HARNESSING CHOICE USERS TO USE PUBLIC TRANSPORT IN SOUTH AFRICA

L VAN WYK[1]* and P ONDERWATER[1]**

[1]Hatch Africa, 58 Emerald Parkway Road, Greenstone Hill, Johannesburg 1609;
*Tel: 073 7617419; Email: luke.vanwyk@hatch.com
**Tel: 073 0418294; Email: pieter.onderwater@hatch.com

ABSTRACT

Many Choice Users (users who have the option to choose between private car and public transport) are quite happy using modern public transport (PT) systems like Gautrain and MyCiti in South Africa, but they seem reluctant using Metrorail, buses, and minibus-taxis. Some of them would consider those 'traditional' PT systems, "if only…". The authors have explored – using a survey amongst Choice Users – what would be some of the minimum requirements / conditions for Choice Users to start considering using PT for some of their trips.

Apart from long-term measures as new and faster routes, some improvements can be found by providing an assurance (insofar possible) of safety and security; information on routes, stops, times, and chances of being seated. This is to counter some of the preconceived misperceptions many of the Choice Users have on 'traditional' PT. If this information is provided, a first barrier to use PT is gone, and some Choice Users would be willing to give it a try.

Operators (PRASA, bus companies, Taxi Associations, etc) and Transport Authorities could start providing this information of their service, to attract more passengers, and come to a slow shift in transport mode use, reduce the reliance on car traffic, and reduce the impact on climate change by transport. In addition, as a very quick win, employers can start giving such information for their staff, supported by staff that consider themselves 'PT-Ambassadors'.

1. INTRODUCTION

1.1 Background

Public transport (PT) is a sustainable mode of transport and is being actively promoted worldwide since it helps alleviating congestion and is less harmful for the environment. Recently in South Africa, several new systems such as Gautrain (rapid rail) or new Bus Rapid Transit (BRT) services such as MyCiTi or Rea Vaya are not only used by the traditional Captive PT users, but seemingly also attract many Choice Users (or rather 'Car Captives'). However, these Choice Users would hardly consider using the 'traditional' PT services such as Metrorail trains, conventional buses (Golden Arrow, Putco, etc.), or minibus-taxi. This paper delves into the requirements for Choice Users to use traditional PT systems and not only the new modes such as Gautrain or BRT.

This is particularly pertinent since of the 35% of people that use PT to work nationally, 80% of these trips are by minibus-taxis, the remainder by Metrorail and buses, leaving a low percentage of people using the previously discussed new modes (Stats SA, 2021).

These new modes cover significantly less of the network compared to mini-bus taxis. Therefore, in order to attempt to boost PT use, traditional modes (such as minibus-taxis) need to be explored. These findings can be used by employers, fellow commuters, and transport operators to shift more Car Captives to public transport.

1.2 Objective of this Paper

This paper aims to identify and analyse the reasons why car captives are not using public transport and focussing on what it would take for car captives to use PT. For that reason, we surveyed current commuting patterns of employees of one company in South Africa, specifically whether they use PT; and why not. In section 2, the current use of public transport in South Africa is presented, with a discussion on general quality aspects required of PT services.

The authors have set up a survey, presented in section 3, interrogating the hinderances that stop people from using PT to the office or for other trips. From the findings, discussed in section 4, it is identified what could be done to promote using PT as a mode of transport to work or other destinations, with recommendation in section 5, split into short-, medium-, and long-term implementations.

2. QUALITY ASPECTS FOR PUBLIC TRANSPORT

2.1 Public Transport in South Africa

The National Household Travel Survey (NHTS) 2020 (Stats SA, 2021), conducted just before the Covid Lockdown hence a 'normal' situation, provides some data on the use of public transport (PT). Currently, the three main modes of transport (walking, PT, and private car) each have roughly 1/3 of the modal share of all trips. For commuting to work, the share by car is somewhat higher; for education trips, walking is much higher. Also, in urban areas, the share of car use is higher; in rural areas, the share of walking is much higher. But in all instances, the use of PT is fairly similar.

The use of Gautrain would be too small to be recognised in the train share of the survey. Gautrain serves less than 1% of all PT trips in Gauteng, which equates to less than a quarter % of all PT trips in South Africa.

Considering the income distribution, the lowest quintile (20% of the population) and the highest quintile (20%) make less use of PT for work purposes than the medium-low and middle-income groups: the lowest-income group as they hardly travel to work or use employer's provided transport; the latter group as they generally own and use a private car.

2.2 Quality Aspects

The NHTS 2020 has also surveyed the percentage of people that are dissatisfied about certain quality aspects. Although this is a subjective valuation, it gives a good indication of the perceived quality of different PT modes by its current users.

The main factor that influences the household choice of transport mode is the cost of transport at 31%. However, considering the statistics, the money aspect would not play a role for car users as driving the private car for commute purposes is 3 times more expensive than using PT (Stats SA, 2021). Other aspects to consider include travel time

at 23% and flexibility and reliability at 23% combined. Interestingly, safety and security does not play a big role in the mode choice (5%) according to Stats SA (Stats SA, 2021). However, in our survey results, we will see that safety and security is the main reason why non-PT users are not using PT.

The general dissatisfaction with the train service overall is 69% (worsened since previous NHTS surveys). This is much worse than the valuation of bus service with an overall dissatisfaction at 23% (improved over the years) and minibus-taxi service at 30% (also improved); see Figure 1 (Onderwater, 2022).

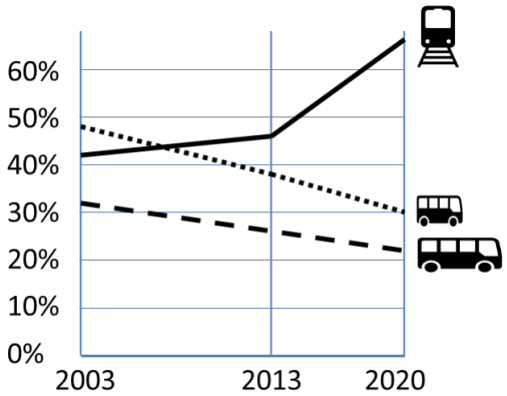

Figure 1: Dissatisfaction with PT Modes

2.2.1 Train Service

The main reason for people not using the train as mode of transport was because the train was not available; this would be obvious as the majority of population lives in areas where no train service is provided.

The next most mentioned reasons are related to service levels: train quality aspects are almost all valued negatively by the majority of people. The most negatively valued aspects are crowding, waiting time and frequency, all at more than 80% dissatisfaction which is not unexpected given the deterioration of rail services from the mid-2010s onwards.

The single most positive aspect related to train service is fare price, where merely 10% of people are dissatisfied. Train is indeed by far the cheapest mode of transport, fares have not increased in the last years, and possibly fare evasion rife. The second-best aspect is safety from accidents, at almost 40% dissatisfaction.

2.2.2 Bus Service

The most negatively valued aspects for bus transport are the facilities at the bus stop at 60% dissatisfaction and associated security aspects both at bus stops and walking to/from the bus stop (30-35%). Crowding in the bus scores 41% and frequency off-peak at 34% dissatisfaction.

Positive aspects for bus transport are the behaviour of bus drivers, fare price, safety, and security on the bus, all around 20% dissatisfaction, and all improved since previous NHTS surveys. Here, the introduction of BRT in some metros might have played a positive role.

2.2.3 Minibus-Taxi Service

The most negatively valued aspects for minibus-taxis are the facilities at the taxi ranks at 56% dissatisfaction, as well as fares, driver behaviour, safety from accidents, and

roadworthiness of vehicles, all between 35 and 40% dissatisfaction. Most of these aspects have improved since previous NHTS surveys.

Positive aspects for minibus-taxis are travel time, access, and peak frequency of the service, as well as security and crowding in the vehicles, all between 20 and 30% dissatisfaction. Most of these aspects have improved over the years.

It can be concluded that amongst regular PT users – mainly PT Captives – the service quality of minibus-taxi and bus has improved, with a few points of attention remaining. It will be interesting to compare their perception of quality with the perceived aspects that withhold non-PT users – mainly Choice Users – not to use PT.

3. SURVEY ON PUBLIC TRANSPORT ASPECTS

In order to assess the quality aspects that discourage Choice Users from using PT on a more regular basis, we sent a survey to all employees of our company in South Africa to survey their current mode of transport to work (and other destinations), and what is discouraging them from travelling by public transport (PT) to work, shopping, etc.

The assumption was that most respondents would not mind using the so-called *new* PT systems (Gautrain, BRT), but are much less likely to use *traditional* PT. The main quality aspects which are presented in the survey as well as the specific factors per main aspect have been compiled and presented in the survey based on the results of the NHTS data (as per section 2), and the quality aspects mentioned in the UCT course on PT systems design and management (UCT, 2023). The survey also gave an opportunity for the respondents to input their own answer instead of the preset ones. Most of these input answers were in line with the preset answers, reworded or expressed in more detail or emphasis.

If respondents already use public transport (which was the case for a mere 5% of the respondents), when answering the survey, they were asked to answer the questions on the quality aspects in the view of “what issues are experienced or what could be improved”.

The survey was conducted using Microsoft Forms and an invitation to participate was circulated via email to all 800+ South African employees across all the various offices (majority from Johannesburg with a few from regional offices) of the company, as well as site locations.

The email introducing the survey mentioned the use of the data for this paper as well as an attempt to improve to uptake in PT to the company’s offices. The aim is for this to potentially be replicated across many companies that have a Car Captive employee base.

4. RESULTS

The survey received 243 responses (a return of 30%) by employees at the various South African offices. In this section, the results of the survey are presented, to understand what is required to get more individuals to use PT to work and other destinations. Various questions on quality perception allowed respondents to select more than 1 response, which resulted in percentages adding up to more than 100%. There was space to add additional considerations and comments at some questions.

4.1 Respondents' Profile

Although the survey was anonymous, it opened with a series of questions profiling the respondents (with an option not to answer):

- 58% of the respondents were male, 41% female. This is slightly off from the company's split of 65% male and 35% female.
- 32% were between ages 20 and 34, 33% between ages 35 and 49, and 35% is 50 or older. Again, this is slightly off (but in the same ballpark) as the company's split of 35% young staff, 42% between 35 and 49, and 23% older; apparently, the older staff was more willing to complete the survey.
- 59% of respondents were White, 19% Black, 12% Indian and 5% Coloured (noting that the remaining 5% chose "Prefer not to say"). The company's split is 50% White, 30% Black, 13% Indian, and 4% Coloured (and 3% foreigner of different races). In the survey, we see an under-representation of Black, and a slight over-representation of White respondents.
- 12% considered themself having a fairly low income, 52% medium, and 22% stated they had a high income (without the questionnaire stating any income brackets); 14% preferred not to say.
- The majority of respondents live in Gauteng (79%) due to the Johannesburg office being significantly larger than other offices, with 87% of the Company's staff. The rest were split between Cape Town / WC (9%), Durban / KZN (5%), East London / Gqeberha / EC (5%); where these regional offices each have 4-5% of the Company's staff, hence an over-representation of Cape Town staff can be assessed. The remainder 2% were 'other' such as site locations.

The first question about the subject matter asked respondents how they generally travel to work, in order to gain an understanding of their current commuting mode i.e. whether it is by public transport or not:

- 90% travel by car, 3% Gautrain (including Gautrain (midi)bus), 2% minibus-taxi, 2% walk, 1% cycle, and 0 respondents reporting commuting to work by bus or Metrorail train. The primary observation of this question is the large majority travel by car to work. This enforces the objective of the survey: to assess the Choice Users' (or rather perceived Car Captives) perception of why they not using PT.
- The low Gautrain usage (noting that most respondents are from the Johannesburg office) meaning this paper's initial assumption of Choice Users being happy to use new PT systems such as Gautrain may not be true; or the trip between Gautrain station and office by midibus feeder being too cumbersome?
- The very low percentage minibus-taxi use may not be representative of the actual number of employees using that mode, due to this survey potentially not reaching many of lower-income support and cleaning staff at the various offices.

The next question asked respondents how often they use PT for commuting to work and other purposes, to give an understanding of their current public transport usage:

- 5% use PT almost daily (correlating with the 3% Gautrain plus 2% minibus-taxi commuters).
- 5% few times a month/week, 15% few times a year.
- 20% hardly ever, and 55% never.

This would indicate that all the following questions in the survey about PT are mostly subjective perceptions since 75% of respondents hardly ever or never use PT, therefore their perception cannot have been based on regular experience, but merely based on subjective perceptions. This could also mean that their perceptions could change with adequate information or more regular usage.

It can be concluded that the respondents are not a representative reflection of the average PT users as per NHTS (section 2), but more a representative reflection of private car commuters. Hence a good start to understand why they are not using PT.

4.2 Main Issues

The next set of questions aimed to identify the main aspects that is withholding people from using PT for commuting to work or other trips. The respondents were asked to select as many reasons (hence the percentage adding up to more than 100%) as they wish from the various main reasons provided (see Figure 2), as well as a space to fill in their own comments:

- 67% are concerned of safety and security issues.
- 58% state there is no route or stop near home or near the destination.
- 33% are concerned about comfort.
- 33% state PT would be too slow.
- 27% have a poor image/experience of traditional PT.
- 22% do not know about route, stops or times.
- 10% say it is too expensive.

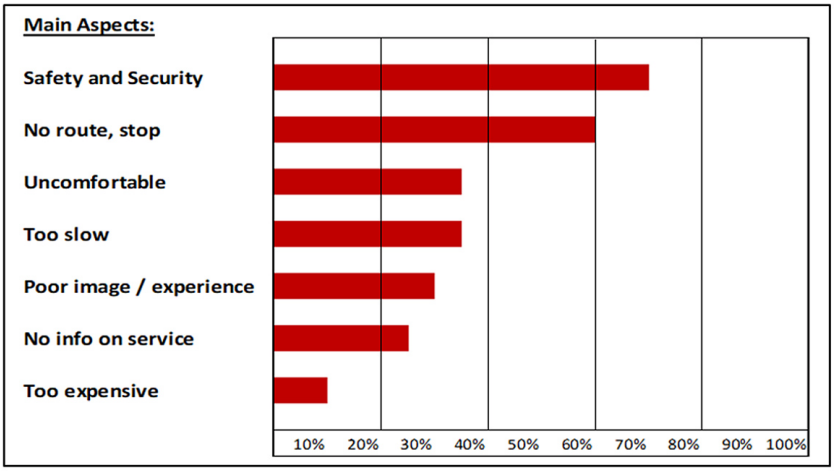

Figure 2: Main aspects

The main aspects are discussed in more detail in the sub-sections below. For each figure, the red bar at the top of the graph indicates what percentage of respondent indicates the score of the main aspect.

4.3 Safety and Security

As mentioned above, 67% of respondents are concerned about safety and security issues. Respondents were asked to pick 1 or 2 of the most concerning aspects (Figure 3):

- 59% indicated security issues (robbery, harassment, etc.) inside the vehicle.
- 53% indicated traffic safety or risk of accidents.

- 47% were concerned about the security between the stop and home / destination i.e. travelling (walking) to/from the PT stop.
- 7% have health concerns i.e. Covid-19.

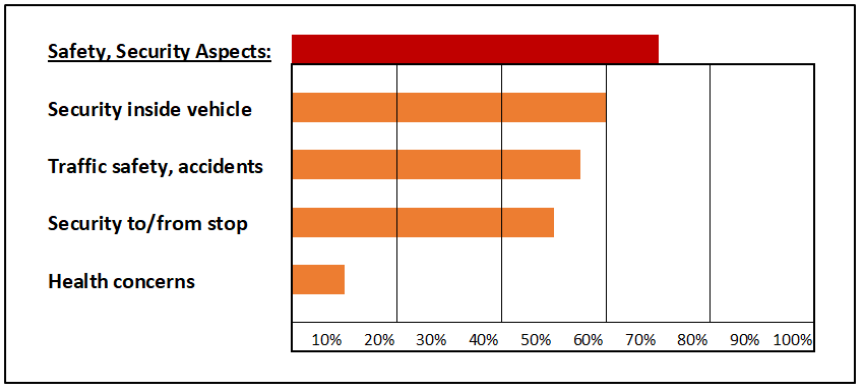

Figure 3: Safety and Security aspects

As shown in Figure 3, 59% of respondents have concerns about safety within the transport vehicles itself, and 53% about traffic safety. There were also a significant percentage of respondents concerned about security between the PT stops and home/destinations.

4.3.1 Fact-Checks

South Africa does not have a good traffic safety record, and is one of the least safe countries (traffic) on the African continent, and in the world (WHO, 2019)

The chance to become victim in a traffic crash is roughly 250 per 1 million population; while top performing countries are 10 times safer. Of the roughly 14 to 15,000 traffic fatalities annually, 38% = 5,500 are pedestrians (most likely as a result of being hit by a motor vehicle), 45% = 6,500 are car drivers and passengers, and 7% = roughly 1,000 are public transport passengers and drivers; the remainder are cyclist, truck drivers and others, to complete the 100%.

Compared to the modal split for these modes, it can be concluded that PT is relatively safe. According to the NHTS, each of the main modes (NMT, PT and Private Car) has roughly 1/3 of the total number of trips (Stats SA, 2021). Therefore, the chances of being killed in a car crash are 5 to 10 times higher than being killed as a PT passenger. Also, as a car driver you have 5 times more risk to hit and kill a pedestrian, than sitting in a PT vehicle. Still, people (as assessed in the survey) assess PT as being unsafe.

When we consider personal safety (i.e. the chance of being involved in an incident like robbery or assault), the statistics are not dissimilar to incidents in normal life. As an example, in the mid/late-2010s, the Railway Safety Regulator (RSR, 2023) has registered less than 1000 incidents per year with passengers in trains or at stations (roughly 3 per day), which is a relatively low number. Currently these incidents with passengers are around 100 per year (likely, not all incidents are reported). To compare: there is a greater chance of being the victim of a car hijack (Stats SA, 2018).

The safety and security aspect seems more like a subjective issue, possibly fed by hear-say and negative images in the press. Interestingly, the regular PT users are not too much dissatisfied with safety and security issues (as per section 2.2). There are certain areas of concern, like the routes towards bus and taxi stops (the public realm), but security inside the taxis and buses themselves do not raise many dissatisfaction flags.

It can be concluded that safety and security should not be a major issue: objectively, PT is much safer than car use or walking. However, subjectively it is perceived as a huge issue. Providing more accurate and actual information could assist in changing this perception.

4.4 Comfort and Experience

33% of the respondents stated that comfort was a main aspect. Below are the results where respondents were asked about the 1 or 2 most concerning aspects (Figure 4):

- 56% indicated poor driver behaviour.
- 53% indicated the PT vehicle being too crowded.
- 26% highlighted poor in-vehicle climate / no air conditioning.

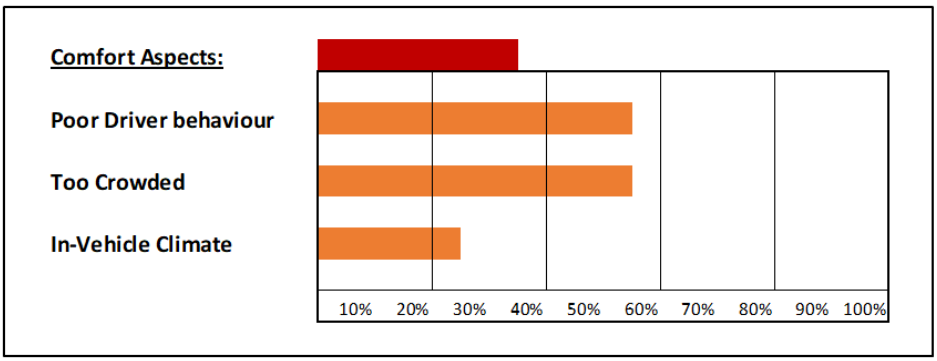

Figure 4: Comfort aspects

The majority of respondents indicated issues with driver behaviours as well as crowdedness of PT. Again, these are perceptions since the vast majority of respondents do not use PT. Better information as well as first-hand experience with PT can change perception for this aspect, although a relatively low percentage (33%) of respondents indicated comfort as a main quality aspect.

4.5 Travel Time

33% of the respondents stated that travel time was a main aspect not to use PT (Figure 5):

- 48% of the respondents stated no direct route or needing to change multiple times (this can also be related to the 58% of respondents reporting no available route or stops as a main aspect).
- 31% stated unreliable service, too many delays or cancellations.
- 29% stated that stops are too far away or too long distance to walk to.
- 28% stated that service is not frequent enough and has too long waiting time.
- 25% stated that the PT route is too slow.

Since the majority of respondents do not use PT, these responses are mostly subjective perceptions; better provision of information could change these perceptions. Perceptions could include: thinking there is not direct route between home and work meanwhile there is but just not well known or difficult to find out about it. A relatively low percentage (33%) of respondents indicated travel time as a main quality aspect, it thus may not be of primary importance.

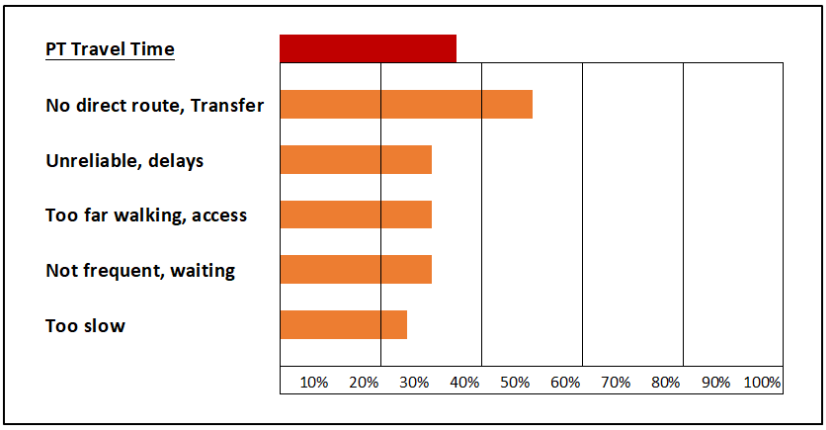

Figure 5: Travel time aspects

4.6 Availability of Information

22% of respondents stated that availability of information was a main aspect impacting their modal choice. The main components of this aspect that were mentioned are as follows (Figure 6):

- 47% indicated that there is no information on which routes would be safe to travel on.
- 42% stated no information on the routes or stops.
- 41% stated no information on timetable schedule, or departure times.

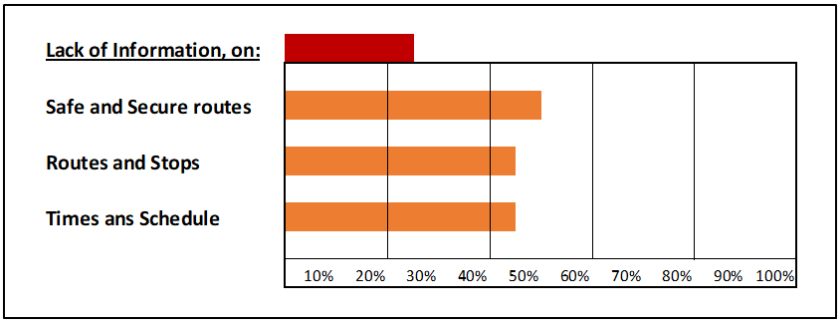

Figure 6: Information provision aspects

Despite a low percentage (22%) of respondents stating this as a main aspect, majority of the other main aspects, such as no routes / stops, might also depend on the non-availability of information. Therefore, this could increase the importance of this aspect. Naturally, not only would better provision of information such as online timetable and routes featuring on travel planning applications help improve this aspect i.e. routes, stops, and times, but also all other aspects which are based on perceptions.

4.7 Required Changes

Similar to the first question – what is preventing/discouraging people from using PT for commuting activities – at the end of the survey the question was asked: what would need to change in order for them to use PT to work, school, shops, or any other trip. The following was indicated (Figure 7):

- 57% mentioned a direct route between home and work (or destination).
- 56% mentioned some form of quality assurance to inform the commuter of a safe and secure route (potentially implying regulation / monitoring).

- 44% mentioned information on the routes, stops and schedule of services.
- 20% would require a guarantee to be seated.

The 57% of respondents mentioning the need for a direct route, may be an incorrect perception, insofar respondents might not be aware of an existing route, when there could actually be one. Better information provision can change this perception or even help 'solve' this required change.

About 19% mentioned that nothing will change their minds. This corresponds to the question below whereby 15% of respondents stated they will not take PT; and considering the approximate value of 5% already taking PT i.e. not changing their mind either.

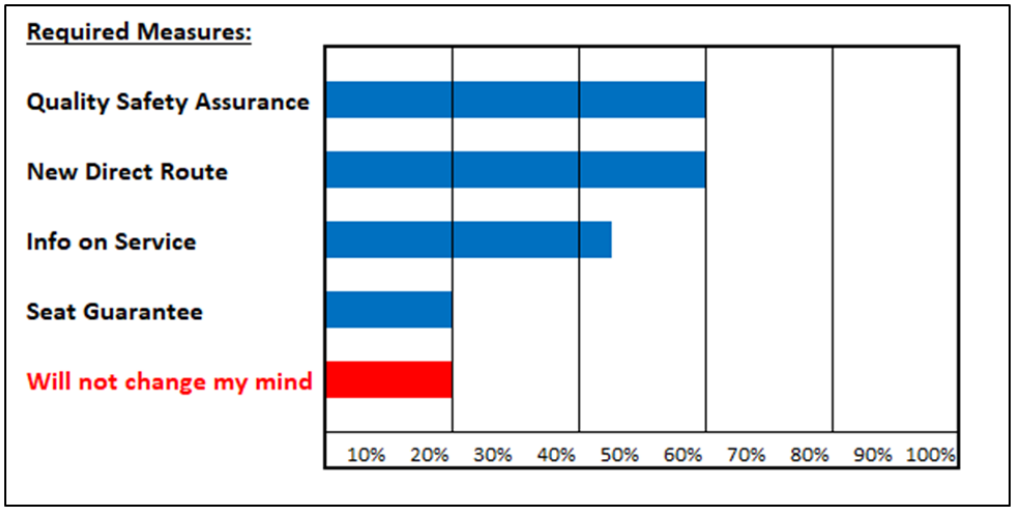

Figure 7: Measures required for respondents to use public transport

4.8 Motivation to Use Public Transport

Respondents were asked that if taking public transport was possible, what would their main motivator be:

- 26% stated that PT is a cheap mode of transport.
- 23% said that PT is more comfortable, less stress, happier lifestyle.
- 16% said PT is good for the environment / helps combat climate change.
- 9% said that PT is faster than walking, or driving in traffic.

While 15% of respondents stated that they will never use PT. The results are shown graphically in Figure 8.

The varied response of positive motivation shows what marketing factors should or could be used to convince people to use PT. 15% of people state they will never use it which is a relatively low percentage and is on-par with other countries with PT of high service levels meaning there is an opportunity to convince about 85% of people to use PT, pending the service levels.

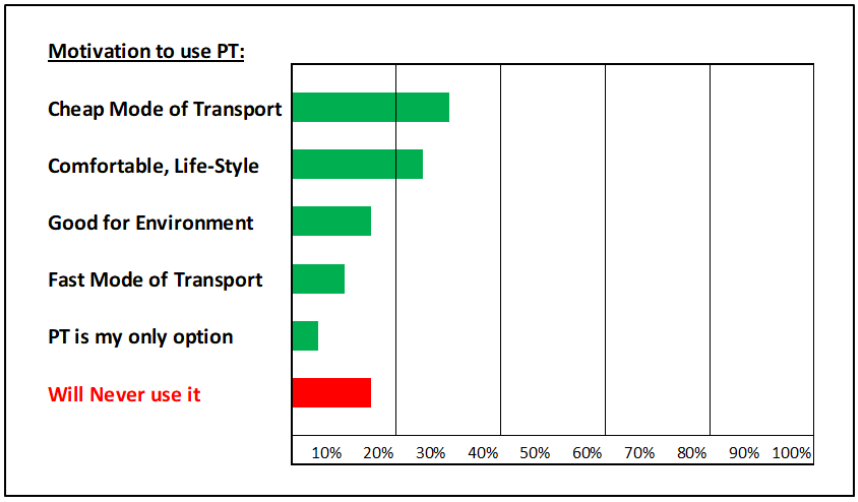

Figure 8: Motivation to use public transport

5. CONCLUSIONS AND RECOMMENDATIONS

From the findings it is evident that there is a wide range of measures that are required to be implemented to get people to use public transport for commuter purposes as well as other trips.

5.1 Short Term

Short-term recommendations are measures which can be undertaken relatively easy, as example by fellow employees or the employer themselves. An easy identified solution could include actual users sharing how offices can be accessed via PT. A practical example could be putting up 'how to' PT posters around the office or on the intranet, explaining step by step how people can get to the office via PT including routes, stops, and times.

Due to many perceptions observed of PT by not regular users, a fact sheet could be created to fact check misconceptions on issues such as safety and comfort among others. Another easy solution to improve PT usage is for people who use PT and are happy with the service to become 'PT Ambassadors' and sharing their positive stories with others to improve others' sentiment towards PT and potentially use it. There is also an incentive for the ambassador: the more positive they are about PT around people, the more people will use it, the better the quality of PT becomes (higher cost recovery resulting in better frequencies and facilities – naturally, in an ideal world).

5.2 Medium Term

Medium term recommendations are measures easy to implement but are generally needed to be done by the service operators or Transport Authority in charge. These measures revolve around information provision of the service and should include accurate timetables (or frequency indicating wait times), routes, stops, and fares (and how it is collected). Secondary information such as comfort information can be provided to help put potential commuters concerns at ease and can include the expected vehicle type, sitting/standing space, and temperature. Route planning should also be provided via an easy-to-use application preferably providing real-time data to help commuters understand their trip.

As the nature of South African PT is often informal, and thus somewhat unmonitored, safety and security are often of concern (as stated by 67% of respondents; but stated by a much smaller percentage of actual users). A form of quality assurance branding of vehicles such as on minibus-taxis where commuters know the service level is monitored i.e. the speed and route of the vehicle as well as knowing the vehicle is 'formal.' An example of such a program was the Blue Dot service in the Western Cape which incentivises drivers based on many metrics.

The informal nature also means there is often no easily identifiable route number for commuters to know that a service will run along a certain route. A solution could be to number minibus-taxi routes and have these numbers and destinations displayed on the front of the minibus-taxi indicating to the commuter which route the minibus-taxi will follow as well as informing the commuter that the service is a 'formal' one. The same could be implemented on conventional bus services such as Golden Arrow which usually just show a destination and no route number. This is especially easy to implement since the operator already has the information of routes but should share that information with commuters in an 'easy to digest' manner such as unique route numbers with a map.

5.3 Long Term

Long term recommendations are measures harder to implement and generally need to be done by the service operator or transport authority in charge, and often at a substantial budget. These measures revolve around the actual improvement of service levels i.e. upgrading an entire system by bettering infrastructure, vehicles, expanding routes, high frequencies, etc.

These improvements are aimed at improving 'traditional' public transport services to the level of the new systems such as BRT networks such as MyCiTi.

5.4 Final Conclusion

Obviously, improving the total PT system is the best way to attract new users, but that will take some time and budget. However, given the fact that many non-users have a possible misconceived perception of the quality aspects of PT, providing more factual information and assist them with route and time information, might convince them. This can be enhanced by sharing stories of colleagues that are current PT users, the so-called 'PT Ambassadors,' that can guide them how to use PT.

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