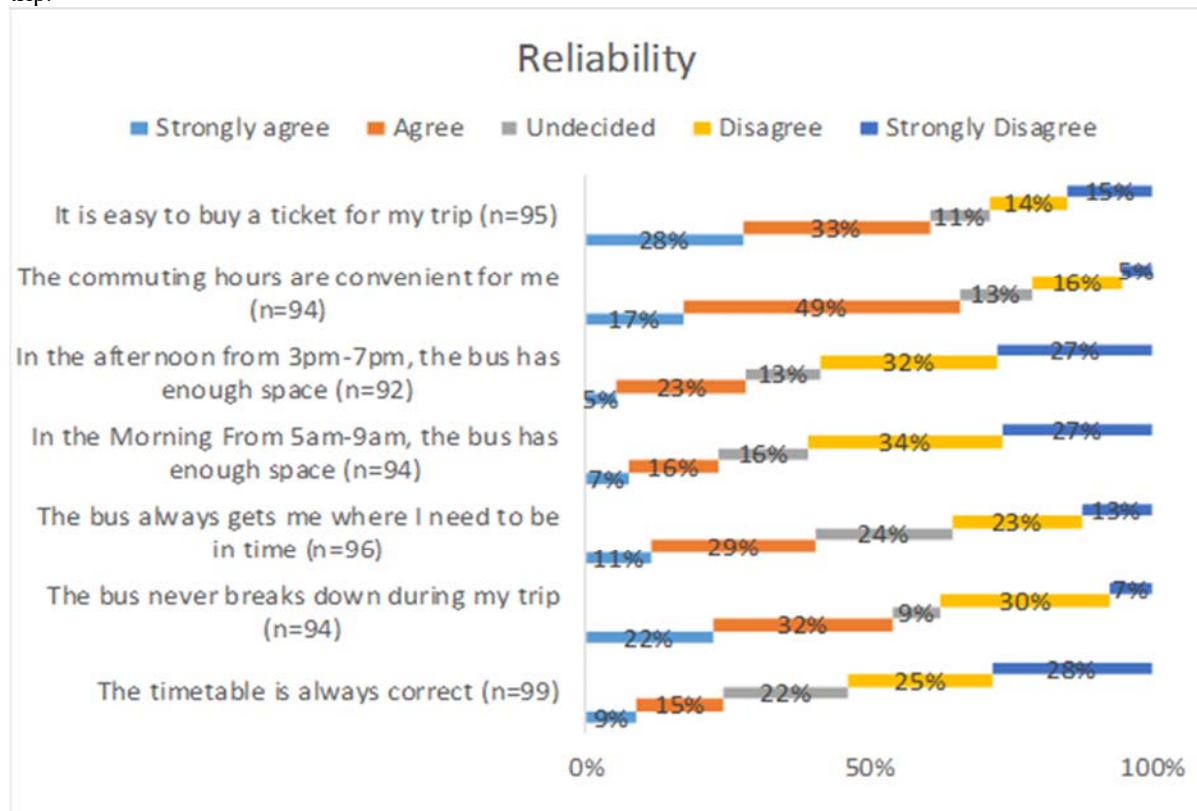
Of the four variables being tested, two is measuring safety and the response to both safety aspect where perceived positively by Rea Vaya’s commuters, indicating that Rea Vaya’s can provide a trustworthy relationship to its customers whilst being courteous. However there seems to be uncertainty with customer service response. This variable indicates a scattered opinion about Rea Vaya’s staff ability to respond speedily to customer queries and questions which raises a question if they are adequately equipped to deal with customer concerns in their level or is every concern forwarded to the next level of authority, which potentially can take longer before a customer gets assistance that they seek.

During data collection, it was also noticed that commuters mostly forward their enquiries towards the security guards instead of relevant information window situated at the station, this may also be the reason why the responses are indecisive, as the security guards are not suitably qualified to deal with customer enquiries.

Safety is of paramount importance (Ceylan & Ozcelik, 2016), because it conveys trust and confidence to commuters (Barabino, et al., 2012), that will ultimately result in continued usage of the Rea Vaya BRT. It can be concluded that the commuters perceive Rea Vaya’s service quality assurance dimension is perceived positively, therefore majority of commuters perceive Rea Vaya’s employees as courteous and could convey trust and confidence to the customers

Reliability

Reliability is the ability to perform the promised service dependently and accurately (Susniene, 2012). Figure 4 below indicates the variables that were used to measure reliability. These variables can be summarised from top to bottom as, accessibility, overcrowding during peak periods, reliance of service and availability of relevant information for the trip.



Service Quality Reliability: Figure 5

The first two set questions deal with testing the accessibility variable of Rea Vaya. When commuters were asked a question “it is easy to buy a ticket for my trip”, 33% agreed & 28% strongly agreed and when asked if “the commuting hours are convenient for me”, 49% agrees and 17% strongly agrees. This set of questions indicated that Rea Vaya commuters perceive, Rea Vaya’s accessibility positively.

The second two set questions deal with overcrowding inside the buses during the morning (5am-9am) and afternoon (3pm-7pm) peak. When the commuters were asked “In the afternoon from 3pm-7pm, the bus has enough space”, 32% disagreed & 27% strongly disagreed, and when asked about the morning peak, 34% disagreed and 27% strongly disagreed that “in the morning from 5am-9am, the bus has enough space”. This set of questions indicated that commuters perceive the busses as overcrowded during peak periods.

The next two set of questions deal with the ability of commuters to rely on Rea Vaya, where 29% agrees & 11% strongly agrees that “the bus always gets me where I need to be in time”, whilst, 32% agrees & 22% strongly agrees that “the bus never breaks down during my trip”. Majority of commuters perceives Rea Vaya’s as service provider that can be relied on.

The last question tests the availability of relevant information for a trip or published bus frequency that is displayed on the bus station and the bus its self, indicating information about when is the next bus coming or when in the bus what is the next station. In this test, 25% disagrees & 28% strongly disagrees that “the table is always correct”. This test indicates that the commuters perceive availability of trip information negatively.

Although the busses are overcrowded during peak periods and head-up information display on the station and busses could be malfunctioning most of the times, the commuters have confidence on Rea Vaya as a service provider that can be trusted to provide an accessible transport service that is reliable, therefore the commuters perceive Rea Vaya as a service provider that can provide it service dependently although not accurately

Responsiveness

Responsiveness is the willingness to help the customers and providing prompt service to the customers by an organisation when it is required (Barabino, et al., 2012). Figure 6 below illustrates the two variables that were used to measure responsiveness.

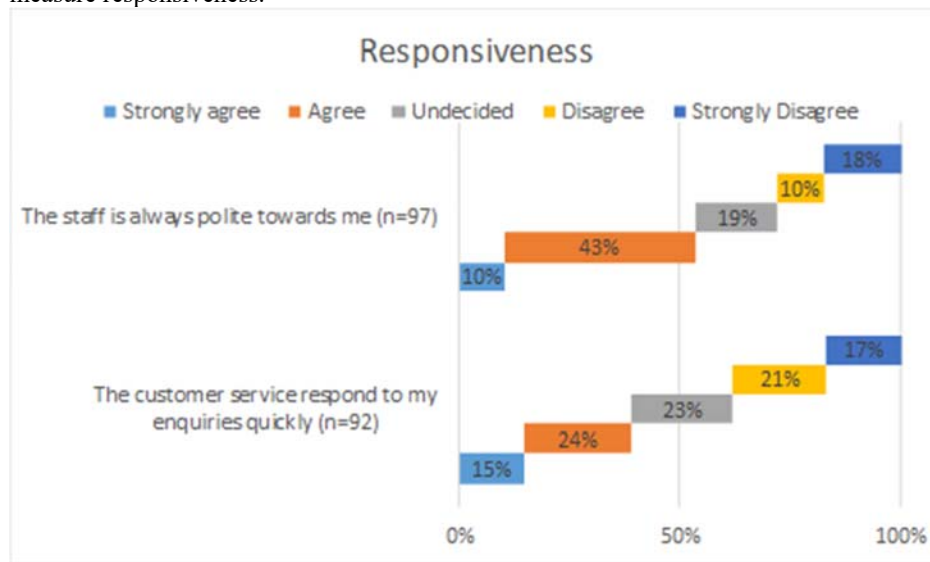


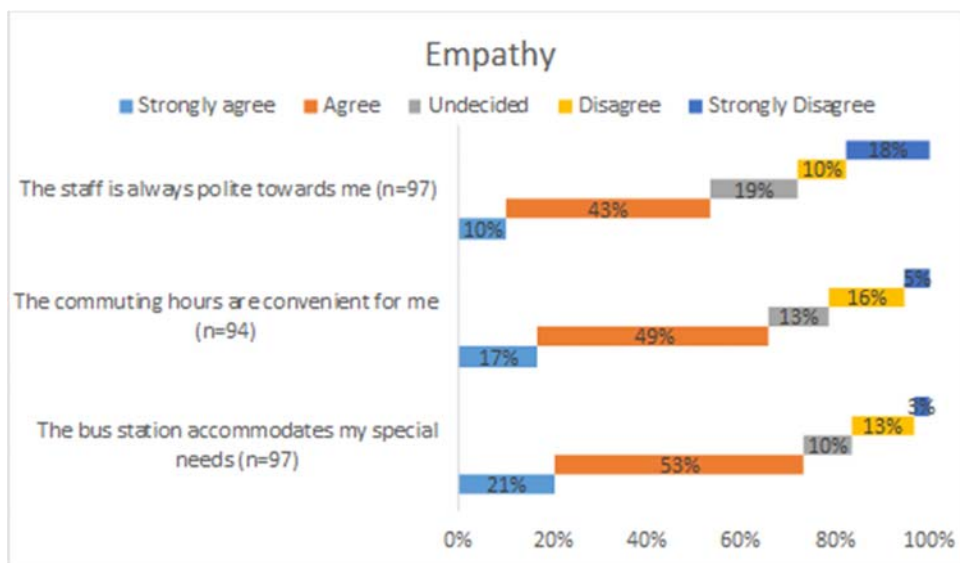
Figure 5: Service Quality Responsiveness

In Figure 5, 43% agrees & 10% strongly agree that “the staff is always polite towards me” and when asked that “the customer service responds to my enquiries quickly”, 24% agree & 15% strongly agrees, 21% disagree & 17% strongly disagrees and 23% is undecided.

The commuters seem not to be convinced if the officials based at the station can adequately and speedily resolve issues at the stations. This may be a result of officials not adequately trained to deal with customer concerns or perhaps they are not empowered to make decisions at that level. It can be concluded that although Rea Vaya officials at the stations are courteous, however the commuters are not sure if the officials can resolve their concerns satisfactorily.

Empathy

Empathy is the ability of the organisation employees to give its customers care and individualised attention to its customers when they have service concerns (Susniene, 2012). Figure 6 below illustrates the three variables that were used to measure empathy.



Empathy Service Quality: Figure 6

Figure 6 indicates that 43% agrees & 10% strongly agrees that “the staff is always polite towards me. The second variable tested response of Rea Vaya employees towards customer enquiries and 49% agrees & 17% strongly agree that “the commuting hours are convenient for me”, and 53% agrees & 21% strongly agree that “the bus station accommodates my special needs. These results suggest that the commuters perceive Rea Vaya’s service quality empathy positively.

It can therefore be concluded that Rea Vaya takes necessary efforts to care for its customer needs and when there is service concerns the officials at the stations will treat each case with the necessary individualised attention it deserves.

7.3. Objective 2: Commuters expectations that are currently satisfied by Rea Vaya services

The perception of the commuters refers to the actual service which they experience from using the Rea Vaya (Mcwabe & Phiri , 2013) and the expectations of the commuters are those services which they hope to receive (Dabholkar, 2014). The commuter’s expectations that are currently being satisfied by Rea Vaya will be those that are currently being perceived positively. The discussion that follows below is based identifying service quality dimensions that Rea Vaya is doing is meeting the customer expectations.

Tangibles

Figure 2 above illustrates the three questions that made were used to measure tangibles and It was deduced that the commuter’s perception of Rea Vaya’s tangibles were positive. Therefore, it can be concluded that Rea Vaya tangibles dimensions meet the commuter’s expectations therefore Rea Vaya’s physical facilities, equipment, personnel and communication material meet customers’ expectations.

Assurance

Figure 3 above illustrates the four questions used to measure assurance, it was concluded that the commuters perceived Rea Vaya’s assurance element positively, although they were not satisfied with the official’s ability to solve issues at the station speedily therefore Rea Vaya’s satisfied the commuters expectations by being courteous and by having the ability to convey trust and confidence towards their customers.

Additionally, it is deemed that safety is positively highlighted because before Rea Vaya’s implementation, commuters had to make use of the mini-bus type taxi services, which was described by Walters (2013) as informal services that was troubled by internal conflicts among different taxi associations. As a result safety standards were dwindling in the industry.

Reliability

Figure 4 above illustrates the seven questions that were used to measure reliability. It was concluded that the commuters have confidence on Rea Vaya as a service provider that can be trusted to provide an accessible transport service that is reliable, therefore Rea Vaya partially meet the customers’ expectations as the busses are overcrowded during peak periods and the head-up display does not indicate the frequency of busses and whilst in the bus the next station information is not displayed.

Out of all the seven questions which have been discussed, only two of the seven questions had more than 50% of the respondents who agreed and strongly agreed. The responses have shown that even though Rea Vaya is reliable and

can be counted on and that the commuters are satisfied with some of the services they're receiving, there is still a lot more that can be done to improve the reliability.

Responsiveness

Figure 5 above illustrates the two questions that were used to measure responsiveness and it was concluded that although Rea Vaya officials at the stations are courteous, however the commuters are not sure if the officials can resolve their concerns satisfactorily, therefore Rea Vaya is meeting customer expectations on responsiveness although it takes longer as the officials at the station seems not sufficiently equipped to make decisive decisions in helping commuters that have service issues or complaints. There is still room to improve responsiveness dimension by Rea Vaya management and bus stop officials.

Empathy

Figure 6 indicates the questions that were used to measure the empathy service quality element and it was concluded that Rea Vaya takes necessary efforts to care for its customer needs and when there is service concerns the officials at the stations will treat each case with the necessary individualised attention it deserves, therefore Rea Vaya has meet customer expectations fully with regards to empathy service quality dimension. To give an example Rea Vaya did good in this regard because people with special needs such as those that use wheel chairs are catered for, which was feature that was not available previously in mini-bus taxi services.

The above findings reinforce the argument made by Barabino, et al. (2012) that when the expectations of a customer are being met, the customers will be greatly satisfied. The findings have also shown that the Rea Vaya objectives as identified by Goondiwala (2014) to provide a safe and reliable public transport system have been met.

7.4. Objective 3 Measurement of Rea Vaya observable outcomes versus published outcomes.

This objective is based on observable outcomes at Rea Vaya bus station in Thokoza park. These objective aims to measure Rea Vaya's actual bus frequency during the morning peak and off peak. SANRAL (2015) describe the morning peak period to lasts for three and a half hours between 05:00-08:30am and the afternoon peak starts at 03:30-07:00pm. As a result, these observations were carried out between 07:00-08:30am using a stopwatch during morning peak and off-peak. Table 1 indicates the random three-time trials that where obtained during peak and off-peak.

Table 1: Observed time trials at Thokoza park between 07:00-09:00am (peak-period) and 09:00-12am (off-peak period)

Table 1: Rea Vaya Frequency Time Trials in Minutes

	Time-Trial 1	Time- Trial 2	Time- Trial 3	Average Mean Time
Morning Peak (05:00-08:30)	12	15	18	15
Off Peak (09:01-12:00)	30	20	18	23

Table 1 indicates the three time-trials that were obtained at Thokoza park station using a stopwatch to measure bus frequency between busses in minutes. As shown in table one the three-time trials obtained during peak and off-peak where averaged using mean method of averaging. This method is used to determine a more centrally located time in minutes. Table 1 further indicates that the average mean time during peak is 15 minutes and off-peak is 23 minutes. Rea Vaya (2015) has however published that the planned time frequencies during peak is 5 minutes and 15 minutes off-peak. Therefore, during peak the frequency of busses is offset by 10 minutes and off-peak by 8 minutes. This difference between published planned times and actual time frequencies may be an indication of a deeper lying inefficiency or inability to scheduling.

An alternative argument posed by Gauteng Provincial Government (2014) is that there are too many private vehicles in Gauteng roads added to this dilemma minibus taxi operators are also competing with Rea Vaya. Walter (2013) indicates that minibus services upon implementation of BRT system are supposed to be absorbed by the BRT system as the sole operators, thus easing the road congestion, as per the provision made by the National Land Transport Act of 2009, however this is not the case (Walters, 2013)

8. Discussion of the study

8.1. Objective 1: Commuters perception on the services being offered by Rea Vaya on route T1 between Thokoza Park and Ellis Park

Taking all the service quality dimension into account it can be shown that not all are perceived positively. Only two dimensions; tangibles and empathy are being meet completely according to the survey results. All the dimensions are individually discussed below.

Service quality tangibles was concluded by stating that Rea Vaya commuters perceive them positively. All the variables that were used to measure tangibles scored positively as shown by figure 3. These results indicated that a

Rea Vaya has differentiated its self very well from other transportation systems, these results also seem to support a claim made by Nikitas and Karisson (2015) that a BRT system needs to be branded uniquely and easily identifiable from other conventional transport service providers and portraying a professional brand image.

Figure 4, service quality assurance indicated that Rea Vaya was perceived positively, therefore it enjoys a trustworthy relationship among its customers whilst being courteous. However, there is room for improvement to empower its officials working at the bus stations. This can be done by delegating authority to the lowest decision-making level within Rea Vaya's organisational structures as suggested by Wensveen (2015). This strategy will allow minor decision to be made at the operating level and complex decision to be made at higher levels.

It was also shown that Rea Vaya as a transport service provider can provide a transportation service dependently although not accurately. This dimension was covered by findings on figure 5, service quality reliability. The accuracy challenge is caused by erroneous overhead bus frequency time table at the stations and nonfunctioning information display screens on the bus. Non-availability of this information makes it difficult for non-frequent commuters to know which bus is next or which station is next. As a result, this may discourage commuters that have other alternatives to converting to public transport. Adewani & Allopi (2013) indicate that for a BRT to remain relevant and attractive to its customers, the organisation managing such a system must develop a comprehensive maintenance plan. Besides overcrowding during peak periods accuracy can be improved by designing a scheduling criterion that will encompass commuter volume flows during peak periods (Wensveen, 2015).

Rea Vaya officials at the bus stations are courteous, but it seems that they are unable to resolve customer concerns promptly at the bus stations. This issue was highlighted by service quality responsiveness, shown by figure 6. This issue as suggested by Wensveen (2015), can be solved by empowering officials at the stations to have authority to solve customer issues as they arise. If this suggestion is neglected, the customer concerns will take longer due to lengthy reporting channels. Another method that can be followed as suggested by Carpenter & Sanders (2014) is to install a telephone lines or other communication channels at the station that will enable commuters to directly speak with officials that have the capacity to resolve their issues.

The last service quality dimension was empathy, this dimension was also satisfied completely, suggesting that commuters perceive Rea Vaya as an organisation that can give its customers care and individualised attention.

While Rea Vaya enjoys a positive outlook in Soweto, it must however be taken into consideration that Soweto community is still generally a poor area (Brown, 2016), and before Rea Vaya BRT was implemented, commuters from Soweto travelling to Johannesburg and other surrounding areas had to use mini-bus taxis, which have safety concerns that leads to road accidents, the government has since implemented the Taxi Recapitalisation project since 2009 to improve safety and formalise the industry (Walters, 2013).

8.2. Research Objective 2: To evaluate which Rea Vaya's commuter expectations were being satisfied by Rea Vaya services offerings.

Results have indicated that only the expectation categorised under tangibles and empathy service quality elements are satisfied. Whereas the expectation categorised under assurance, responsiveness and reliability service quality elements are satisfied but there are areas that needs improvement.

According to the results on figure 3, there was an indication that the commuters' expectations on the tangibles were satisfied. It can therefore be implied that commuters' desire to have a transportation system that is clean, have professional officials and attractive busses and stations is being satisfied.

The results from figure 4, service quality assurance showed that although the commuters are not able to respond promptly to their issues, Rea Vaya satisfies commuters expectations in terms of being courteous and having the ability to convey trust and confidence to the commuters. The safety is mostly highlighted because before the Rea Vaya was implemented, commuters had to make use of the mini-bus taxi's that the Department of transport has tried to formalise through a R17.7 billion taxi recapitalization project since 1999 (Walters, 2013).

Figure 5 above has indicated that commuters have confidence on Rea Vaya as a service provider that can be trusted to provide an accessible transport service. Although this aspect of reliability has satisfied commuter expectations, management still has a task to find ways to solve the issue of overcrowding and non-functioning information system. A reliable transport is imperative in ensuring that they keep ridership consistent. The commuters had expectations of a service which makes using public transport easier which it has yet only to a certain level.

In figure 6, service quality responsiveness was discussed and concluded that there were indications that the commuters were not happy with the promptness of resolving by the bus station officials. Although this concerning the figure indicated that staff was always courteous. These expectations can be met by ensuring that there are dedicated knowledgeable staff put in place at the stations with clear signs who the commuters should refer their enquiries to.

The commuters' expectations were satisfied with the questions which were categorised under the empathy element. Figure 7 indicated that the commuters' expectations are met on all the questions.

It is important for an organisations such as Rea Vaya to understand the importance of satisfying customer expectations. Barabino, et al. (2012) argues that if an organisation is providing an expected service quality that is less than perceived quality, this will lead to customer dissatisfaction. Ultimately dissatisfied customers do not want to associate themselves with an organisational product. This may be an indication that suggest that perhaps the reasons why Rea Vaya is not increasing rider-ship over time could be dissatisfied commuters with the level of service being provided

8.3. Research Objective 3: To measure whether Rea Vaya observable outcomes (bus frequency during peak and off peak) met the published schedule.

Table 1 indicated that, busses are not running as per the times that Rea Vaya (2015) has published on their websites both during peak and off-peak. This difference between published planned time and actual time frequencies may be an indication of application of inefficient scheduling techniques. Perhaps another reason could be that the scheduling managers have not accurately diagnosed operational limitations, such as which routes requires more busses during peak or which routes can needs trunk-busses. Jacobs & Chase (2014) suggest that these factors along with crew availability should be considered to implement a scheduling that meets that organisation intended goals.

An alternative argument posed by Gauteng Provincial Government (2014) is that there are too many private vehicles in Gauteng roads. In the morning there is traffic originating from the outskirts of the CBD into the CBD which creates congestions on the roads. Further congestions is also increased by minibus taxi operators competing with Rea Vaya. Walter (2013) indicates that a BRT system such as Rea Vaya is supposed to absorb previous operators of a route not compete with them. This is a provision made by the National Land Transport Act of 2009 (Walters, 2013).

During a trip to Thokoza station it was also observed that in Soweto residential area roads, Rea Vaya does not have dedicated High Occupancy Vehicle (HOV) lanes. This means that Rea Vaya could experience traffic jams due to congestion during peak periods. Allen (2013) argues that a BRT system should be supported by strong law enforcement department. This statement is important because, failure of Gauteng Government to resolve the mini-bus operators competing with Rea Vaya is eroding the real benefits of the System and potentially will undermine its full potential due to, factors such as road congestion and inability of Rea Vaya to deliver its promises.

9. Conclusion and Recommendations

Only two out of five service quality dimensions are totally perceived positively which are tangibles and empathy. The other three service quality dimensions have areas that requires intervention by Rea Vaya's management team to improve on. However, it was demonstrated that Rea Vaya commuters perceive the service quality being provided positively.

Therefore, it can be concluded that Rea Vaya commuters perceive the service being offered by Rea Vaya on route T1 between Thokoza Park and Ellis park route positively. However, management must take necessary steps to equip their officials based at station to solve customer issues quickly. Furthermore, Rea Vaya's bus schedulers must also take necessary steps to resolve overcrowding in busses during peak periods. Lastly, the maintenance department must also improve servicing of the overhead information systems at stations and on busses.

Although the positive response can only be identified on two of the five elements, there is still a chance to better manage and improve how the other three elements are being met. The above findings echo the argument made by Barabino, et al., 2012 that when the expectations are being met, the customers will be greatly satisfied. The findings have also shown that the Rea Vaya objectives as identified by Goondiwala (2014) to provide a safe and reliable public transport system have been met. This positive response can be tied to the fact that Rea Vaya BRT system is the first of its kind in South Africa (Adewani & Allopi, 2013), as a result has revolutionaries how public transport is viewed and experienced moving forward.

It can be conclusion that Rea Vaya can meet the following customer expectations; a strongly branded transport system that can has differentiated operating strategy, ability to convey trust and confidence to its customers courteously, to provide accessible transport service that is dependable and caters for commuter travel demands indiscriminately.

Rea Vaya observable outcomes does not met the published schedule. Rea Vaya in 2015 published in their website that during peak periods there will be a bus on route T1 every 5 minutes however in reality the bus arrives in every 15 minutes, in average. During off-peak Rea Vaya has promised its commuters to provide a bus every 15 minutes whilst in reality a bus arrives in every 23 minutes, in average.

Consequently, Rea Vaya's observable outcomes such as the bus frequency during peak and off-peak periods does not meet the published schedule. Rea Vaya scheduling department should consider building more robust scheduling methods into their planning to overcome bus delays.

This research paper has few limitations that must be considered, firstly the sample size is too small to make conclusion about the BRT system holistically, secondly the data was collected at a community that is recovering economically and had few public transportations alternatives before Rea Vaya. This limitation may skew the findings favorably whilst else, in a developed community the service level being provided, will be regarded as unacceptable. Lastly to

understanding how the system is performing holistically, sampling must be done to all communities where Rea Vaya is operating.

It is the finding of this paper that since implementation, Rea Vaya's service quality on route T1 that connects Soweto and Ellispark is deemed satisfactorily by commuters. It is therefore recommended that Rea Vaya management should address issues pertaining to empowering their station officials with authority to solve issues or improve their customer service training, adopt more efficient scheduling methods to mitigate overcrowding and improve bus frequency especially during peak periods and finally update their information system to improve customer experience.

If these issues can be solved Rea Vaya should be able to attract, and convert private car operators into the public transport service, hence enjoy a steadily increasing usage rate over time

Future research that could be conducted is comparison between customer experiences in different communities in Johannesburg that Rea Vaya is currently covering. This research will give a holistic view of the real progress and systems performance holistically

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