

**SPECIFICATION OF CUSTOMER SATISFACTION IN PUBLIC TRANSPORT  
SERVICE CONTRACTS**

**MT MOKONYAMA**

**SPECIFICATION OF CUSTOMER SATISFACTION IN PUBLIC TRANSPORT  
SERVICE CONTRACTS**

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A thesis submitted for the partial fulfilment of the requirements for the degree of

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## SUMMARY

### SPECIFICATION OF CUSTOMER SATISFACTION IN PUBLIC TRANSPORT SERVICE CONTRACTS

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The research was aimed at experimentally investigating the relationship between public transport service quality and customer satisfaction in order to inform the specification of customer satisfaction in the design of public transport service contracts. This is important for helping understand how public transport services, and associated contracts, can be systematically adapted to meet the ever-changing needs of customers, potentially leading to increased customer satisfaction or minimisation of dissatisfaction, especially where public transport is explicitly planned to serve as a travel demand management instrument. Furthermore, while the specification of service quality standards is a common practice in public transport contracts, the relationship between the specifications and customer satisfaction is often methodologically unclear.

The concept of customer satisfaction both qualitatively and quantitatively, including associated analytical models, was reviewed, which in turn informed the design, execution and interpretation of the empirical component of the investigation. The empirical component of the research was limited to a strategically important market segment comprising commuters who have access to personal cars but choose or are willing to use public transport. Based on the results of the qualitative and quantitative surveys, the research brought to light an improved understanding of this market segment, and benchmarked these against literature findings. Many of the theories in service research were confirmed, key among them being the important role of negative critical incidents in forming decisions, and also the importance of regarding a service as a package of attributes and not individual attributes. In the particular case of public transport, the entire journey comprises a service, and not just the in-vehicle component. It was also evident that even within this niche market segment, there are diverse needs, requirements and expectations of a public transport service, sometimes expressed incoherently.

The quantitative component of the research confirmed aspects of the qualitative study. Through a conjoint analysis modelling framework it was shown that, due to non-linear effect on customer

satisfaction, not only attribute but attribute levels are critically important in customer service evaluations. In particular, the Kano model effects within customer satisfaction responses were confirmed. It was shown that once a service design has been decided upon, existing and prospective customers are able to consistently evaluate its performance. Existing customers tend to be more tolerant of less than ideal service delivery than prospective customers. Also, customers who have been using the service for a relatively limited period tend to have satisfaction thresholds higher than those who have been using the service for prolonged periods. A logit mode choice model that uses customer satisfaction as input was estimated and showed that retention of existing customers and attraction of new customers are strongly associated with satisfaction. The public transport subsidy implications of this behaviour within the South African context were shown, using subsidised bus services as a case study.

Based on the findings of the research, practical recommendations relating to the incorporation of customer satisfaction, and the manner of doing so, in public transport contracts were made. Key among these are: (i) The need to create, for service evaluation reference purposes, an agreed to service definition formulated by a tripartite arrangement comprising prospective operators, contracting authorities and prospective customers; (ii) Making contract provisions in respect of budgeting for service quality functions such as marketing and monitoring that is explicitly linked to service context, and (iii) Calibrating service performance monitoring instruments on the basis of empirical relationship between customer satisfaction and retention or attraction probabilities.

This research contributes to the state of knowledge in three ways: (i) It empirically informs the design of public transport contracts through linkage with the concept of travel demand management where the current approaches emphasise contractor-authority relationship; (ii) The study brings together various disciplines, particularly service research and transportation sciences, to illustrate how they can be fused for social welfare benefits even for conventionally inert documents such as contracts, and (iii) It provides methodological insights and a method, based on a conjoint experiment and Kano model theory, for the treatment of service attributes in public transport service design, through which it was shown that public transport service attributes can be functionally classified on the basis of customer needs. This might in turn be helpful in setting priorities for service improvements and appropriate benchmarks.

## DECLARATION

I, the undersigned, hereby declare that:

- I understand what plagiarism is and I am aware of the University's policy in this regard;
- The work contained in this thesis is my own original work;
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- Where other people's work has been used, this has been properly acknowledged and referenced;
- I have not allowed anyone to copy any part of my thesis;
- I have not previously in its entirety or in part submitted this thesis at any university for a degree.

Parts of this thesis have been published (or are in the process of being published) in the following conference proceedings and journals:

- Mokonyama, M. and Venter, C. In press. *Engendering customer-responsive public transport contract specifications*. Transportation Research Part A: Policy and Practice.
- Mokonyama, M. and Venter, C. 2013. *Incorporation of customer satisfaction in public transport contracts – A preliminary analysis*. Research in Transportation Economics. Vol. 39, pp. 58–66.
- Mokonyama, M. and Venter, C. 2011. *Incorporation of customer satisfaction in public transport contracts*. Paper presented at THREDBO 12: International Conference Series on Competition and Ownership in Land Passenger Transport, Durban, South Africa.
- Mokonyama, M., Lehasa, S. and Venter, C. 2010. *Unravelling public transport customer satisfaction and dissatisfaction dynamics in the high-end middle class market*. Proceedings of the 29<sup>th</sup> Southern African Transport Conference, Pretoria, South Africa.
- Mokonyama, M. and Kistan, K. 2008. *Public transport service design requirements for the changing face of the South African customer*. Proceedings of the 2<sup>nd</sup> Transport Research Arena, Ljubljana, Slovenia, 21–25 April 2008.

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## 1 INTRODUCTION

The research investigates the relationship between public transport service quality and customer satisfaction in order to facilitate improved specification of customer satisfaction in public transport service contracts. The departure point of the research is that contracts are the only manageable interface between public transport service delivery intent and the actual service experienced by public transport users, where such services are managed through contracts. Therefore, if public transport has a global goal of supporting sustainable development (United Nations, 2012), for example through reducing the rate of natural resource consumption and depletion such as space and air quality, the design of public contracts deserves sterner consideration. One of the ultimate goals, therefore, of carrying out research on public transport contracts, is to understand how public transport services and associated contracts can be systematically adapted to meet the ever-changing needs of customers, potentially leading to increased customer satisfaction or minimisation of dissatisfaction, hypothesised in this research to be critical in public transport service demand.

The research is premised on the notion that much can be learnt about the design of public transport contracts by incorporating knowledge from the emerging discipline of service research, which attempts to answer the questions of how services should be designed, and what they need to comprise of, in order to mediate between customer needs and a service organisation's strategic intent (Goldstein et al., 2002). Two important concepts are distinguishable in service research, namely service design and service delivery (Ramaswamy, 1996), both of which are incorporated in the research. Service design describes elements and features that are planned into the service, which include types of facilities where service is provided and the processes through which service is delivered. Service delivery, on the other hand, describes the manner in which the service is delivered to the customer during a service encounter and ensures that service encounters produce predictable levels of performance. The service design and delivery models from service research are particularly used to inform the design of the empirical measurements of customer satisfaction, as well as to help identify appropriate modelling frameworks, customised, however, for public transport services.

The geographical scope of the research is South Africa, where the country is only beginning to use formal contracts to manage public transport services. Nonetheless, the issues that the research attempts to address are global in nature, particularly the need to devise and implement public transport systems that are responsive to changing societal needs. For example, in developing countries, public transport market share tends to be declining as a result of non-responsive public transport services (Gakenheimer, 1999). In South Africa, for example, Lombard et al., (2007) show that, although patronages of both public and private transport have been increasing in absolute terms, there was on average a drop from 58% to 56% in public transport market share of motorised work trips between 1996 and 2003, and that bus service market share in some cities declined in absolute terms. Globally, Scharfer (1998) shows that with increased development and

urbanisation, travel modal shift tends to be significantly in favour of individualised modes of travel at the expense of public transport. For example, while regions of North America, Western Europe and the Pacific accounted for 16% of the world population, they were responsible for a global travel modal split of 75% of automobile traffic in the 1990s whereas developing countries accounted for 76% of public bus traffic volume which is also rapidly declining due to urbanisation (Scharfer, 1998). In fact, Kitamura, et al., (1999) show that individualised motorised travel, when left unmanaged, becomes a self-reinforcing phenomenon resulting in private car dominated transport systems. However, recent trends indicate that in some industrialised countries with relatively high car ownership, car use may have peaked to the point of declining (Millard-Ball and Schipper, 2011).

Service research argues that a service or product market share can be grown through service innovations and improvements (Ramaswamy, 1996). Given that formalised public transport service delivery is informed primarily by service contracts, the study investigates how this is achievable through the explicit incorporation of customer satisfaction in public transport service contract design.

## 1.1 BACKGROUND

Travel demand management, a phrase that became popular during the 1970s energy crisis period, is a set of tools, including transport policies, strategies and management practices aimed at marginally changing travellers' behaviour in order to encourage efficient use of transport systems, particularly reduced individualised car travel (Ferguson, 2000). An improved public transport service is widely accepted as one of the effective measures for TDM implementation (Gärling, et al., 2002). In fact, based on an empirical survey carried out in Sweden, 76% of private car commuters stated improved public transport as a reason that would compel them to use public transport (Eriksson et al., 2008). The success of the Singaporean TDM measures is attributed to public transport service improvements as one of the key interventions (May, 2004).

In the light of the above, public transport contracts, entered into between public transport operators and transport administrative authorities, are increasingly being used to transform public transport from being production oriented to being more customer oriented (Mouwen and Rietveld, 2013). This is done through incorporating aspects that relate to service quality in the contracts, including such measures as reliability, safety and frequency. However, further research is required to improve how the customers' viewpoint is incorporated in public transport service contracts (Dean and Kiu, 2002; Beirao and Cabral, 2007), and to also show how quality can improve financial performance of public transport services (Gatta and Marcucci, 2007). Customer requirements are indeed complex, and can vary significantly between different regions, between different customers in the same region, and also vary for the same customer at different times (Seth et al., 2005). With particular reference to the understanding of customer requirements for improved public transport service design, a systematic literature review by Redman, et al. (2013) shows that almost all of the research on this theme has mainly been carried out since 1998,

indicating that this research theme is still in its infancy. However, this has not deterred the actual specification of quality-related aspects in contract documents. In South Africa, for example, where the current research is undertaken, based on the review of the history of public transport contracting (Walters and Cloete, 2008), there is no indication of the region specific research that informed the formulation of existing model tender and contract documents (Department of Transport, 2013) used for contracting public transport service. In these model tender and contract documents, apart from supply-related measures such as vehicle quality, safety and punctuality, the only reference to how customer satisfaction should be incorporated in the contracts is that *“passenger satisfaction is measured through passenger satisfaction surveys to assess and monitor passengers’ satisfaction with the quality of services provided and identify areas for improvement”* (Department of Transport, 2013). It is not clear, for example, how such satisfaction ratings are related to decision-making frameworks of existing and potential public transport customers.

Apart from being used as regulatory instruments, public transport contracts are being used to discourage principal-agent problems, also referred to as x-inefficiencies (Kain, 2006). Principal-agent problems arise when one party (the agent) undertakes work on behalf of another party (the principal) and the agent has no incentive to maximise efficiency if poor productivity cannot be verified or proven at a high cost (Kain, 2006). The principal-agent problem is a particular characteristic of monopolistic service providers. It is for this reason that competitive tendering for the provision of public transport services received attention around the world and shown to be effective in significantly reducing operating costs (Gwilliam, 2008). In terms of this arrangement, potential service providers periodically compete for the right to operate a service, renewable after a specified period in line with the provisions of the contract, usually including past operator performance. Through an international review of competitively tendered contracts, Domberger and Rimmer (1994) show that in general this form of contracting tends to generate cost savings, but could not conclusively show its impact on service quality. However, Hensher and Stanley (2003), arguing for the more customer-centric performance-based public transport contracts, indicate that over time the cost savings from tendered contracting regime could become eroded as a result of perpetual successful bids of incumbent operators and reduced competition, subsequently creating near-monopolistic operators that will also exhibit the principal-agent problems. Given that one of the primary goals of contracting, especially competitively-tendered public transport services, is to eliminate principal-agent behaviour, more emphasis in the contracting arrangements has, therefore, tended to be placed on the relationship between the agent (operator) and the principal (government) with little explicit consideration for the needs of the customer. It therefore remains true that in order to provide a service that is responsive to the needs of the customers, such needs should be incorporated directly into the contracts.

In the light of the above arguments, the study investigates the relationship between public transport service quality and customer satisfaction in order to inform the specification of customer satisfaction in public transport service contract design, not just for existing passengers but for both existing and potential future customers.

## 1.2 **PROBLEM STATEMENT**

Planning authorities have a goal to maximise the number of public transport users from the population being served by the service. However, when these services are provided in terms of contracts between the authorities and the contracted operator, the contracts emphasise the relationship between the authority and the operator, with little consideration for the explicit requirements of the customers being served by the service. Where some of the needs of the customers are considered, the contracts often are limited to the existing customers and not the population being served, which is inclusive of the non-users of the service. Furthermore, where customer needs are catered for, it is usually done in a simplistic manner that does not take into account the complex and changing needs of customers, which is essential for improving and maintaining customer satisfaction. The use of these incomplete contracts, from a customer definition and customer requirement perspective, has the long-term impact of limiting the growth of public transport service users.

## 1.3 **OBJECTIVES OF THE STUDY**

The objectives of the study can be summarised as follows:

- a) To review the concept of customer satisfaction both qualitatively and quantitatively, including associated analytical models, and explore its applicability for public transport services.
- b) To carry out empirical research in order to understand the nature of public transport service attributes in respect of their impact on customer satisfaction.
- c) To explore ways to specify customer satisfaction in public transport service contracts in a manner that promotes the patronage maximisation goal of public transport.
- d) To investigate the practical implications of the above in public transport service design and service delivery.

## 1.4 **SCOPE OF THE STUDY**

This research, which is mainly empirical, is specifically aimed at improved practical specification of public transport contracts in a manner that is sensitive to customer satisfaction. The geographical context of the research is a metropolitan region in South Africa, namely Gauteng Province, and the market segment under investigation is a section of the population that has access to a private car but either chooses or may be willing to use public transport, and in this case a passenger rail service. Given their capacity to freely choose their mode of travel, this segment is most likely to be sensitive to service quality. The implications of the findings on the design of public transport service contracts are mainly limited to South African public transport services, which are only recently being managed in terms of formal service contracts.

## 1.5 CONTRIBUTION TO THE STATE OF KNOWLEDGE

The research is part of the growing body of research concerned with the advancement of knowledge in the design of public transport services through improved contracting. The body of knowledge is gaining momentum in line with the changing ownership and management structures of public transport services. The specific contributions of this research to the state of knowledge are empirical in nature, stated as follows:

- a) Empirically, this is the first ever study in the South African context that informs the design of public transport contracts, particularly through linkage with the concept of travel demand management. The current contracting practice is not informed by local research or any identifiable research, and this has the potential risk of creating services that are mismatched with the requirements of existing and potential customers.
- b) Conceptually, the study illustrates how various disciplines, particularly service research and transportation sciences, can be fused for social welfare benefits, even for conventionally inert documents such as contracts.
- c) Methodologically, the study provides methodological insights and a method, based on a conjoint experiment and Kano model theory, for the treatment of service attributes in public transport service design, through which it was shown that public transport service attributes can be functionally classified on the basis of customer needs. This might in turn be helpful in setting priorities for service improvements and appropriate benchmarks

## 1.6 ORGANISATION OF DISSERTATION

The dissertation is organised as follows: Chapter 1 introduces the study in terms of background, scope and objectives. Chapter 2 provides literature review, which synthesises the state of knowledge relevant to the research objectives. Chapter 3 summarises the research methodology and also introduces the public transport service case study. Chapter 4 presents the qualitative experiment design and outcomes and provides inputs into Chapter 5, which presents the quantitative data collection aspects of the research. Chapter 6 presents the estimation of the customer satisfaction model. The practical implications of the research findings are presented in Chapter 7, which is followed by Chapter 8 with study conclusions, Chapter 9 with study recommendations, and Chapter 10 with references.

## 2 LITERATURE REVIEW

### 2.1 INTRODUCTION

The review of literature presented in this chapter synthesises the state of knowledge in respect of customer satisfaction and its applications in both the general service industry and public transport contracts. The importance of quality management in services is illustrated through service research outputs, following which the functional definition of customer satisfaction, its features and measurement frameworks are profiled. The use of the customer satisfaction concept in public transport is then reviewed, as well as how it is modelled and specified in contracts. These are then contrasted with the public transport contract management practices in South Africa.

### 2.2 SERVICE QUALITY AND CUSTOMER SATISFACTION

#### 2.2.1 QUALITY MANAGEMENT IN SERVICES

Quality management is a discipline with a focus on the measurement and improvement of product and service performance, and conformance to standards (Hill, 2012). It is carried out with the aim of ensuring that products and services meet acceptable quality standards. Quality management is especially important in an environment where goods and services are sold in a competitive market, where customers use quality as one of the selection criteria. Out of the quality management discipline, concepts such as Total Quality Management (TQM), Six-Sigma, and Lean Sigma have emerged. TQM is a concept which formally emerged in the 1980s but is traceable to the 1940s in Japan after World War II, when Japan was repositioning itself in the manufacturing sector (Martinez-Lorente et al., 1998). TQM is an approach that entails combining all organisational processes, labour, customer inputs and management to improve quality of production (Hill, 2012). Six-Sigma, which is seen as an improvement on TQM, is a systematic data-driven process used to define customer needs; measure and analyse gaps between expectations and actual performance, including defect analysis; and use the outcomes to continuously improve and control production (Kwak and Anbari, 2004). Lean Sigma, on the other hand, is similar to Six-Sigma, but with a focus on reducing process cycle times as opposed to just variation between expectations and performance (Hill, 2012). These methods have been applied primarily in product development in the manufacturing sector, and only recently the service quality frameworks have attracted foundational research.

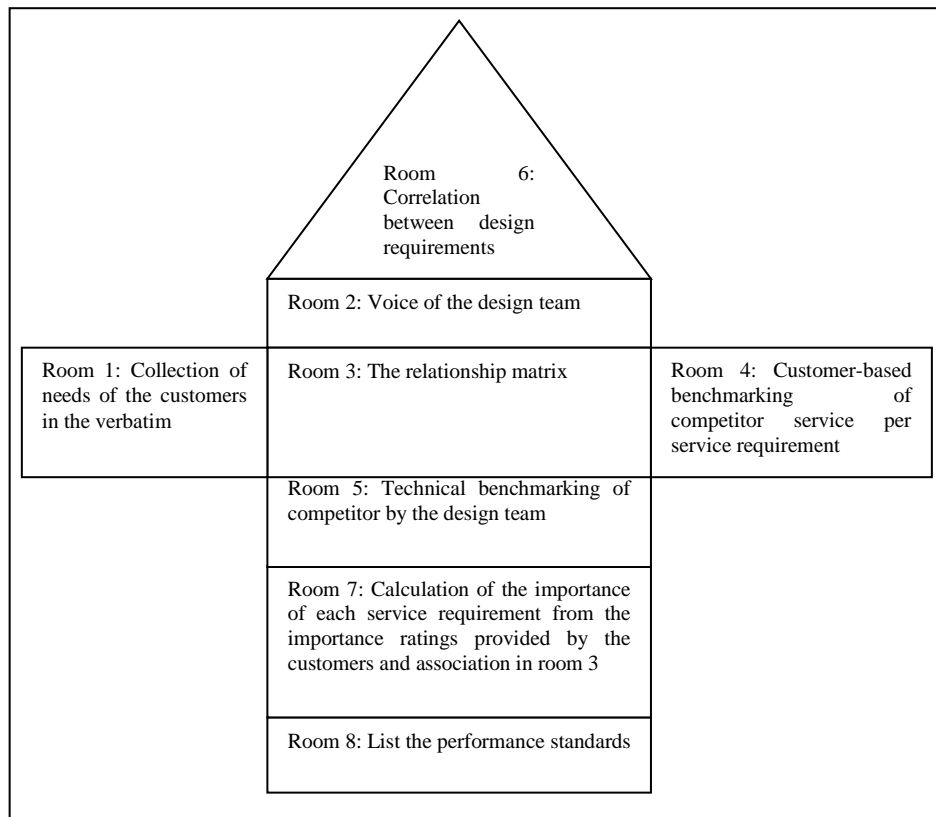
A widely-used framework for specifying quality in product design is the Quality-Function-Deployment (QFD) (Blanchard and Fabrycky, 1981; Ramaswamy, 1996). QFD emerged out of the TQM philosophy and has been historically used in the manufacturing domain. The approach is used to translate basic customer needs, referred to as the “voice of the customer” throughout the entire service process design and delivery using sets of matrices collectively labelled the “house of quality”. The complete house of quality matrix is shown in Figure 2.1. The components of the



matrix, referred to as rooms, which are equivalent to specific design activities, can be described as follows:

- a) Room 1: Collection of basic needs of the customers from the service in the verbatim and the rating of the importance of these needs by the customer. The rating usually takes the form of a five-point scale.
- b) Room 2: This is referred to as the voice of the design team in which a list of the characteristics that the design must have to satisfy the customer needs is prepared from the perspective of the service design team. In this room specific technical measures are listed in a language used by the team and not the actual design.
- c) Room 3: In this room the relationship between the customer needs identified in room 1 and the list of technical requirements specified by the technical team in room 2 is established.
- d) Room 4: In this room the respondents are asked to rate the extent to which competitor service offerings, usually market leaders, meet the individual needs identified in room 1, using a five-point scale.
- e) Room 5: The room comprises technical benchmarking of the competitor by the design team using the technical requirements in room 2.
- f) Room 6: Correlation between design requirements is examined to identify potential conflicts and reinforcement opportunities. Through this process potential gaps are identified, as well as specification duplications, and both are corrected accordingly.
- g) Room 7: The importance of each requirement is calculated from the importance ratings provided by the customers and association in room 3. Where there is correlation between the individual attributes from the two groups, the strength of the relationship is classified in terms of “strong”, “moderate” or “weak” based on the experience of the design team. A strong relationship attracts a high relative weight, followed by moderate and then weak, for example 9, 3 and 1 respectively. A product of the strength of the relationship and the importance rating by the respondents is then used to calculate the absolute importance of the individual attributes, from which the relative importance is also calculated.
- h) Room 8: The room lists the service performance standards. This is accomplished through a procedure that begins with the specification of minimum acceptable satisfaction threshold derived from respondents’ benchmarking results. The attributes are then ranked in the order of decreasing rate of performance rating, followed by ranking in the order of importance. The desired design performance of each of the attributes is decided, prioritising attributes that have higher importance rating and higher decreasing rate of performance rating. The level of satisfaction with the design is predicted through computing individual attribute satisfaction losses, which are summed up to produce overall satisfaction service loss. The loss is

subtracted from the maximum achievable satisfaction and the difference compared to the threshold satisfaction level. The process is repeated until the loss is minimised relative to the threshold, and the solution so provided is affordable and feasible.



Source: Ramaswamy (1996)

**Figure 2.1: House of quality matrix**

Service research, which is more relevant for public transport service design, is only recently gaining momentum in terms of knowledge generation, and recent literature points to the relatively large void in this area (Alonso-Rasgado et al., 2004; Borinoco, 1998; Goldstein et al., 2002; Hill et al., 2002; Maffei, et al., 2005; Tatikonda and Zeithaml, 2002; Tien and Berg, 2003). Interest in consumer behaviour research arose in the 1960s, whereas empirical research into the behaviour of consumer satisfaction and dissatisfaction gained momentum in the 1970s (TCRP, 2003). The earlier empirical studies were based on complaints data received voluntarily from customers. The problem with such an approach to improve services is that such customer inputs tend to be systematically biased to some types of problems (TCRP, 2003). Literature also points to some other reasons for lack of investment in service research, which includes the difficulty of patenting the science of service research, hence limited dedicated financial resources for the research (Alonso-Rasgado et al., 2004).

Service research itself is becoming increasingly important given that countries naturally transition to service-oriented economies (Tien and Berg, 2003; Maffei, et al., 2005). At a micro-economic level it has been shown that, in a competitive environment, increased service quality has the effect of increasing sales and profitability (Anderson et al., 1994). Also in the macroeconomic context,

improved service quality, measured through customer satisfaction, has been shown to be positively correlated with economic growth (Yeung et al., 2013). Nonetheless, while increased service quality may lead to increased market share, increased market share may result in reduced customer satisfaction, especially in heterogeneous service markets requiring personalised attention (Anderson et al., 1994).

## 2.2.2 SERVICES AND CUSTOMER SATISFACTION

In the context of services, customer satisfaction can be defined as a judgement exercised by a customer, following a service encounter, in respect of the extent to which the service fulfilled customer needs or expectations (Grigoroudis and Siskos, 2010). Marketing literature argues that when making a purchase, customers are essentially in need of satisfaction as opposed to the product or service per se (Yeung et al., 2013). Apart from benefits to the customer, customer satisfaction has been shown to be positively correlated with improved business performance and customer loyalty. In the hospitality industry, it has been shown that publicly accessible online hotel reviews, and related service offerings, are strongly linked with business performance (Ye et al., 2009) and the likelihood of new customers using the service (Vermeulen and Seegers, 2009).

The perceived performance of service attributes by the customer is used as a basic input in the measurement of customer satisfaction (Ramaswamy, 1996; Wirtz and Bateson, 1995). These service attributes can either be tangible or non-tangible. Tangible attributes include the physical infrastructure used to serve the customer, and the non-tangible attributes include attributes such as treatment of the customer by the service provider and service pricing. Attributes can also be considered objectively or subjectively from a customer perspective (Eboli and Mazulla, 2011). It is also important to distinguish between transaction-specific and cumulative customer satisfaction (Anderson et al., 1994). Transaction-specific satisfaction refers to evaluation of a post-choice action for a specific service encounter, whereas cumulative satisfaction refers to evaluation of service encounter experiences over time. While transaction type satisfaction may result in an increase or decrease in satisfaction, its effect is marginal, relative to cumulative customer experiences (Anderson, 1994; Ramaswamy, 1996; Friman et al., 2001; Cook et al., 2002; Gilbert, 2006). It is also the actual experience, and not how long it takes, that seems to dominate the assessment of service encounter (Cook et al., 2002). Intangible service attributes also tend to have more effect on satisfaction than tangible attributes (Friman and Gärling, 2001).

Cook et al., (2002) identify three basic human needs for which individuals are continuously seeking gratification, namely security, fairness and esteem, recognising that consumers are people first and consumers second. Security refers to the need to feel free from physical and economic harm, fairness refers to the belief that just treatment is observed and esteem refers to the need to protect and enhance one's self-concept. A violation of any one of these basic needs causes outrage. Furthermore, customers interact with services in accordance with some pre-existing paradigm or script of service encounters, and often a conflict between the service system design and the customer's chosen script is a major source of service failure (Cook et al., 2002).

Artis (2004) shows, through the matrix presented as Table 2.1, that once dissatisfied, not all the customers resort to the switching of service providers, but rather react on the basis of a combination of the dissatisfied customer's chosen coping tactic and the customer's response goal. For example, a combination of "external self-directed coping strategies" and "retaliation goal" results in private vindictive behaviour, which could be exhibited by service captive customers.

**Table 2.1: Dissatisfaction related tactics and dissatisfaction related goals classification table** Source: Artis (2004)

	Prevention goal Prevents a future dissatisfying event	Accommodation goal Accommodates a current or past dissatisfying event	Redress goal Seeks redress for a current or past dissatisfying event	Retaliation Goal Retaliates because of a current or past dissatisfying event
Internal self- directed coping tactics	Anticipate problems Customer mentally braces self for dissatisfaction.	Modify expectations Customer modifies their desired outcomes to fit situation.	Resolve to act Customer mentally commits to dealing with injustice.	Hold a grudge Customer feels deep resentment towards seller.
External self- directed coping tactics	Risk reduction Customer acts to minimise potential problem by taking action.	Accept situation Customer acceptance of seller offer.	No repurchase Customer refuses to support seller in the future.	Private vindictive behaviour Customer anonymously attacks seller.
Voice-coping tactics involving the seller	Informative voice Customer tells wants and concerns to seller in advance.	Refuse to complain Customer elects not to complain.	Complaining Customer openly communicates dissatisfaction with seller.	Public vindictive behaviour Customer attacks seller publicly.
Voice-coping tactics involving peers	Seek advice from non-experts Customer seeks advice from family, friends and co-workers.	Avoid discussing with peers Customer elects not to discuss with peers.	Negative word of mouth Customer shares negative experience with others.	Sabotage word of mouth Customer encourages other customers to hurt seller.
Coping tactics involving third parties	Use experts Customer seeks advice in advance of purchase.	Avoid assistance from expert Customer elects not to use experts when assistance is offered.	Use of mediators Customer uses third party to restore equity.	Consumer activism Customer seeks regulatory and legal remedies to restrict and punish the seller.

The findings by Artis (2004) are in line with Cook et al., (2002). In their research Cook et al., (2002) use a triad comprising the customer, contact personnel and service organisation to describe a service encounter, with the customer and the contact personnel both exercising control over the service process in an environment that is defined by the service organisation, where all three parties need to work together to create a positive service encounter. From a customer perspective Cook et al., (2002) identify three concepts that describe the service encounter, namely, the flow of

the service experience, the flow of time and the counterfactual reasoning in judging the encounter performance. With regard to the flow of the service experience they argue that the service experience is made up of individual time-based experiences, which from a retrospective analysis of the service encounter, vary in terms of the degree of impact on memory and in turn influence future decisions relating to the service. From a review of behavioural science literature Cook et al., (2002) show that memory is based on the trend in the pain or pleasure sequence as well as the ending, where a sequence of improved experiences is preferred and also where the pain or pleasure levels at the end in particular have large influences on perceptions. With regard to the flow of time they show from the review of behavioural literature that it is the actual experience and not how long it takes that seems to dominate the assessment of service encounter. Counterfactual thinking occurs when something good or bad quickly occurs and the individual engages in a mental simulation exercise of situations that did not occur but might have occurred, where causes are viewed as discrete events that determine success or failure; deviations from the norm as causes of unexpected outcome and also where the last event is over-weighted as the cause.

### **2.2.3 MEASUREMENT OF CUSTOMER SATISFACTION**

Ordinal scales such as a five-scale rating between “very satisfied” and “very dissatisfied” are commonly used to measure customer satisfaction. As with any ordinal scale, there is some form of ordering between response categories, but without an indication of the inherent relative differences between the categories. For example, Matzler and Hinterhuber (1998) found that customer loyalty differed significantly between “satisfied” and “very satisfied” customers and, in some cases, customers who were “very satisfied” were six times more likely to repurchase than the ones who were “satisfied”.

Improvement to ordinary ordinal scale has been the incorporation of emotion triggers to illustrate the intensity of the response. For example, Westbrook (1980) shows that the use of phrases such as “Delighted”, “Pleased”, “Mostly satisfied”, “Mixed”, “Mostly dissatisfied”, “Unhappy” and “Terrible” can provide responses more attuned with actual behaviour.

Oliver (1980) introduced a satisfaction measurement construct that measures satisfaction relative to customer expectation prior to using the service through the use of expressions “same as expected”, “better than expected” and “worse than expected”. These expressions are founded on the basis that customer satisfaction is the difference between perceived and expected performance, where higher than expected performance leads to increased satisfaction and performance lower than expected leads to dissatisfaction. Cooper et al., (1989) confirm the practical benefits of the use of an additive form of the construct compared to the ratio alternative.

### **2.2.4 CUSTOMER SATISFACTION IN PUBLIC TRANSPORT**

Customer satisfaction in public transport has only recently attracted focused research attention (Edvardson, 1998; Friman and Gärling, 2001). Such research is important to contribute towards

making public transport market oriented and competitive (Beirao and Cabral, 2007) in contrast to historically market-insensitive monopoly-controlled public transport operations (Sammer, 2009). Nonetheless, it appears that with public transport customers, avoiding dissatisfaction rather than increasing satisfaction seems to be the goal (Friman et al., 2001). Furthermore, Yahya et al., (2007) show, through a survey carried out separately on bus users using new improved services and older unimproved services, that users tended to rate the service as a whole better than the individual service attributes regarded as important by the users. This is also an indication that in public transport services, overall service is perceived by the customer differently from individual service attributes.

While customer-oriented research in public transport is gaining some momentum, there has generally been a divergent view on the selection of variables that represents the needs of the customers in respect of transport services. For example, *A Handbook for Measuring Customer Satisfaction and Service Quality* (TRB, 1999) identifies ten service quality determinants as (i) reliability, (ii) responsiveness, (iii) competence, (iv) access, (v) courtesy, (vi) communication, (vii) credibility, (viii) security, (ix) tangibles and (x) understanding the customer. Based on a reportedly extensive literature review, Hensher and Prioni (2002) propose using 13 attributes, namely (i) reliability, (ii) one-way fare, (iii) walking distance to bus stop, (iv) personal safety at bus stop, (v) travel time, (vi) bus stop facilities, (vii) air conditioning, (viii) information at bus stop, (ix) service frequency, (x) safety on-board, (xi) seat cleanliness, (xii) ease of access into bus, and (xiii) driver behaviour. CSIR (1999) carried out a corridor-based study in South Africa to determine the attributes that are important to the users of rail and minibus taxis, and found that customers are responsive to (i) ticket type, (ii) service reliability, (iii) heating on trains, (iv) feedback to customers, (v) space for luggage, and (vi) minibus taxi safety. Koushki et al., (2003) investigated the compatibility between bus passengers' service expectations and the bus operations management's perceived service priorities and found that passengers regarded (i) noise inside the bus, (ii) bus travel speed and (iii) air conditioning as priorities. Bus service management on the other hand perceived (i) bus cleanliness, (ii) bus maintenance and (iii) bus air conditioning as service priorities. From this Koushki et al., (2003) conclude that the lack of compatibility between customer needs and management's perception of these needs results in the misallocation of resources as well as increased passenger dissatisfaction levels. Several other authors also identify different combinations of what would be considered critical public transport service attributes (Vuchic, 2005). This demonstrates that critical service attributes tend to be area and context specific (Seth et al., 2005). Moreover, customer expectations towards a particular service also change over time in response to changing circumstances (Seth et al., 2005). The important attributes also tend to be affective, and linked to individual perceptions, motivations and context (Redman et al., 2013).

Rietveld (2005) distinguishes between supply (operator focused) and demand (customer focused) service attributes, and shows that supply-oriented service attributes tend to overestimate service quality in favour of the operator, and are generally not reflective of the real level of customer

satisfaction with the service (Rietveld, 2005). Friman (2004b) empirically evaluated the effect of service quality improvements on customer satisfaction before and after the improvements. These improvements were information systems, vehicle standards, increased number of departures, and construction of travel centres. Friman (2004b) finds from this empirical assessment that satisfaction is actually affected by service improvements to a limited extent, in that customers were either less satisfied or no changes in satisfaction were reported, even between frequent and less frequent users as well as different trip purposes. Friman (2004b) attributes these observations to three possibilities: (i) the cumulative frequency of critical incidents during the implementation period may be recalled by the customers and offsetting the immediate benefits; (ii) increased customer expectations may be increased well above the delivered service, and (iii) service provider employees are less equipped to incorporate the changes into the actual service encounter. The second reason is reported in other cases which show that service quality improvements tend to increase customer expectations, and therefore the gap between expected and perceived quality is ever changing to the extent that in the case of Friman (2004b) the expectations far exceeded the actual delivery.

Research on public transport service quality and customer satisfaction has tended to focus on existing users of the services and excludes non-users (Beirao and Cabral, 2007). However, public transport service design is supposed to cater for both users and non-users in order to allow service to become global mobility solutions. When both users and non-users are actually taken into account at the planning stages of public transport services, mode choice models are used to estimate the likely patronage levels of public transport (Ortuzar and Willumsen, 2001). However, these mode choice models tend to be limited in terms of the decision-making explanatory frameworks to explain travel mode choice.

### 2.3 CUSTOMER SATISFACTION MODELLING

The modelling of service processes has historically received attention from the fields of business management and marketing, economics, social studies and psychology (Mont and Plepys, 2003). In business management and marketing the focus is on satisfying and retaining customers in order to maximise profits and improve business competitiveness through market share. Neoclassical economics has generated consumer choice models in which choice is made out of alternatives to maximise personal utility (satisfaction). Social studies have identified four types of consumer choice models: utilitarian (choice based on usefulness of choice), hedonic (special feelings evoked by the choice), sacred products (important choice for sacred individual purposes) and social meaning (choices that reveal social class). The field of psychology has generally been concerned with how individual human attributes influence choice behaviour as well as how individual's surroundings affect the behaviour, generating theories such as lifestyle concept, psychology of sustainable consumption, theory of reasoned action and theory of planned behaviour. The multidisciplinary nature of customer satisfaction as a research theme is bound to generate many modelling frameworks. In fact, through a literature review of customer satisfaction models, Seth et

al., (2004) identify 19 modelling frameworks that are in use. Contributions from the different domains have not been mutually exclusive and much has been gained through a combination of the strengths of each of the frameworks.

The following analysis provides a range of customer satisfaction modelling concepts with a view to identifying their salient features.

### 2.3.1 GAP-BASED MODELS

Gap models, also referred to as confirmation-disconfirmation models, are formulated on the basis that customer satisfaction is a function of the gap between perceived and expected performance (Grigoroudis and Siskos, 2010). In these frameworks, service components that have large gaps are then prioritised for interventions. In its original formulation a typical gap analysis model would allow for the identification and addressing of service attributes exhibiting large gaps between customer expectations and actual performance, with the assumption that all attributes are equally important (Danaher, 1997).

Hill and Alexander (2006) identify five gaps that may lead to customer dissatisfaction:

- a) Promotional gap: There is a gap between what is promoted about the service and what is actually delivered.
- b) Understanding gap: The service manager's perception of customers' expectations is inaccurate.
- c) Procedural gap: The expectations of the customer are not translated into suitable systems.
- d) Behavioural gap: The service specifications are different from what is delivered.
- e) Perception gap: Perceptions of customers about the service differ from the actual service.

Various forms of gap-based model have previously been proposed and applied, including Servqual (Parasuraman, et al., 1985), impact-score technique (TRB, 1999) and importance-satisfaction analysis. In Servqual, Parasuraman et al., (1985) argue that, regardless of the type of service, there are ten criteria used by consumers to formulate expectations and evaluate service quality. In this model the perceived quality by the customer is based on the difference between expected service and perceived service, where expectations are informed by such things as word of mouth, personal needs, and past experience with services. The ten Servqual criteria are:

- a) Reliability: Consistency of performance and dependability.
- b) Responsiveness: Ability of service provider employees to provide timely feedback.
- c) Competence: Possession of the required skills by the service provider employees.



- d) Access: Measure of ease of contact with the service.
- e) Courtesy: Entails aspects such as friendliness, politeness, and respect afforded the customer.
- f) Communication: Informing customer in an understandable language as well as listening to the customers.
- g) Credibility: Entails aspects such as believability, trustworthiness, honesty and sympathising with the customer.
- h) Security: The need to minimise risks and dangers for the customer.
- i) Understanding and knowing the customer: Entails making an effort to understand the needs of the customer.
- j) Tangibles: Entails the appearance of the physical aspects of the service presented to the customer.

It is not known, however, if the SERVQUAL criteria are mutually exclusive. This is especially important in the modelling of service design, where model parameters are estimated. It is also worth noting that service pricing is not included as one of the criteria. Despite this, the work of Parasuraman et al., (1985) has been extensively referenced in the service research literature. In direct response to Parasuraman et al., (1985), Cronin and Taylor (1992) developed a model referred to as SERVPERF, purported to be a better representation of reality than SERVQUAL, which attempts to establish a relationship between service quality, customer satisfaction and purchase intentions. From their research Cronin and Taylor (1992) conclude that service quality is a form of attitude accumulated over time, and on the other hand satisfaction is a transaction-specific measure. Cronin and Taylor (1992) show in their work that service quality is an antecedent of customer satisfaction and that customer satisfaction has relatively more influence on purchase intentions than service quality.

In the impact-score technique, a three-step process is used to measure customer satisfaction, summarised as follows:

- a) Step one: Determine the attributes that have the most impact on customer satisfaction. For each attribute the sample of respondents is divided into two groups. The first group would comprise respondents who have had a recent problem with the attribute in the past 30 days, and the second group those who have not had a problem with the attribute at all or who experienced the problem more than 30 days prior to the survey. Each respondent then scores each attribute in terms of personal satisfaction with the performance of the attribute. The mean satisfaction scores of the two groups are compared and their difference is referred to as the gap score.

- b) Step two: Using a tabular format, each attribute and gap score are entered in the table, and a third column is added which is the percentage of customers who experienced a problem with the service in the past 30 days, referred to as the problem incidence rate.
- c) For each attribute an index, referred to as the impact score, is calculated, which is the product of the gap score and problem incidence rate. The attributes are then presented in a descending order of the impact score.

With the impact score technique, larger gap scores indicate that there is a problem with the attribute. The gap score is further weighted against proportion of customers having a problem with the attribute in order to calculate the impact score, where a large impact score indicates that the attribute requires urgent attention (TRB, 1999).

An example of satisfaction-importance analysis as applied in the passenger transport context is presented by Stradling et al., (2006), where a six-step technique is used, summarised as follows:

- a) Identify salient elements of service delivery through discussions with customers and service providers as well as through literature.
- b) Each element of the service must be rated in terms of importance and performance by the present, prospective or past users. Both importance and performance would typically be in the form of an ordered scale.
- c) Arrange importance and performance ratings in a cross-tabular format to obtain percentage of disgruntled users for each element. The percentage of the disgruntled is the proportion of users who rate the element as important or extremely important and perceive its performance as relatively poor.
- d) Make a plot of disgruntlement against importance for all service elements. Each data point will represent a specific service element. The axes are placed so that they intersect at the centroid of the datasets.
- e) Divide the plot into four zones to enable prioritisation. The quadrant in which the levels of disgruntlement as well as the levels of importance are high, require urgent attention.
- f) The service provider is then urged to make available necessary resources to address service elements that are in need of urgent attention.

### 2.3.2 MULTIVARIATE MODELS

The basic form of multivariate models is linear regression models. With linear regression models the measured customer satisfaction, from some ordered scale, is made a function of the customer-assessed service attributes, with the assumption that the attribute with the highest slope parameter (positive or negative) has the largest impact on satisfaction. While easy to deploy, linear customer-

satisfaction models exhibit multicollinearity problems which in practice are addressed through the use of principal component regression (Danaher, 1997). Furthermore, the assumption of linearity between service performance and customer satisfaction has been challenged and shown to be inaccurate (Lin et al., 2010).

Stated response models, founded on random utility theory, seek to estimate the utility (satisfaction) that a customer derives from a combination of service attributes (Ortuzar and Willumsen, 2001). The models are estimated using survey data obtained by requesting respondents to indicate their individual preferences with a hypothetical combination of attributes and attribute levels based on which the relative strength of the attributes on utility is estimated. The combination of attribute and attribute levels presented to the respondent represent individual services or products that may or may not be available in the market (Hensher, 1994). The respondent can be asked to rank or rate options in the case of conjoint analysis framework or choose an option among alternatives in the case of stated-choice methods (Hensher et. al, 2005). Stated-choice models have historically been implemented on the basis of linear parameterised utility functions. Koppelman (1981), however, notes that the performance of choice models can be significantly improved through non-linear specification of the model parameters and/or attributes. Different transformation techniques would then be used to approximate linearity for the ease of model estimation.

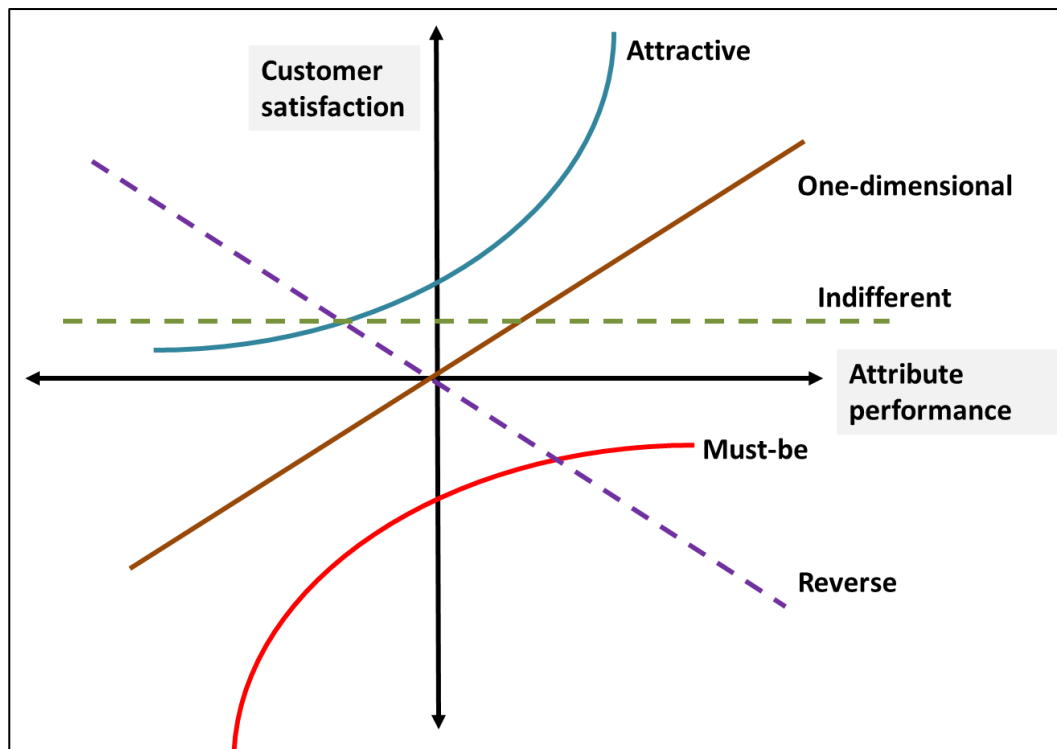
### 2.3.3 QUALITATIVE MODELS

The Kano model, originally developed for product marketing, is used to classify service attributes in terms of their relative impact on customer satisfaction as attribute performance changes. Through a Kano model, shown in Figure 2.2, Ramaswamy (1996), Matzler and Hinterhuber (1998) and Tan and Shen (2000) and several other authors describe five types of attributes identifiable through a qualitative process:

- a) “Must-be” or “basic” attributes: These are basic expectations that a customer has from the service. When provided to the satisfaction of the customer they are often taken for granted. However, should service performance be poor in relation to these attributes, the level of customer satisfaction drops remarkably.
- b) “One-dimensional” or “performance” attributes: Customer satisfaction relating to these needs increases linearly with the attribute performance. Over time, however, these needs may become basic.
- c) “Attractive” or “excite” attributes: Satisfaction of these needs results in disproportionately high customer satisfaction for a given marginal input. Over time, however, these needs may become “one-dimensional” or satisfiers or basic.
- d) “Indifferent” attributes: These are special cases in which the respondent is neutral irrespective of the level of the service attribute.

- e) “Reverse” attribute: these are attributes that customers would not prefer to have, and may even be willing to pay in order to have them removed (Zultner and Mazur, 2006).

In order to classify the attributes into each of the categories, respondents are asked to complete a Kano questionnaire, prepared by the analyst, for each attribute. Basically, from the list of identified service attributes, the questionnaire asks for each attribute two questions, firstly a functional form and secondly a dysfunctional form of the question. For the functional form the respondent is asked to provide feedback on how they would feel if the attribute was in order and the opposite is in the dysfunctional form of the question. Table 2.2 provides a matrix based on which the answers from each respondent are further classified as attractive (A), must-be (M), one-dimensional (O), reverse (R), and indifferent (I). If the answers provided for an attribute by a respondent are not logical, a letter Q denoting questionable is used. Following the completion of the questionnaire by all the respondents, the results are then classified into one of the five categories (A, M, O, R or I) if the largest proportion of respondents fall within the category. Should the categories receive an almost equal share of respondents, it is a possible indication of the presence of different market segments in the sample, and therefore the sample datasets should be disaggregated accordingly (CQMJ, 1993).



**Figure 2.2: Kano model of customer satisfaction**

**Table 2.2: Kano’s attribute classification table**

Service attribute level		Dysfunctional form of the question				
		1. I like it that way	2. It must be that way	3. I am neutral	4. I can live with it that way	5. I dislike it that way
Functional form of the question	1. I like it that way	Q	A	A	A	O
	2. It must be that way	R	I	I	I	M
	3. I am neutral	R	I	I	I	M
	4. I can live with it that way	R	I	I	I	M
	5. I dislike it that way	R	R	R	R	Q

The Kano model has been implemented in numerous service industries, including electronic services (Nilsson-Wittel and Fundin, 2005), banking (Beradovic, et al., 2006) and retail (Lofgren, 2006). The generic response surface of the Kano model formulation is conceptually appealing for application in passenger transport service modelling. For example, it relaxes the assumption of linearity of the relationship between customer satisfaction and changes in service attributes levels, as well as the ability to model changes of satisfaction levels over time for the same attribute level. In practice it has been found that misinterpretation of questions is common, for example, some customers think the “It must be that way” is stronger than “I like it this way” (CQMJ, 1993). Also when applied in the international markets, difficulties were reported with the interpretation of the different question categories, especially for self-completion surveys (CQMJ, 1993). Many researchers report practical difficulties with implementing the Kano classification method and propose more quantitative approaches such as regression (Lin et al., 2010; Chen, 2012).

Brandt (1988) proposes a qualitative attribute classification model referred to as Penalty-Reward Contrast Analysis (PRCA). With PRCA customers rate individual attributes on a scale that has three outcomes: (i) same as expected, (ii) better than expected, and (iii) worse than expected. Attributes are then classified on the basis of answering these two questions: (i) Are the satisfaction ratings for customers whose expectations are exceeded significantly higher than those who are just met? and (ii) Are the dissatisfaction ratings of those whose expectations are not met significantly lower than those whose expectations are just met? Three outcomes are possible: (i) for instance where either lower than expected performance or higher than expected performance produces significantly different service ratings, and this attribute is deemed not critical; (ii) where service ratings of customers whose expectations are not met are significantly lower than those who are indifferent or expectations are exceeded, the attribute is deemed basic, in which poor performance creates large dissatisfaction and high performance has marginal impact on satisfaction, and (iii) for instances where service ratings of customers whose expectations are exceeded is significantly

higher than the ratings of those whose expectations were not met or are indifferent, the attribute is deemed a value-added attribute. If all three different groups produce significantly different ratings across the groups, then the attribute is a hybrid in that poor performance produces significant dissatisfaction and high performance produces high levels of satisfaction.

## 2.4 PUBLIC TRANSPORT CONTRACTS

A contract exists when two or more parties consent to abide by an agreement. For a contract to be in existence there must be an agreement that is legally recognised or enforceable (Treitel, 1989; Christie, 1996). Agreements can be expressed in the form of simple transactions (e.g. buyer accepts to buy at a price offered by the seller), or result from protracted negotiation processes. For an agreement to be valid there must be an offer and an acceptance of the offer. The party making an offer must state the conditions under which the offer is made. Once the terms of the offer are accepted by the other party or parties, then an agreement is concluded. When a contract is in existence, the parties to the contract have a legal obligation to act in accordance with the terms of the contract. A failure to perform may constitute a breach of contract. Once a party to a contract is in breach, the extent of contractual liability needs to be established, out of which the appropriate contractual remedies need to be applied (Treitel, 1989).

The management of the provision of public transport through formal contracts is a relatively recent practise (Gonzalez-Diaz, and Montoro-Sanchez, 2011; Gwilliam, 2008). Where practised it usually replaces decades of a public sector led provision of public transport services in which some organ of state was tasked with the design, operation and regulation of the service. This stems from public sector reform strategy aimed at outsourcing operations that can be better provided by the third parties. The first public transport contracts emerged in the early 1980s in the United Kingdom, coinciding with major public sector reforms (Gwilliam, 2008). Other regions followed, notably Spain in 1987 (Gonzalez-Diaz and Montoro-Sanchez, 2011), The Netherlands in 2000 (Mouwen and Rietveld, 2013), and South Africa in 2006 (Department of Transport, 2006).

Although simplistic classification of public transport contract types is becoming increasingly difficult (Stanley and Van De Velde, 2008), there are generally five types of public transport contracting regimes that are used in practice, namely (i) cost-plus, (ii) gross cost, (iii) net cost, (iv) commercial, and (v) incentive or performance based, varying mainly in terms of the allocation of production cost risks and revenue risks (Hooper, 2008). Under the cost-plus contract arrangement, operators are paid an agreed fixed fee over and above paying them for their operating costs, thus allocating both cost and revenue risks to the authority. With gross-cost contracts the authority retains fare revenue and the operator is paid an agreed fee covering the all-inclusive gross costs of the operator, and in this way both cost and revenue risks are transferred to the authority. With net-cost contracts, the operator is paid the net of gross costs and fare revenue, and the operator retains the fare revenue, and in that way both cost and revenue risks are transferred to the operator. With commercial contracts, the operator retains fare revenue and receives no direct subsidy and therefore both cost and revenue risks are transferred to the operator. With incentive-based

contracts, payment is related to some element of performance, which can take forms such as direct payments or deductions, contract renewal or termination, or historical performance consideration in future contracts. In the case of incentive contracts, therefore, the operator bears cost risk and the revenue risk is shared between the operator and the authority. These contracts are usually awarded to an operator on the basis of competitive bidding process. A sixth category of contracts finding some popularity, for example in South Africa, is the negotiated contracting regime. With negotiated contracts, the terms of operations are agreed with identified operators (not a bidding process) for a limited period, in order to achieve some stated goals such as political or transition management goals (Walters, 2008).

Evidence internationally points to the effectiveness of competitive tendering in lowering public transport costs (Costello and Teeling, 2003) and in the case of the Netherlands, customer satisfaction (Van de Velde et al., 2008). Due to the general lack of interest between competitors to enter into cooperative agreements, however, net cost contracts have been reported to have some negative impact on service integration efforts (Gwilliam, 2005). In order to be effective in achieving service delivery objectives, contracts entered into between authorities and public transport operators usually have some form of performance measure to provide some incentives for improved performance by the operators. This is because service quality can be compromised in the process of minimising revenue risk.

Various forms of public transport performance contracts have been implemented in different parts of the world with varying levels of effectiveness. Gwilliam (2005) reviews experiences with public transport contracting systems around the world and finds that: When contracts are poorly specified, and open to different interpretations, operators become reluctant to adopt them out of fear of potential loss of investments. Furthermore, such poorly drafted performance contracts allow for selective enforcement and potentially create an uncompetitive environment. Gwilliam (2005) also found that some contracts are unrealistic in the expectations they impose on operators, for example requiring brand-new vehicles but unrealistically restricting fares that can be charged. Over-specified contracts in particular tend to be a reflection of the lack of trust between the contracting authority and the operator, which can only be gained over time (Van de Velde et al., 2008).

Recognising the overwhelming focus in the competitive tendering processes on costs alone and less on systematic service quality assessments, Hensher and Prioni (2002) developed and propose a service quality index which measures effectiveness of a service quality oriented competitive tendering. Hensher and Stanley (2003) argue that performance-based contracting as opposed to competitive tendering is more attractive in terms of securing maximum social surplus to the community for a given amount of subsidy. Hensher and Stanley (2003) further argue that the focus of competitive tendering is typically on minimising costs to government rather than on delivering specific quality outcomes. In the case of subsidised services, for example, in performance-based contracting, individual operators are offered a subsidy per vehicle kilometre for the provision of minimum service levels, and an incentive subsidy payment per passenger trip for passenger

numbers above trip numbers associated with minimum service levels, the level of which are subject to social and environmental criteria. Hensher, Stopher and Bullock (2003) provide a framework for implementing performance-based contracts through a Service Quality Index (SQI), and argued that the SQI can incorporate measures that benefit both operators and the public.

## 2.5 SPECIFICATION OF QUALITY AND SATISFACTION IN PUBLIC TRANSPORT CONTRACTS

While research into public transport service quality has received increasing attention, very little research has been carried out on how customer satisfaction and service quality should be specified in public transport contracts and also managed through the contracts (Camen, 2011), particularly in developing countries (Gómez-Lobo and Briones, 2014). It is, however, becoming common to have contract provisions that require that the customer satisfaction with service attributes and service as a whole must be measured and reported, based on which there will either be some reward or penalty as reported in the following examples. This is particularly important in contracts where the contractor has no incentive to increase customer satisfaction, for example, in gross-cost contracts where the contractor does not bear revenue risk.

In the Netherlands, customer satisfaction survey results are used as part of the contracting system for service evaluation, marketing, benchmarking and for the application of bonuses and penalties (Mouwens and Rietveld, 2013). Evaluation of customer satisfaction is in the form of a questionnaire administered en route, with a graduated scale from 1 (poor) to 10 (excellent) for the different attributes and the services as a whole. Operationally, the operator and authority agree on an annual customer satisfaction rating target to determine contractual incentives and disincentives. Should the target be exceeded, the operator receives a bonus payment, and if the target is not reached, the operator is penalised financially (MTPWWM, 2010). In contrast Spain uses a rating scale of 1 to 5 to rate the service quality (Gonzalez-Diaz and Montoro-Sanchez, 2011). In both cases the operator's historical performance in respect of customer satisfaction is also taken into account when the contract is up for renewal (MTPWWM, 2010; Gonzalez-Diaz and Montoro-Sanchez, 2011). In Bucaramanga (Colombia) payment to operators is calculated as a product of productive kilometres operated and a tendered kilometre-based fare, and in turn factored by a quality index which ranges from 75% to 100%, which is derived from a weighted basket of quality measures that include punctuality, frequency compliance, and safety record (Gómez-Lobo and Briones, 2014). Consistent performance below 75% is deemed failure, and leads to contract cancellation (Gómez-Lobo and Briones, 2014). In the case of London, when an operator consistently exceeds contract specified customer satisfaction performance targets, the contract is automatically extended by a further two years in addition to monetary incentives (TfL, 2008). Patronage increases above agreed benchmarks, used as an indirect measure of increased customer satisfaction, have also been used elsewhere for contractor incentive payments (Hensher et al., 2013).



Apart from the inclusion of customer satisfaction ratings, different contracts also specify quality through other performance dimensions such as compliance with minimum vehicle safety standards, extent of adherence to timetable and routes, and safety record. In order to enforce contract service quality provisions, service monitoring is usually in the form of scheduled or non-scheduled field inspections. In many cases, the use of technology to monitor such things as timetable compliance and route adherence is becoming common. These monitoring activities tend to be resource intensive, especially in compliance-rich contracts. However, incorporating incentives in contracts has the potential to reduce performance monitoring costs since the operator is self-motivated to achieve rewarding performance levels (Gonzalez-Diaz and Montoro-Sanchez, 2011).

Several mathematical expressions have been proposed for inclusion in contracts to facilitate the continuous assessment of offered service quality from a customer perspective. Hensher and Prioni (2002) propose the use of a Service Quality Index (SQI) derived from a stated choice model. The SQI in Hensher and Prioni (2002) is a utility function estimated from a multinomial logit model, whose attribute level parameter values are used to indicate the relative importance of the attribute. When assessing the performance of an operator, the values associated with the actual service attribute levels, namely: reliability, one-way fare, walking distance to bus stop, personal safety at bus stop, travel time, bus stop facilities, air conditioning, information at bus stop, service frequency, safety on-board, seat cleanliness, and ease of access into bus, are inputted into the model to obtain the SQI. The SQI for individual customers is summed over a representative sample of customers to estimate the SQI for the whole service. The mathematical representation of the SQI for the individual customer is illustrated in Equation 2.1. SQI for the whole service  $SQI_s$  is then estimated as an arithmetic average of  $SQI_q$  values from  $n$  sampled customers, as illustrated in Equations 2.2.

$$SQI_q = \sum_{k=1}^K \beta_k X_{kq} \quad \dots \text{Equation 2.1}$$

Where

$SQI_q$  = Service Quality Index evaluated by customer  $q$

$q$  = Customer  $q$

$k$  = Attribute  $k$  in a set of  $K$  attributes

$\beta$  = Estimated parameter service attribute  $X_k$ . The parameter  $\beta$  is estimated from fitting the logit model to the observed data.

$X_{kq}$  = The value of attribute  $k$ .

$$SQI_s = \frac{\sum_{q=1}^{q=n} SQI_q}{n} \quad \dots \text{Equation 2.2}$$

Gatta and Marcucci (2007) propose the same SQI formulation but with different attributes and conclude that estimation of customer satisfaction using all attributes is a more reliable indicator

than the assessment of individual attributes. This is because allowing customers to make trade-offs, as they do in stated choice experiments, simulates closely what happens in real life.

Eboli and Mazzulla (2009) propose a Heterogeneous Customer Satisfaction Index (HCSI) in the form of Equation 2.3. HCSI is essentially a summation of weighted ratings of  $k$  service attributes, where both the service ratings and weights are corrected to take heterogeneity of responses into account. The estimation of HCSI is done from customer surveys where customers are required to rate satisfaction with individual service attributes and also rate the individual importance of the attributes.

$$HCSI_s = \sum_{k=1}^N \overline{S}_k^c \cdot W_k^c \quad \dots \text{Equation 2.3}$$

Where

$$\overline{S}_k^c = \overline{S}_k \cdot \frac{\frac{\overline{S}_k}{\text{var}(S_k)}}{\sum_{k=1}^N \frac{\overline{S}_k}{\text{var}(S_k)}} \cdot N \quad \dots \text{Equation 2.4}$$

and

$$W_k^c = \overline{I}_k \cdot \frac{\frac{\overline{I}_k}{\text{var}(I_k)}}{\sum_{k=1}^N \frac{\overline{I}_k}{\text{var}(I_k)}} \cdot N \quad \dots \text{Equation 2.5}$$

In which:

$\overline{S}_k^c$  = mean of the satisfaction rates expressed by users on the  $k$  attribute corrected according to the deviation of the rates from the average value.

$\overline{S}_k$  = mean of the satisfaction rates expressed by users on the service quality  $k$  attribute.

$N$  = number of attributes.

$W_k^c$  = weight of the  $k$  attribute, calculated on the basis of the importance rates expressed by users, corrected according to the dispersion of the rates from the average value.

$\overline{I}_k$  = mean of the importance rates expressed by users on the service quality  $k$  attribute.

Gordon et al., (2013) report on the specification of a performance framework in a proposed metro service. The framework includes incentive payments and deductions for performance in respect of service reliability, increased patronage, asset management and service quality. Service quality in particular included crowding, passenger information, cleanliness, safety and security, complaints handling, and accessibility of services and facilities. With regard to service quality, the authority has a maximum amount that is payable for quality performance, and the operator is paid on a graduated scale in proportion to the level of performance obtained from customers. In the specific case reported, quality performance less than 50% does not attract any form of payment, 50% to

70% performance rating attracts 20% of the maximum payable amount, and the amounts become much higher with higher performance ratings.

## 2.6 PUBLIC TRANSPORT CONTRACTING PRACTICES IN SOUTH AFRICA

South Africa introduced for the first time model tender and contract documents in 2006 (Department of Transport, 2006), which were revised in 2013 (Department of Transport, 2013). The introduction of model tender and contract documents followed the recommendations of the White Paper on National Public Transport Policy (White Paper) in 1996 (Department of Transport, 1996) as well as the recommendation of the Moving South Africa Action Agenda (Department of Transport, 1998) to regulate services through contracts. In terms of the White Paper, contracting for public transport was to be limited to services that receive direct financial support from the state in order to increase competition among prospective operators, and to provide for penalties where the contracted operator underperforms. Other services operating on a commercial basis need only to apply for permission to operate, and based on the transport plans of the respective authorities, permission would either be granted or denied. This implies that at any given time on the public transport network, there are services operating with and without contracts. This further implies that network service quality would by default vary across the network and across operators.

The South African model and contract documents make provision for the monitoring of contractor performance, which specifically evaluates the following predefined measures of service delivery attributes:

- a) Reliability: Measures compliance with the number of contracted trips, measured in terms of the percentage of scheduled trips operated, with a benchmark of 98%.
- b) Punctuality: Measures the extent of deviation from the contracted timetable, measured in terms of the percentage of on-time departures and arrivals at terminal points, with a benchmark of 95% for departures and 90% for arrivals.
- c) Driver quality: Measures the technical skills of the driver and ability to handle passengers effectively, measured through observations of an inspector while the driver is driving, as well as through complaints filed by passengers on the driver, with a benchmark of 2% for both complaints and survey observations.
- d) Bus availability: Measures the extent to which the operator is able to provide the number of vehicles required to service the timetable, calculated as the percentage of scheduled trips operated, with a benchmark of 98%.
- e) Vehicle quality: Measures the ability to comply with predefined vehicle technical specifications, calculated in terms of the percentage of trips that incurred vehicle-related penalties, and trips that were cancelled due to vehicle breakdowns resulting from poor maintenance. A benchmark of 2% is used for trips that incurred vehicle-related penalties,

and 100% procedural compliance is expected on the operator's vehicle maintenance practices at depots.

- f) Safety: Monitors the accident history of the operator, measured in terms of the percentage of trips involved in accidents, with a benchmark of 1%.
- g) Revenue protection: Measures the extent to which the operator has instituted fare evasion prevention measures, calculated as the percentage of fare evasion trips.
- h) Contract compliance: Measures the operator's compliance with administrative requirements of the contract such as submission of standard reports, with a benchmark of 100%.
- i) Passenger satisfaction: Measures customer satisfaction through surveys carried out after the passenger made a trip in the form of rating of selected service attributes (specifically information, safety, security, cleanliness, reliability and staff behaviour) and the service as a whole, with a benchmark of 95%.

Failure to meet agreed performance standards attracts monetary penalties. However, the relationship between the monetary value of the penalties and the contraventions is not explained. Also, the contracts do not provide for any form of incentive. Nonetheless, a contractor's historical performance is used when the contract is due for renewal, where good performance counts in favour of the contractor. The first six months of a new contract are used as an establishment phase, and performance in this period is not penalised, although monetary penalties are imposed after three months. This establishment period is relatively short compared to 2 years reported by Wong (2003) in Hong Kong for railways. Performance is assessed thereafter on a monthly basis in terms of stipulated performance indicators. The South African contracting practice allows for tendered and negotiated contracts that are based on net-cost or gross-cost principles. It is up to the contracting authority to select the most appropriate contract type in line with the provisions of its approved transport plan (RSA, 2009). Three-way disputes between the operators, labour organisations and the government have, over a prolonged period, hampered progress with the implementation of the revised contracting regime (Walters, 2008), further indicating that needs other than customer needs tend to dominate public transport service delivery.

With regard to customer considerations, the Moving South Africa Action Agenda (Department of Transport, 1988) remains the most wide-ranging transport customer profiling exercise undertaken by the South African government. According to this study urban travellers comprise six categories, namely striders (prefer to walk or cycle), stranded (have no access to any form of affordable public transport), survival (captive to the cheapest public transport), sensitive (captive to public transport but select the best option), selective (have access to or can afford private car but choose to use public transport), and stubborn (choose to only use a car). There is no indication of how these market segments were eventually considered when designing the contracting documents. It would appear, nonetheless, that contracting, being public transport subsidy focused, was aimed at managing services catering mainly for captive public transport users. The

contracting documents themselves have no incentive for increased public transport service patronage, implying that the contracts are not necessarily considered instruments that can be used to entice the selective and the stubborn market segments. Furthermore, the contracting documents are focused on buses and not public transport as a whole, to the extent that other public transport modes were regarded as competing modes in the 2006 version of the model contract documents.

It appears from this review of the contracting practices in South Africa that, unlike service research which promotes customer satisfaction as the driver of service delivery, customer satisfaction is merely one of the many things that require compliance. By acting more as a compliance issue rather than being a core business goal, financial performance is also seen as being functionally disassociated from customer satisfaction. It can be concluded therefore that contracting practices in South Africa, and indeed in many other places with practices similar to South Africa, still have much to be learnt from service research.

## 2.7 SUMMARY

As economies progress out of reliance on primary sectors and manufacturing and transition increasingly towards services, the role of service research also increases. The primary purpose of providing services, especially in a competitive environment, is to meet customer needs in a manner that is geared towards satisfying the customer. It has actually been shown that, at a microeconomic level, increased customer satisfaction leads to increased profits, and at a macroeconomic level the economy also benefits through overall growth.

The primary goal of services is to satisfy customers. The customer satisfaction objective function aims to minimise the gap between expectations and the actual service encounter. However, the measurement of the gap between expectations and actual experience is made practically difficult by the measurement of the actual customer expectation, making in turn the computation of the gap between expectation and perception difficult too.

While transaction specific customer satisfaction or dissatisfaction is an important consideration, the goal for services must be to maximise cumulative satisfaction and concurrently minimise cumulative dissatisfaction, made up of repetitive encounters, which have more impact on long term repurchase intentions. Customer dissatisfaction in particular may lead to switching of services or be manifested in many other forms that are detrimental to the business such as negative word of mouth, sabotage, or legal actions, particularly for captive customers.

The use of ordinal scales is firmly established for measurement of customer satisfaction. The scales have been used to evaluate services at both an attribute level and at the level of the whole service. Evaluating the individual service attributes has the benefit of gauging the performance of individual attributes. However, satisfaction evaluation of the service as a whole is more realistic, since customers experience the service as a combination of attributes. In fact, it has been shown that customers tend to rate services as performing better when evaluating the service as a whole as opposed to when evaluating individual attributes.

The adoption of service research in public transport service design, while relatively recent in many respects, is gaining momentum, especially with increased use of competitive tendering systems for service contracts, which has been shown to reduce operating costs, and the need to build in some incentives into the contracts to enhance operator performance. However, more research into public transport service designs that cater for both users and non-users, and not just existing users, is required.

Models that express customer satisfaction as a linear function of service attributes have been shown to be inadequate, because the customer satisfaction response surface has been proven to be non-linear. In the light of this, the Kano model is seen as generalising the response surface in that service attributes can assume a non-linear asymmetric response surface. Furthermore, the Kano model allows for classification of the attributes in line with the relative impact of attribute performance. Owing to the difficulty of practical implementation, several methods have since emerged to facilitate practical application of the Kano model in respect of attribute characterisation. Non-linear stated choice methods have also found application in the modelling of customer satisfaction. These stated choice methods have been used to formulate service quality indices for inclusion in public transport contracts. However, the currently published SQI model is linear. This is also exacerbated by lack of empirical research on user requirements.

The actual specification of public transport service contracts is increasingly including aspects that relate to customer satisfaction. Contract incentives, which include monetary payments or deductions, are then tied directly to the outcomes of customer satisfaction measurements. Incorporating incentives in contracts also has the potential to reduce performance monitoring costs, since the operator becomes self-motivated to achieve improved service levels. In the case of South Africa, while provisions are made for contract monitoring, it appears that service design in the first place is misaligned with recommended approaches in service research literature, essentially rendering monitoring a regulatory compliance as opposed to being a customer satisfaction driven exercise.

The measurement of customer satisfaction presented in literature tends to focus on existing public transport service customers. No work appears to have been carried out on the implication of including non-users in the specification of customer satisfaction in contracts, given that public transport has a social mandate of maximising patronage within the communities being served.

### 3 RESEARCH APPROACH

#### 3.1 INTRODUCTION

This chapter provides the overall description of the research approach and methodology. The chapter illustrates the critical features of the research and the reasoning behind the choice of key research instruments and techniques.

#### 3.2 OVERALL RESEARCH APPROACH

The research effectively followed a six-stage process illustrated in Figure 3.1, entailing the formulation of research questions through to the identification of practical applications of the research findings. The formulation of research questions provided the foundation for the research, and in turn influenced the selection of an appropriate approach to address the research questions. A combination of qualitative and quantitative analyses was adopted in which the qualitative analysis provided relatively more in-depth understanding of the features of the concept of customer satisfaction as it relates to public transport services, and in turn provided a rich context for the quantitative analysis of the findings. The modelling entailed providing a platform for the quantification of contract specifications on customer satisfaction and associated resource requirements. This is then followed by the investigation of how the study finding can be of use in practice in respect of specification of public transport contracts. Each of these steps is explained in more detail in the following subsections.

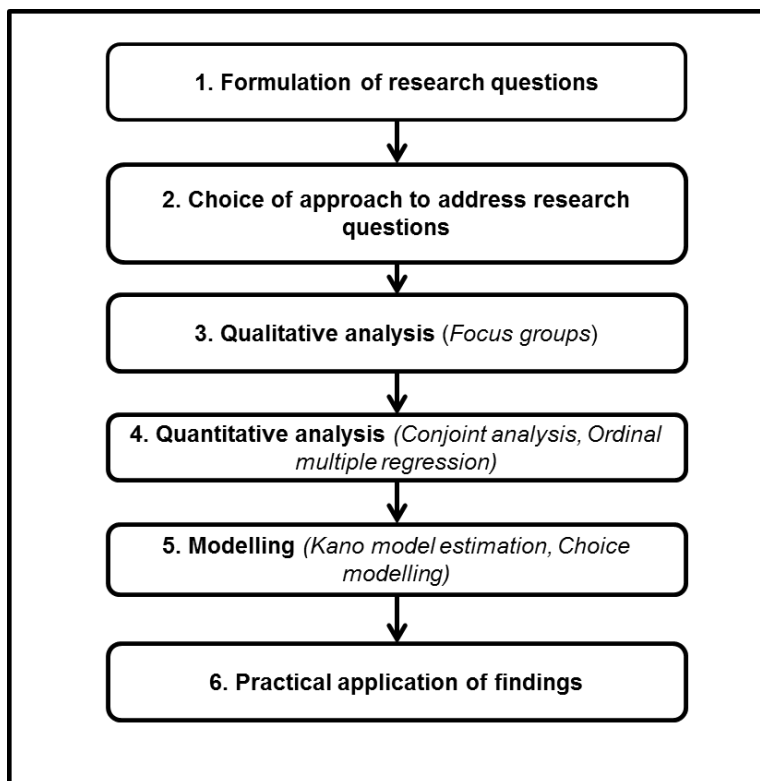


Figure 3.1: Diagrammatic summary of study approach

### 3.3 FORMULATION OF RESEARCH QUESTIONS

The formulation of research questions was mainly informed by the review of literature. The literature search included publications in the fields such as transport operations management, service research, consumer psychology, marketing and government publications in transport management. While many research questions in literature are yet to be addressed, as shown in the previous chapter, the current research addresses the following key research questions:

- a) What is the role of customer satisfaction in public transport services?
- b) What framework is suitable for use in incorporating customer satisfaction in public transport service contracts?

### 3.4 CHOICE OF APPROACH TO ADDRESS RESEARCH QUESTIONS

Contracts are legal instruments that are used to address the lack of trust between parties to a contract. By their nature, contracts are bound to be disputed if they are seen to be unfair to any of the parties or add cumbersome or costly detail to the contract. Therefore, whatever amendment is introduced to a contract, it must be seen as necessary and adding value to what is currently in place.

The research, therefore, needed to empirically illustrate the importance of customer satisfaction in public transport services, and prove that indeed customer satisfaction is an important consideration for public transport service contracts and that it may be currently under-specified. It was therefore necessary to undertake a qualitative survey in order to provide a more in-depth understanding of customer satisfaction from current and potential public transport customers. It was also necessary to undertake quantitative surveys that would provide quantifiable evidence of the role of customer satisfaction in public transport services. This is because in the study of human behaviour, qualitative research methods are an effective tool for understanding “why” people behave the way they do (Bazeley, 2013).

In this study it was important to understand the meaning of customer satisfaction from the customer perspective. It was also important to understand the circumstances under which satisfaction increases or decreases, and what implications this has on the use of the service, thereby warranting qualitative surveys.

In this research qualitative data collection entailed the use of focus groups of choice users and control groups of car-only users. By making a conscious choice of using public transport over private transport, the choice users are potentially sensitive to travel service quality parameters. The qualitative survey responses from this market segment therefore would allow for improved understanding and specification of service attributes in the subsequent quantitative study. The specific outputs of the qualitative survey are: (i) improved overall understanding of the market



being investigated, (ii) understanding of responses of the market to various service-related variables and (iii) typical ranges for service attribute values to which the market is sensitive.

Based on the results of the qualitative research component, conjoint analysis was deemed the most appropriate approach to the design of a survey instrument that would allow for the estimation of the relationship between customer satisfaction and service quality. Conjoint analysis is a multivariate data analysis technique that allows for the estimation of relationships between dependent and independent variables in which the dependent variable can either be a metric or non-metric measure, and the independent variables that are non-metric (Hair et al., 2006). Other attractive features of conjoint analysis are that the effect of each service attribute level is estimated separately and it is therefore not assumed that the attribute levels are related; and also, it can be used to estimate both linear and non-linear relationships, and the types of relationships can vary between attributes. The method has found wide range of applications that include (Gustafsson et al., 2007): (i) new product planning, (ii) improvement of existing products and services, (iii) pricing policies, (iv) advertising and (v) market segmentation. Conjoint analysis is effective for modelling how customers combine the values of individual attributes into the overall evaluation of a service or product. Three types of conjoint analyses can be undertaken, namely: (i) rating, (ii) ordering and (iii) choice-based analysis. The rating alternative allows a respondent to rate a collective set of attributes, while the ordering alternative allows the respondent to order sets of attributes in terms of personal preference, and the choice alternative allows the respondent to choose preferred packages of attributes among alternatives.

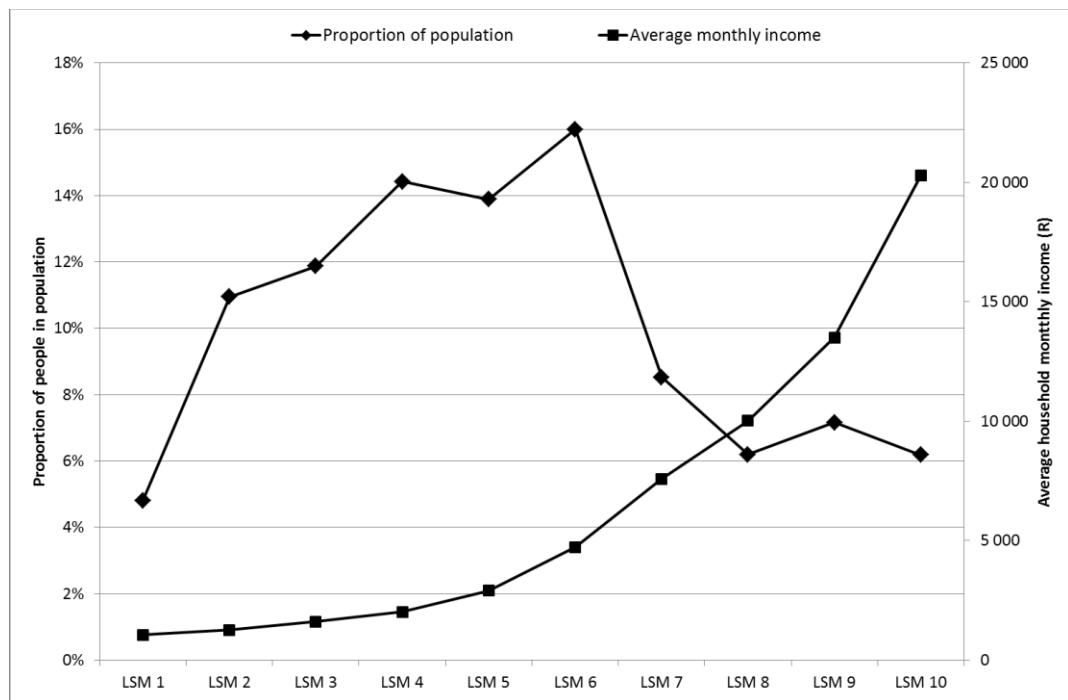
For the purpose of this research, a rating-based conjoint analysis was selected. This option allowed for the design of a number of service packages that are essentially hypothetical packages of service attributes that could be offered on the Tshwane Business Express (TBE). The respondents comprised users of the TBE as well as non-users of the TBE, who share the same trip origins and destinations as the TBE users. Unlike conventional surveys that ask the respondent to evaluate the service once experienced, the method used uses a range of service scenarios to assess customer satisfaction. In all, a total of 36 hypothetical service profiles were assessed by respondents.

A combination of qualitative and quantitative approaches in particular combines the strengths of both approaches to provide research depth. Qualitative approaches are particularly strong with regard to providing context for analysis. Quantitative approaches, on the other hand, allow for systematic measurement of phenomena, based on which changes can be easily monitored and forecasts performed. Finally, in order to be useful to practitioners, the research results needed to be interpreted in manner that would be useful to practitioners.

### 3.5 CHOICE OF A CASE STUDY

Given resource limitations, the empirical research, both qualitative and quantitative, focused on people who are most likely to be sensitive to public transport service quality. This market comprised people who choose to use public transport even though they have access to personal

cars. For benchmarking purposes, a control group of people who only use private cars was also surveyed. Both the users and non-users were recruited by a professional market research firm, with a further instruction to only consider respondents in the Living Standards Measure (LSM) 7 or above. LSM is an indicator used in the field of marketing in South Africa, calibrated regularly by the South African Advertising Research Foundation (SAARF, 2013) to indicate the propensity of a household to acquire goods and services. There are 10 LSM levels from 1 to 10 indicating low to high propensity respectively. LSM is generally positively correlated with household wealth. Figure 3.2 shows for 2008 a snapshot relationship between LSM, proportion of the population and and household income. About a quarter of the population was in LSM 7 and above.

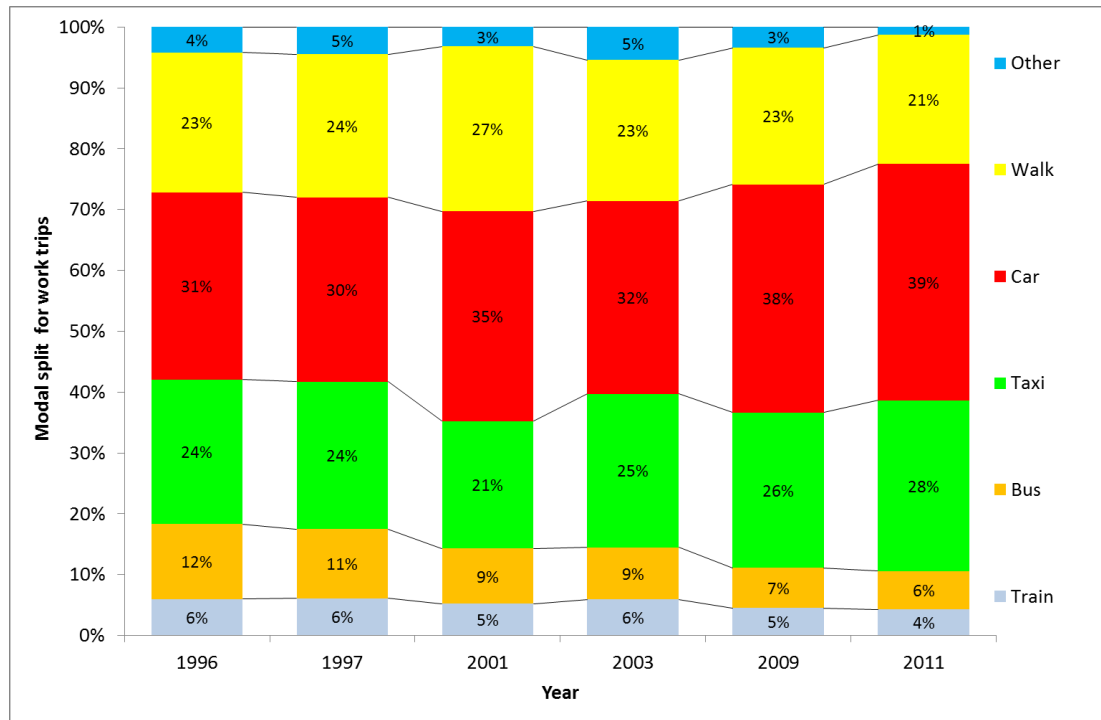


*Source: DPME (2012)*

**Figure 3.2: Depiction of the 2008 relationship between LSM, income and population size**

The public transport market segment characterised by people who have access to personal cars but willing to use public transport in South Africa is very small. Historically in South Africa, personal access to a car has led directly to car use, even for work trip purposes (Mokonyama and Venter, 2007). Nonetheless, the country’s transport policy aims to achieve a ratio of 80:20 between public transport and private car usage (Department of Transport, 1996). In order to illustrate the practical implication of this policy statement, Figure 3.3 shows trends in travel mode for work trips in South Africa in the period 1996 to 2011. From this trend it can be seen that car-based trips have generally been on the increase at the expense of public transport modes, namely taxi, bus and trains. Work-based train trips in particular, which is the main mode of concern in this research, generally make up a small proportion of work trips in the country, albeit marginally higher in metropolitan areas where the services are exclusively provided. For the 80:20 public transport private car usage modal split policy to be realised, however, the country would need to substantially increase the number of people willing to use public transport despite having access to

personal cars. Based on the trend in Figure 3.3, for example, this would imply reversing the 1996–2011 trend three times over. Given this seemingly difficult task, behavioural studies of this specific market segment are therefore warranted in order to inform policy implementation.



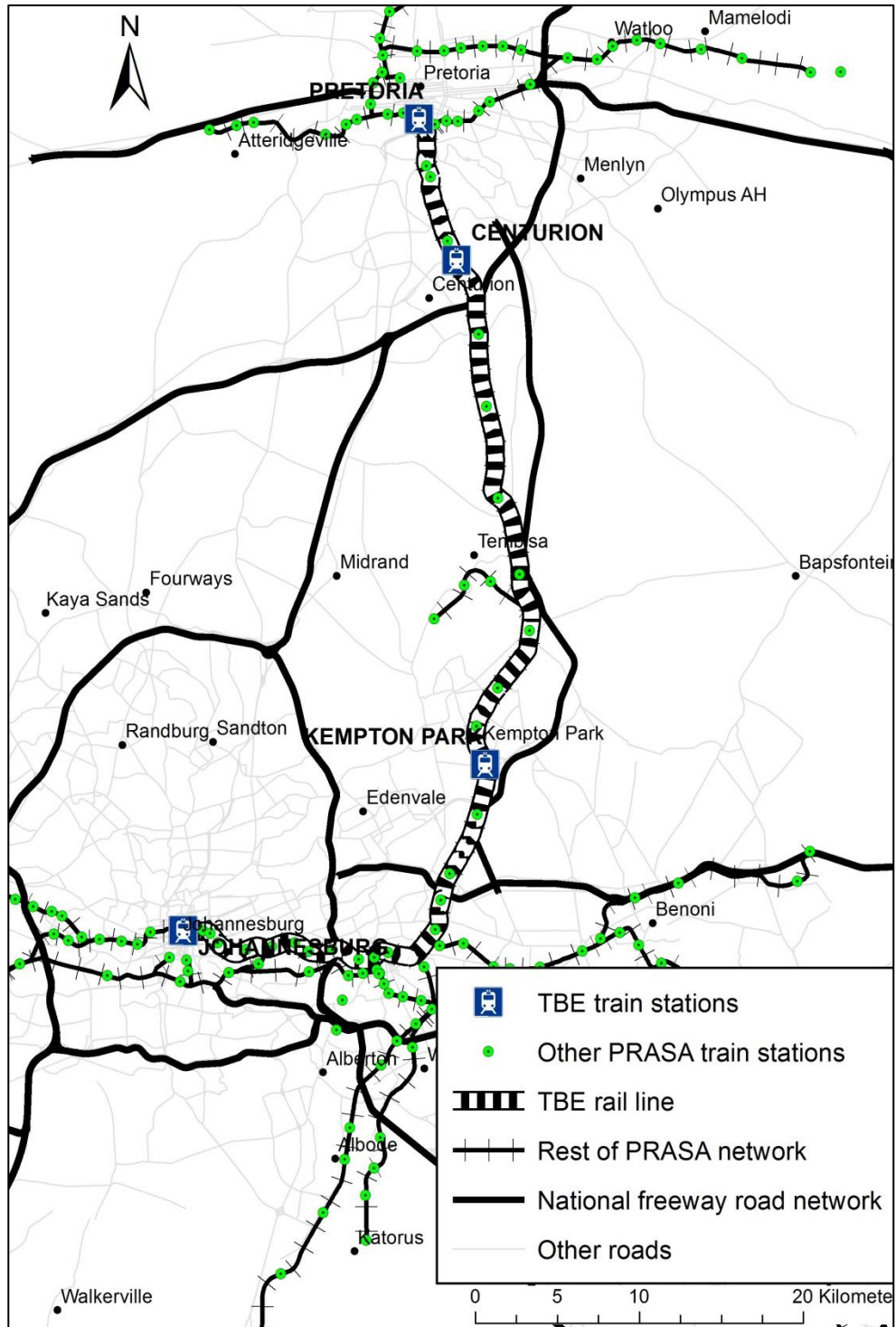
*Sources: Lombard et al., (2007); StatsSA (2012)*

**Figure 3.3: Work-trip mode shift trends in South Africa**

The case study public transport service, operated by a public entity Metrorail, a subsidiary of the Passenger Rail Agency of South Africa (PRASA), operates between the two large cities in South Africa, namely the City of Tshwane (with Pretoria as city centre) and the City of Johannesburg. The location of the line is shown in Figure 3.3. Important to note is that the study was carried out before the implementation of another train service in the corridor, namely Gautrain Rapid Rail Link, as well as the implementation of national freeway road network tolling in the same corridor. These recent developments, however, do not materially change the findings of the current research. If anything, these developments would have had the effect of increasing, in absolute terms, the market size of people with access to personal cars but willing to use public transport.

The case study train service itself comprises a single train servicing a line between the two cities, with a seating capacity of 520 people. The service was designed especially for commuters travelling between the City of Tshwane and the City of Johannesburg, who have access to a private car (most owning the cars), but willing to use a train service in order to avoid peak period road traffic congestion between the two cities, and reduce their travel costs. For historical reasons, the two cities are characterised by relatively large volumes of passengers commuting in both directions. Besides TBE, Metrorail runs train services priced less than the Tshwane Business Express but at higher frequencies and comparatively lower service quality (for example, higher crowding tolerance). In fact, where there is service conflict between the Tshwane Business

Express and other train services, the former takes precedence. The service operational parameters at the time of the research are summarised in Table 3.1 in terms of parameters that include service frequency, fare structure, and on-board services. Unlike typical public transport services, TBE incorporates on-board services such as coach hostesses, newspapers and wireless internet.



**Figure 3.4: Locality of the TBE rail line**

**Table 3.1: Tshwane Business Express train service parameters**

Service parameter	Service details
Service frequencies	<p>One train providing the following services:</p> <ul style="list-style-type: none"> <li>▪ Two services from the City of Tshwane, the first one departing at 06h15 and the other one at 14h30.</li> <li>▪ Two services from the City of Johannesburg, the first one departing at 07h30 and the second one at 17h30.</li> </ul>
Fares	<ul style="list-style-type: none"> <li>▪ Monthly tickets priced at R750, and one way cash fares priced at R35 per trip. Monthly tickets are sold on a specific day in a month and cash is the only accepted means of payment.</li> </ul>
On-board services	<p>On-board services include:</p> <ul style="list-style-type: none"> <li>▪ Security guard per coach.</li> <li>▪ Service hostess per coach.</li> <li>▪ Newspapers provided per coach without additional charge.</li> <li>▪ Warm beverages served on request without additional charge.</li> <li>▪ Wireless internet services without additional charge.</li> </ul>
Other service parameters	<ul style="list-style-type: none"> <li>▪ All passengers are seated (No standing is allowed).</li> <li>▪ Park and ride services provided at no extra charge.</li> <li>▪ A limited route collector and distributor service provided in the form of contracted bus services at no extra charge.</li> </ul>

### 3.6 MODELLING

The relationship between customer satisfaction and service performance was estimated through a conjoint analysis-based model for both TBE users and non-users. Standard statistical tests were performed to assess the reliability of the model and the significance of the parameter estimates. The model was particularly valuable for exploring the validity of different service design theories, as presented in the literature review, and the relevance of the theories for public transport service design. The interpretation of the model results were enhanced by the findings of the qualitative survey.

### 3.7 PRACTICAL IMPLICATIONS OF FINDINGS

Given that the use of public contracts to regulate public transport service delivery is only recently practiced, especially in the South African context, the findings seek to improve the manner in which the contracts are designed in order to be aligned with transport policy, particularly travel demand management ideals. Specific examples on how the practise of contract specification can be enhanced are provided. Furthermore, through comparisons between the current contract specification practices and research findings, the unique contribution of the research to the state of practice is shown. In particular, the implications relating to contract specification, contract monitoring and contracting costs are discussed.

## 4 QUALITATIVE EXPERIMENT

### 4.1 INTRODUCTION

This chapter provides findings made from the qualitative research experiment. Following the overview of qualitative experiments as a research tool, the chapter covers the experimental design adopted, analysis of the data, and implications of findings on public transport service design. Literature is used where appropriate to benchmark the findings.

### 4.2 QUALITATIVE RESEARCH

Qualitative research is aimed at observing, describing, interpreting, and analysing the way that people experience, act on, or think about themselves and the world around them (Bazeley, 2013). It follows, therefore, that the data collected tends to be context rich and highly variable. The main interest with qualitative data is the depth of analysis and understanding of the topic with minimum quantitative measurements (Sarantakos, 2005). This in turn helps to understand new phenomena and facilitate the definition of new theoretical constructs or explain existing ones better (Bazeley, 2013). Furthermore, when used prior to conducting a quantitative survey, the results of the qualitative survey can be used for refining the quantitative survey questionnaire (Grosvenor, 2000). In fact, the findings of the quantitative survey can be correctly interpreted, especially where anomalies are observed. When applied in travel behaviour analysis, qualitative surveys allow the analysts to understand travel behaviour from the perspective of the traveller and in that way eliminate bias introduced by the analyst's decision framework (Mehndiratta, et al., 2001).

Qualitative data analysis can take various forms, including ethnography, conversation analysis, interpretative interaction, case study, narrative analysis, and discourse analysis (Bazeley, 2013). The data collection process can be in the form of participatory or non-participatory approach. The selection of the appropriate methodology is context specific, and depends on the purpose of the analysis. With non-participatory approaches, the researcher makes systematic observations on people in normal settings in order to map their experiences. With participatory approaches such as focus groups, active participation from participants is required and facilitated by the researcher, often in response to open-ended questions. Focus groups entail a trained moderator using a set of prepared questions or a discussion guide with the goal of eliciting participants' feeling, attitudes and perceptions about a specific topic (Puchta and Potter, 2004). The technique uses the communication between participants to generate data to explore what participants think, how they think and why they think that way (Kitzinger, 1995). There is no agreement on the right size for a focus group. Recommended focus group sizes have varied from 4 to 20 (McLafferty, 2004) and also from 6 to 50 (Kitzinger, 1995). Proponents of smaller groups argue that they are easy to manage and generate more intensive exchanges, while proponents of larger groups argue that larger groups produce more research concepts (McLafferty, 2004). There is also no agreement on the number of focus groups on a specific research topic, but there seems to be an agreement that

the correct number is that number which, when adding another focus group to it, does not generate any significant new information (McLafferty, 2004).

Qualitative surveys have been criticised for lack of scientific rigour and susceptibility to subjective interpretation (Clifton and Handy, 2001). However, they offer several advantages over quantitative surveys, especially in providing answers related to the question “Why?”, and in that way relate causes and effects of observed phenomena. This is especially because qualitative methods allow participants to share their experiences in their own words and metaphors rather than to reduce them to the analyst’s predefined list of choices. While qualitative surveys have formed part of scholarly work for many decades, there is no scholarly consensus on the analysis of the survey data to be undertaken (Sarantakos, 2005).

#### 4.3 SURVEY DESIGN AND SAMPLING PROCEDURE

For the purpose of this research, qualitative surveys in the form of small focus groups were carried out. Focus groups were chosen because of their ability to generate large amounts of qualitative data for a given set of resources. The participants were sourced from the users of the Tshwane Business Express (TBE) whose operations are described in Chapter 3, as well as a control group of people who do not use the service but have trip-making patterns similar to those of TBE users. With financial assistance from the Passenger Rail Agency of South Africa (PRASA), a professional market research firm was sourced, whose scope of work was limited to the sourcing of participants, carrying out the field work, digital recording of the surveys, and producing transcripts. The discussion guides for both TBE user and non-user focus groups are contained in Appendix A.

The survey comprised five groups, each with three members, from the train service users and two groups each with four members, from non-users of the service. By nature, due to the time and labour intensive nature of qualitative surveys, the subject sample in qualitative surveys is targeted, and surveys do not seek to be representative but attempt to understand the complexity of issues within the selected sample, and a sample containing about 20 participants is recommended for exploratory research (Mehndiratta, et al., 2001).

Both types of participants, users and non-users, were recruited with the help of the professional market research firm. The users were recruited from the Tshwane train station the day before the interviews took place and asked to be seated in specific coaches on the day of the interview. While the target was three members per group, five people were recruited per group in order to minimise the risks of the minimum number not turning up the following day. For the recruitment of non-users the market research firm used a combination of a snowball technique and sourcing participants from a pre-existing database. All interviews were voice recorded and transcribed. All the participants were guaranteed identity protection, especially the train users, in order to ensure that information is shared as liberally as possible. Therefore, participants’ attributes such as names, race, gender and age were not recorded for the purpose of the interviews, although it is

understood that some of these attributes might influence the decision-making processes and opinion formations, and in turn limit the analysis scope of the survey data.

Table 4.1 provides a summary of the participants' profiles. The survey target market were travellers who have access to personal cars but are willing to use public transport for commuting purposes. From the perspective of the study, and by making a conscious choice of making use of public transport over private transport, this market segment is likely to be very sensitive to travel service quality attributes. This is in contrast to market segments that are captive to public transport or segments that are not willing to use public transport, irrespective of its quality.

For the train users, the interviews took place in the train while it was moving. Therefore, only participants who travelled the longest (duration of 1 hour) were recruited. Three groups were interviewed during morning trips from the City of Tshwane to the City of Johannesburg, and the other two interviewed in the afternoon in the opposite direction. The non-user groups comprised a group that resided in the City of Tshwane and worked in Johannesburg and the other one of participants residing in the City of Johannesburg and worked in the City of Tshwane. The non-users differed from the users in that, while their trip patterns resembled those of the users, they opted to use their car for work trip purposes.

**Table 4.1: Qualitative survey parameters**

Survey design attribute	Users	Non-users
Number of participants	Five groups of three members each. All group members reside in the City of Tshwane but work in the City of Johannesburg.	Two groups of four members each. One group comprises people living in the City of Tshwane but working in Johannesburg, and the other group comprised people living in the City of Johannesburg but working in the City of Tshwane.
Living standard measure (LSM)	LSM 7 and above	LSM 7 and above
Gender	Combination of male and female in each group	Combination of male and female in each group
Places of work and residence	All the participants reside in the City of Tshwane and work in the City of Johannesburg. The geographic locations of work and residence differed for each respondent.	One group of participants resides in the City of Johannesburg and work in the City of Tshwane. The other group resides in the City of Tshwane and worked in the City of Johannesburg.
Survey period	Three on a weekday morning and two on a weekday afternoon, during the month of October 2008	Both on a weekday afternoon during the month of October 2008
Survey location	On-board the train while moving.	Two separate venues in Johannesburg and Tshwane.



The qualitative survey instruments were designed in a manner that would facilitate an improved understanding of the public transport service attributes from the user and non-user perspectives. In particular, the survey sought to understand the following:

- a) The long-term effect of incidents that previously resulted in public transport service dissatisfaction and satisfaction.
- b) Perceptions of what a good public transport service comprises.
- c) Triggers that resulted or would result in travel mode shift.
- d) Importance of selected predetermined service quality variables and thresholds that determine different levels of dissatisfaction or satisfaction.
- e) Determining whether some variables are more important than others and their nature of influence on customer satisfaction.
- f) How the importance of service attributes change over time.
- g) How the service attributes should be specified in the subsequent quantitative survey.

The survey moderators were trained on the instrument through pilot surveys, including guidance on how long the moderator should spend on each question. In summary the instruments consist of the following four stages:

- a) Stage 1: Establishing rapport between the moderator and participants, as well as among participants themselves.
- b) Stage 2: Establishing a baseline in respect of definitions used by participants with regard to service quality.
- c) Stage 3: Experiences with or perceptions about TBE and public transport in general.
- d) Stage 4: Questions about pre-determined service quality attributes in terms of (i) prevailing satisfaction levels in case of users and perceptions in case of non-users, (ii) how and why the attribute is important, and (iii) levels of attribute performance that would result in them stopping to use the service.

All the participants willingly participated in the surveys. Some of the participants further expressed willingness to participate if their inputs were going to be used for service quality improvements. Because English was not always the first language for many of the participants, some of the words and expressions would not always be interpreted consistent with their formal definitions. Where a term or phrase was used for the first time in the discussion, the moderators would define it. The results of the surveys are summarised in the following sections, firstly for the users and then non-users, following which a consolidated review for both groups is provided.

## 4.4 RESULTS

The results of the qualitative surveys are presented in the following subsections, presented firstly for users followed by non-users. The analysis is based on the transcripts recorded from the group discussions. The actual analysis of the transcripts was aimed at identifying key words, emotions, points of agreements and disagreements in order to arrive at a conclusion.

### 4.4.1 TBE Users

#### 4.4.1.1 Signs to show you are being valued as a public transport customer in general

Participants were asked to indicate how they would generally know if they were valued as customers in a public transport service. Many of the participants answered the question in the negative and identified unpleasant past situations to help emphasise this. Minibus taxi drivers and taxi rank officials were singled out as rude and disrespectful to customers. Furthermore, participants felt that in general South Africa does not have a good quality public transport system and they generally do not feel valued as public transport customers. With regard to road-based transport, they indicated that the road-based transport system is not reliable and that congestion is “too much”. The groups indicated that in order to feel valued as customers, the operator has to “listen to commuter complaints” and solve problems for them if there are any. Participants also felt that the operator should deliver the service that is promised. Communication about service operations were also identified as important.

The service quality variables identified by responses to this question are likely to be some of the most important to customers, because it was the main opening question and also due to its open-ended nature. In this regard the following service quality variables are notable as very important: respect for customers, service reliability, communication with customers and service delivery based on promises.

#### 4.4.1.2 Signs to show you are not being valued as a public transport customer in general

In answering the question on signs to show that they may not be valued as a customer, the participants rephrased answers provided for the question in section 4.4.1.1 but with more vivid examples. Participants felt that when service changes take place without their prior knowledge they feel undervalued as customers. The need for improved communication emerged as common among many of the responses. Also emerging from the responses was the need by customers to be fully recognised as recipients of services in line with full recognition of the word service.

From these responses it can be inferred that the provision of quality information and communication services are highly regarded by customers. This is because poor performance on this aspect is equated to being undervalued as customers.

#### 4.4.1.3 Reasons for switching from car to Tshwane Business Express

Participants were asked to provide reasons for switching the mode of travel between the City of Tshwane and the City of Johannesburg from car to public transport and the following reasons were provided (the reasons being largely mutually inclusive):

- a) **Travel time:** Most participants indicated that being able to save on travel time was their biggest considerations for using the Business Express service. Participants said that they did not have to sit in traffic every day, and that by using the Business Express service they felt they did not tire as quickly as when they have to drive a car. Also, when they get home in the evening it is not too late to still do other things.
- b) **Reliability:** The participants felt that the train was their only reliable mode of transport. Some even pointed out that, if they had the choice, they would never make use of any other mode of public transport. One respondent started using the service immediately after changing employment and the reliability of the train service helped with punctuality at the new job.
- c) **Promise of a good service:** Through word of mouth and publicity campaigns participants were attracted to the service. Some of the expressions used to describe the service pull factors included, “The train does not stop at every station” and “The people who used it said the train was always on time” and got motivated by that.

The answers provided can generally be associated with the desire for improved quality of life. This implies that to be successful, and appeal to potential customers, marketing of public transport services needs to explicitly illustrate how the use of the service improves quality of life. Changes in personal circumstances also have a notable impact on decisions to switch modes of transport.

#### 4.4.1.4 Noticeable lifestyle changes

Participants were asked to reflect on how their lifestyles changed, if any, after deciding to start using the Business Express service. Many participants concurred that the reliability of the train service helped them to plan their day ahead with accuracy. The decision to switch modes has also helped them save money every month as a result of spending less on travel costs. Many of the participants also mentioned the relief from physical exhaustion caused by driving in congested roadway traffic, thereby enhancing work and domestic quality of life. Words to describe this include, “When you get home you have energy to face your kids,” “Since using the train I have been able to study and last week Monday I passed with flying colours” and “I am no longer stressed ... I used to swear and get worked-up and I no longer do that.”

All the participants agreed that their lifestyles had improved after making use of the TBE service. Therefore a public transport service that takes into account potential improvements in lifestyles stands a chance of being accepted by customers.

#### 4.4.1.5 Alternative modes to Tshwane Business Express

Participants were asked to list alternative transport modes to the Tshwane Business Express to which they have access. Personal cars were overwhelmingly listed as the alternative. Although not popular, minibus taxis and other Metrorail train services were listed as other alternatives. The participants indicated that they might use their vehicles once a week or some only once a month, or to drive to the station, particularly when they have business meetings or for running some errands during or after work. The participants who indicated that they used their car once a week explained that it is mostly on Fridays when they leave from work earlier. The same reason was given by the participants who make use of other Metrorail train services as an alternative. Other reasons for using their own car or another train service include shift working and being on standby once a week at the office. Driving own vehicles, though, is considered “taxing”, “emotionally draining” and “costly in the long run”.

Participants felt that minibus taxis were generally not a viable alternative, since taxi drivers are believed to be rude and apparently “drive without licenses” and recklessly so. Moreover, they are perceived not to understand or care about their customers. Participants explained that often when someone boards a taxi, the person has to take a seat selected by the taxi personnel and cannot reason with them to take any other seat of their choice. The music played was also “too loud” and the drivers are seen to have no respect for people who do not want to listen to their music.

Participants also indicated that, over time, due to the poor service they received on other public transport services, they started to save for their own car so as not to be reliant on public transport ever again. In general most of the participants also felt that normal train services are not clean, comfortable or safe. They indicate that these trains tend to be very full and they cannot “breathe” when they are in the trains. They describe them as “horrible”. The participants also pointed out that the full train and “people pushing themselves against you” are problematic.

Responses provided indicate that the participants are consciously aware of incentives and disincentives associated with travel mode choice decisions, and these are in turn used to make travel mode choice decisions. Nonetheless, the use of a travel mode does not necessarily imply total satisfaction with it.

#### 4.4.1.6 Dissatisfaction with the Tshwane Business Express

When asked to describe their general dissatisfaction with TBE service, participants mentioned specific incidents that brought about dissatisfaction, and can be summarised as follows:

- a) **Tickets:** Many participants had complaints with regard to the purchasing of monthly tickets and felt that the system needed improvements. In particular, participants found it difficult to purchase tickets. In both cities participants complained that while the ticket sales are limited to specific dates in a month, they are not always sold on those dates; in many cases the tickets would have been sold on an earlier date. Participants also indicated that it is unsafe to walk

around with cash to buy tickets on the fixed monthly dates. The dates on which the tickets are sold come in earlier than the dates on which the participants receive their monthly salaries, and this is seen as burdensome. They also indicated that people who are selling the tickets, reserve tickets for specific people, including their “friends”. Participants said it would be better if tickets were sold on the train as well as at the ticket office in order to make them more accessible. Furthermore, participants felt that the train service should have a way of “recognising” customers even if they forget to bring along their monthly tickets. Given that daily one-way tickets are more expensive than monthly tickets, participants felt that more attention was afforded customers who buy daily tickets as they are seen as bringing much more income.

- b) **Park-and-ride car parking:** Participants felt this was an area that also needed improvement. The number of car parking bays is seen as insufficient. They also complained about their cars being damaged by the sun due to lack of shelters for the parking bays. Although train service management had been asked on numerous occasions to address the problem, the feedback received was that parking bays were owned by a different entity and therefore the operator had no control over the matter.
- c) **Shuttle services:** Participants complained that shuttles were not always available and on a number of occasions they had to make use of private cars. Another complaint was that the spatial coverage of shuttle services was very limited. Shuttle services are sometimes late and the participants end up late for work.
- d) **Communication:** Participants felt that there should be on-board client liaison officers that can communicate with customers when the need arises. Participants also indicated that they want these officers to inform them about things – however small they might be – that might result in delays. Nonetheless, participants indicated that when they had complaints, they were often resolved quickly.

From these responses it is clear that the respondents take into account the whole journey when evaluating the performance of the service and not just the on-board service components. Nonetheless, despite being satisfied with some aspects of the service, the participants continue to use the service.

#### 4.4.1.7 Responses to specific service attributes

Participants were asked to provide their opinions on the importance of a number of predetermined public transport service attributes, and were also asked to indicate how satisfied they were with the performance of the Tshwane Business Express in respect of the service attributes. The survey moderators were also urged to further probe participants on service satisfaction threshold values that would potentially be used to calibrate ranges in the quantitative survey. The following is a list of responses obtained for each service attribute:

- a) **Reliability:** Participants agreed that reliability refers to the ability of a service to deliver on what it promised, especially in respect of timetables. Participants reiterated the importance of communication and felt that any foreseen or unforeseen problems should be communicated to them. Participants also indicated that on an ordered scale of 1 to 10, where the value of 10 represents the best situation, that they give the service the value of 8, which according to participants is equivalent to being acceptable. They indicated that if the service runs late, and it is not the operator's fault, for example as a result of power cable theft, they would understand, otherwise they expect the service to be on time. Some participants felt that they would not use the train in the morning, if it was occasionally 30 or more minutes late, due to work commitments requiring punctual arrival. Some indicated that they were not aware of a day on which the train service was late.
- b) **Security:** For many participants security represented a basic expectation from a public transport service. To this end, while all participants indicated that they would not use the service if more than 10 criminal incidents were reported every month on TBE service, some indicated that they would still stop using the service even if as few as one incident was reported. However, all the participants regarded the current security levels as adequate to the extent that they felt "safe to put a bag down or take out a cell phone" in contrast to other train services operated by the same company. The physical presence of security personnel seemed to be particularly important to the extent that a respondent remarked that "when I see security guards I feel safe". They indicated that the initially-promised security levels drew them to the mode. However, participants felt that, should there be a serious security threat, the current security arrangements would not be adequate to deal with it because they seem ill-equipped.
- c) **Safety:** Most participants were not concerned about safety related to equipment malfunctioning and indicated that this aspect never crosses their minds. However, should there be more than 10 reported cases of compromised safety levels, they would not use the service, depending on the type of incidents and associated levels of threat. In general it was felt that malfunctioning equipment such as a door or window will not stop them from making use of the service. Some participants also felt that there needs to be trained medical personnel on the train or in the vicinity in order to deal with medical emergencies. On whether evacuation procedures should be announced regularly, some participants felt that "people do not want to be reminded about the risks of accidents that could happen" and felt that once or twice a month should be adequate.
- d) **On-board climate control:** There was mixed feedback with regard to the service performance of on-board climate control. Some complained that there were no heaters in the coaches during winter but others contradicted this. Further, while some participants said that the train was "very hot" in summer, others indicated that it was "fine", and some even disagreed on the most comfortable season of the year. Some participants even went as far as saying different human races have different temperature tolerances. A number of participants

felt that there was not enough water on-board, especially during summer. Overall, while participants regarded on-board climate control as valuable, they did not regard it as critical to the extent of saying “even if it is hot, when the train starts to move, the wind pushes through and it is fine”.

- e) **Payment convenience:** Almost all the participants were dissatisfied with the way in which monthly tickets were sold. Some complained that monthly tickets are sold only once a month just before they receive monthly salaries and as a result they find it difficult to purchase them. Furthermore, participants felt that having one day dedicated for selling tickets compromised their security because on the day many people would be carrying large amounts of cash and therefore they become vulnerable to robbery, and they would welcome everyday sales. It was felt that it is safer for commuters to be able to buy the tickets on the train or that a debit card system be implemented. Self-service kiosks were also recommended in order to reduce queue lengths at ticket sales booths and to do away with having to rise early on the sales dates. Participants complained that on the day of ticket purchasing they usually stand in long queues for as long as 30 minutes and often fear that the train will leave them behind.
- f) **Speed of travel:** Participants indicated that they would be dissatisfied if the train stopped at every station. According to the participants, it will probably take the train two hours to reach their destination, the same as regular trains. They said that the limited stop service is one of the main reasons for making use of the service, and this differentiated it from other train services. However, if the train stopped at every station but still managed to travel within an hour between the two cities, it would still remain attractive. This could, for example, be achieved with adoption of improved technology.
- g) **Service frequency:** Participants were generally not satisfied with having only one train service in the morning and afternoon peak periods. The current frequency was criticised for not providing for people who work flexible hours, especially on Fridays where many arrive early at work and also leave earlier, as well as those who work night shifts. Currently participants would rather use their cars on Fridays to allow for the flexibility. According to some participants, the frequency of the train should at least be three services per day per direction. Participants also felt that the frequency of shuttle services should be increased.
- h) **Time to the nearest station:** Participants were generally pleased with the time it took to travel to the nearest station, which was reported as ranging between 10 and 15 minutes. They would not be pleased if the time to station increased to a value as high as an hour, and indicated that they would stop using the service if that occurred.
- i) **Transfers:** Participants felt that they would prefer it if they did not have to transfer from one mode of transport to another. They felt that there should be shuttle services for all commuters in all directions and areas. Most of the participants indicated that they do make use of the shuttle services in order to get to their destinations, and others indicated they make use of

taxis or walk. Many of the participants reach the station in the morning by private vehicles which they park for the day, and take home in the evenings. Asked how they would react if they had to transfer between three to five times, participants said up to three transfers were acceptable but more than this would prompt them to make use of better alternatives.

- j) **Crowding:** Participants were pleased with the current setup where all passengers have a guaranteed seat and no standing is allowed. Increased levels of crowding that include standing passengers would displease the participants for the price they are paying for the service. Moreover, participants felt that increased levels of crowdedness would impede the movement of hostesses along the isles. If the train does get crowded, participants said they “will cross the bridge when we get there” but do not foresee it happening any time soon.
- k) **Information quality:** Participants did not have any strong feelings about the current information quality. However, they felt that they should be informed through a website, electronic mail, or mobile phone text messages if there are service changes or delays. They indicated that it is understandable that there could be delays, but they should be forewarned in order to make alternative arrangements, including making use of alternative modes of transport. Some indicated that they lose money and prospective clients if they are late for meetings as they are remunerated on the basis of time worked. Other participants indicated that communication regarding the ticket sales is poor and that there is no communication between the Tshwane and Johannesburg stations to coordinate the sales.
- l) **Cleanliness:** Participants felt strongly that cleanliness is mainly the responsibility of the passengers.
- m) Sharing the station with other train services is also seen as contributing to some levels of untidiness at the stations. Nonetheless, in most instances the participants felt that the levels of cleanliness of the stations were adequate. They also indicated that the train as well as the toilets at stations were reasonably clean.
- n) **Staff friendliness:** Generally, participants were pleased with the treatment they receive from the train service staff. They however indicated that should the attitudes of staff worsen to be the same as those of minibus taxi personnel, they would consider stop using the service. Some complained about the genuineness of the smiles from the service staff, and when they sense pretence, referred to as “plastic smiles”, they feel irritated and consider changing train coaches. Participants also considered the presence of hostesses to be important as they “enhance the service”. However, the hostesses should respect the people inside coaches and recognise that “without passengers there would not be a Tshwane Business Express”.

#### 4.4.1.8 Responses to general contextual service quality attributes

The survey probed participants on the design of public transport services in general, and for this they were asked to provide their opinions on specific design attributes as well as contextual



service attributes. Where relevant, participants were asked to indicate their perceptions on importance and threshold values to consider switching modes. These are summarised as follows:

- a) **Mixing with people from different backgrounds inside the train:** Generally participants have no problem mixing with people from different backgrounds as it allows them to network. However, unhygienic people as well as people with negative attitudes were singled out as undesirable. Cultural differences such as tolerance or intolerance of public breastfeeding were sources of potential conflict and should be mitigated through improved communication.
- b) **Allowing bicycles on-board:** Participants detested the idea of allowing bicycles on-board even if they assisted other people to conveniently connect to their trip origins or destinations. Reasons provided included that “this is a business train”, “there is not enough space”, and “we don’t want our comfort compromised”. Some felt that it is a foreign concept that is not applicable in South Africa.
- c) **Seat reservation:** Many participants felt strongly against the reservation of seats. They expect public transport seats to be readily available to anyone wishing to make use of them, unless if a “gold ticket” is used. Some participants remarked that even if the seat reservation system is not formally in place it is informally practised to their detestation, where “you come in and see a seat and sit on it and the next thing you get this funny look and an attitude and they forget this is a train and not a plane”, and that sometimes this is racially motivated. The few who supported a seat reservation policy felt that it would allow them to see the same people every day and avoid mixing with “moody” people.
- d) **On-board entertainment:** Participants value the provision of on-board entertainment in the form of television, newspapers and music. Entertainment content preferred varied among participants and included current affairs, movies as well as different types of music. Currently participants receive many newspaper titles per coach and were “happy” with the situation, and unlike in their cars, they are now able to read newspapers while travelling. The number of newspapers was reported by some participants as insufficient at times. Some participants commented that if newspapers were not provided then the train “would not be a business train”. Participants disagreed on the type of music that should be played and also the television programmes that should be shown.
- e) **Fare levels considered expensive:** Participants felt that the monthly R750 they are paying is a fair price for the service they are getting. Anything more than R1200 would be too much. Should they be expected to pay between R1 200 and R1 500 for the service, they would in turn expect a door to door shuttle service. A monthly fare of more than R1 800 is seen as unreasonable. Some participants indicated that they will still use the train if the fare increases, but the operator should inform them well in time. Other participants did say they might be inclined to pay more if the service is improved significantly, for example on-board television

and vehicle parking operations were improved. Some participants felt that absorbing both fare increase and fuel price increases for vehicles they use to arrive at or depart from stations, would be difficult. Participants regarded the planned rapid rail link in the same corridor, namely Gautrain, as a future viable alternative due to its flexibility characterised by “30 minute” headways, and were willing to pay up to R1 600 per month for the planned service.

- f) **Ability to use ticket on other modes:** Participants welcomed the idea of having a single ticket that could be used to board on other public transport modes as long as it does not increase the current fare. Some participants would use the tickets on other public transport modes if they miss the train or a shuttle service.
- g) **On-board conversations with strangers:** Generally participants did not have problems with on-board conversations with strangers, and for some participants, when the opportunity arises they talk about “everyday life” issues, and often these people “become friends” and for others it “relieves stress” in contrast to driving alone.
- h) **Moving home closer to public transport routes:** Many participants did not regard moving their homes closer to public transport routes or station an option. The participants felt that they would consider moving if public transport in South Africa was improved substantially. In fact, buying a car for them to counter poor public transport service coverage is more of an option. The ones that would consider moving their homes closer to public transport routes indicated that in the past they used to live close to the routes and would once more welcome it.
- i) **Locating public transport routes and stations closer to place of residence and frequented destinations:** The idea of relocation of public transport routes closer to the home of participants was generally welcomed, as long as it does not result in fare increases.
- j) **Moving home closer to work:** Similar to moving home closer to public transport routes, the moving of home closer to frequent destinations such as the workplace was not welcome. Many participants residing in the City of Tshwane have a general dislike for the City of Johannesburg as a place of residence. Relocating home is also seen as cumbersome and results in the loss of close contacts with friends and “life you are used to”. Participants felt that it would be easier to change their place of work than place of residence. Those who would consider moving said they wished they had done some intensive “research” before purchasing their residential properties.
- k) **Ability to choose seat:** Generally, participants did not welcome the idea of being assigned or choosing a seat, and pointed out that just having a guaranteed seat is sufficient. Some felt that they would be separated from their friends if seat numbers were assigned randomly to their tickets.

- l) **Ability to voice complaints to the service provider:** Being able to lodge complaints is regarded as important by the participants. The current complaint processing system is seen as ineffective in that they never receive feedback when they use the electronic mail address provided. A centralised complaint processing system is preferred to a decentralised one comprising department-specific complaints register, because it will make it easier for the management to detect and respond promptly to problems. Participants would welcome a toll free telephone number to lodge complaints. The trains usually have on-board duty managers through which many complaints are lodged but participants have no faith in this arrangement.
- m) **Feelings about people seated close by using mobile phones:** Participants indicated that they do not have a problem with other people talking on their mobile phones seated near them. Talking on the phone is seen as a part of normal on-board conversations.
- n) **Interior furnishings:** Participants did not seem to give this aspect much thought and said that the interior of the coaches was “fine”. However, participants felt that a foldable table should be installed at each seat in order to make it easy for them to make use of their laptop computers, as well as cup holders. It was commented that there should be curtains in the train, and if the curtains are taken out to be washed, they should be immediately replaced, and curtains were preferred above shades.
- o) **General uncommon amenities important for satisfaction:** According to participants, despite numerous complaints, there are no water points in the train. Moreover, while participants complained about the lack of toilets in the train nothing has been done about it. Nonetheless, the participants would rather have no toilets than have smelly ones. Electric power points for laptop computers would enhance the service.
- p) **Service attributes important now than a year before:** Being able to read newspapers in-depth has become important to some participants. To some participants having a conversation while travelling has become enjoyable, and the space in the train allows for this to happen effectively. Some participants said the train service itself is now an important part of their lives.

#### 4.4.2 TBE non-users

##### 4.4.2.1 Signs to show you are being valued as a public transport customer in general

Referring to the state of public transport in South Africa, participants felt that they generally did not feel valued as potential users of public transport services. Participants felt safer to make use of their own cars than being subjected to poor public transport services, and minibus taxi services were singled out as the worst culprit. A service that demonstrates good safety record and staffed with respectful people makes participants feel valued.

#### 4.4.2.2 Signs to show you are not being valued as a public transport customer in general

Participants feel unvalued when they do not know which public transport vehicle or route to take and when they ask they receive a hostile response. They emphasised the importance of respectful treatment and recognition from the service providers that by paying for the service customers deserve a good service. Operating non-roadworthy and generally “rundown vehicles” also signals being unvalued as a customer.

#### 4.4.2.3 What it would take to start using the Tshwane Business Express

Participants were asked to indicate what it would take for them to begin using the Tshwane Business Express, and the following answers were provided:

- a) The service must be convenient to use and should allow for a park-and-ride sub-service and operated at high frequency, including shuttle services.
- b) The train must be punctual at all times.
- c) The full information about the service should be made widely available to facilitate decision making.
- d) Trains in South Africa are known to have a bad security record and therefore there needs to be visibly improved security levels.
- e) Service staff must not be rude.
- f) Some participants, however, felt that irrespective of any service improvements they would never make use of the Tshwane Business Express because, regardless of different colours, all train services are similarly poor. Some indicated that while road traffic congestion is a problem, the convenience of the car is far superior to public transport.

#### 4.4.2.4 Alternative modes between Tshwane and Johannesburg

Participants were asked to indicate if they had alternative modes of transport between the City of Tshwane and the City of Johannesburg, and they overwhelmingly pointed out that their cars are the main mode of transport. Other modes were minibus taxis, lift clubs or a lift from friends or colleagues. Buses and trains were seen as generally inaccessible.

#### 4.4.2.5 Dissatisfaction with public transport in general

When asked to describe their general dissatisfaction with public transport in general, participants often made use of specific past incidents to elaborate points, which can be summarised as follows:

- a) **Crowding:** Seating arrangements create a crowded situation, especially in minibus taxis.

- b) **Rude and inconsiderate service staff:** Participants recalled experiences where drivers were asked to stop at specific locations but did not stop. Participants also recalled experiences where drivers did not have change for large bank notes and in some cases were not given the full change and in others were reprimanded ruthlessly by drivers. In another instance, when one of the participants' car was temporarily broken and he had to use a minibus taxi, the driver was asked to turn down the music volume, and in response the driver told the passengers to buy their own cars. Cases of drivers swearing at passengers were also recalled.
- c) **Long queues:** Some participants recalled waiting in unbearably long queues.
- d) **Poor safety:** In one incident, despite being asked to slow down, a minibus taxi driver increased the speed and illegally jumped red traffic lights.

#### 4.4.2.6 Responses to dissatisfaction encounters

Participants were asked to indicate how they responded to negative encounters described above and the following responses were obtained:

- a) The complaining passenger decided to keep quiet after a minibus taxi driver persistently skipped red traffic lights in order to avoid being removed en route from the minibus taxi. The following day the respondent borrowed a car for personal use.
- b) After being refused the right change of money, the respondent was “upset” but kept quiet. However, following the incident, the respondent always paid the minibus taxi fare with the exact amount of money.
- c) One of the participants felt “frustrated” when forced to take a seat chosen by the minibus taxi queue marshal.
- d) One of the participants was “shocked” and “felt like jumping out of the taxi” when told to buy a car after requesting the music volume to be lowered.

#### 4.4.2.7 Responses to specific service attributes

Participants were asked to provide their opinions on the importance of a number of predetermined public transport service attributes, and also asked to indicate their perception of the performance of the Tshwane Business Express in respect of each attribute. The survey moderators were also urged to further probe participants on service satisfaction threshold values that would potentially be used to calibrate ranges in the quantitative survey. The following is a list of responses obtained for each service attribute:

- a) **Reliability:** Participants generally regarded the current public transport as unreliable and some insisted that a reliable public transport in South Africa does not exist. On an ordered scale of 1 (best) to 5 (worst), participants scored the current public transport system at 2.

- b) **Security:** Security was regarded as “very important” by participants. The security provided on the train was compared directly with the security offered by the private car, and the participants felt that their cars offered a higher level of security in that they can lock their cars. The fear of getting “mugged” or being “stabbed” on a train would keep some of the participants from using any train service. With regard to the park and ride service, participants perceived the security services provided for their parked cars at the train stations as inadequate, so it would need to be “beefed up a lot” for them to consider using the service.
- c) **Safety:** Participants conceded that they do not have full control over the safety of their vehicles when driving, and continuously feared being involved in road accidents. They perceived the Tshwane Business Express as relatively safer than their own cars, since the train service has an exclusive right of way. The participants provided solutions to improve road safety and these entailed providing minibus taxis and trucks, which are seen as nuisances, with separate lanes.
- d) **On-board climate control:** Participants overwhelmingly regarded on-board climate control as “very important” as they do not want to arrive at work sweaty or dusty as a result of cabin holes, especially if they interface directly with clients. Their cars are thought to offer better on-board climate control even if they have no fitted air conditioners, as they can open car windows in hot weather. In contrast, due to the crowding in public transport vehicles, it is thought impossible to get “fresh air”.
- e) **Payment convenience:** Participants regarded payment convenience as “important”. For their cars, participants declared that they can use various payment methods. Those explicitly identifying themselves as women participants particularly dislike queuing because they have “a lot of things to do” such as “fetch kids”, “prepare supper” and “attend meetings”. A monthly ticket is preferred to a daily ticket.
- f) **Speed of travel:** The participants felt that while they have full control of the car speed while driving, the roadway congestion makes the overall journey speed unpredictable irrespective of the time of day. Nonetheless, the train service is perceived as worse than a car, since there are a number of alternative routes for cars when there is an incident on a specific route, unlike a train whose route is fixed.
- g) **Service frequency:** Participants used practical examples, and in particular experiences with lift clubs, to illustrate the importance of service frequency. Lift club experiences that relate to a driver being delayed at work, as well as conflicting travel schedules on a Friday after work were considerable sources of conflict. Likewise, the unavailability of train services on demand is undesirable.
- h) **Time to the nearest station:** The unavailability of train services in the vicinity of residential areas were equated to total unavailability of train services.

- i) **Transfers:** Participants regarded transfers as undesirable but did not deliberate at length on this attribute.
- j) **Crowdedness:** Participants agreed that the level of crowdedness is a “very important” service quality attribute. Crowded trains are seen to compromise security. Some participants feel like they lose “respect” and “dignity” when pushed around in crowded places, especially when no one apologises for the incidents. Participants preferred to buy tickets that guarantee a seat.
- k) **Information quality:** Participants acknowledged the general lack of information for private car users, for example the location of road accidents, and identified it as a weakness. Where information is provided to car users through roadside variable message signs it is often unreliable. Participants expected train services to provide information that relate to changes in service schedules as a basic requirement.
- l) **Cleanliness:** Participants had mixed responses about who is ultimately responsible for the cleanliness of the environment. Some participants thought passengers were responsible for the cleanliness of public transport infrastructure, and likened this directly to the responsibility for maintaining the cleanliness of their personal cars. However, some participants expected all train services to have dirty environments and would never use them.
- m) **Staff friendliness:** Participants attributed the name “Business Express” to a professional service and therefore expected the service to be good.

#### 4.4.2.8 Responses to general contextual service quality attributes

The survey probed participants on the design of public transport services in general, and for this they were asked to provide their opinions on contextual service attributes. Where relevant, participants were asked to indicate their perceptions on importance and threshold values to consider before switching modes. These are summarised as follows:

- a) **Mixing with people from different backgrounds inside the train:** Participants have no problem mixing with people from different backgrounds. However, participants have problems with “untidy” people and do not want to be “mistreated by anybody”.
- b) **Allowing bicycles on-board:** Participants conditionally accepted the idea of allowing bicycles on trains. Some participants did not have a problem with bicycles as long as they did not touch them. For some, acceptance of bicycles would depend on their mood for the day, especially if they were neatly dressed. Other participants did not have a problem as long as they had their own on-board spaces.
- c) **Seat reservation:** Most of the participants welcomed the idea of seat reservation in that it would save them time wasted in looking for empty seats and also make it easier to separate passengers in terms of classes. Those against the idea thought time would be wasted when

passengers were looking for their correct seats and that having a guaranteed place to sit was sufficient.

- d) **On-board entertainment:** Participants unanimously agreed that on-board entertainment was “very important”. However, they disagreed on the suitable form of entertainment, which varied between newspapers, television news and sports. Participants would “definitely” consider using public transport if it provided on-board entertainment.
- e) **Fare levels considered expensive:** Many participants had already heard from elsewhere about the fare structure of the Tshwane Business Express and acknowledged that it is considerably cheaper than alternative modes of transport. The maximum acceptable fare ranged from R850 to R1200.
- f) **Ability to use ticket on other modes:** Participants overwhelmingly regarded a single ticket for use in all modes of public transport as a system that would be “very convenient” and a “bonus”.
- g) **On-board conversations with strangers:** Many participants did not have a problem with talking to strangers on public transport vehicles but acknowledged that it is a “personal choice”. However, some stated that it would depend on their moods. Racial differences were cited as communication stumbling blocks.
- h) **Moving home closer to public transport routes:** Participants were generally against the idea of moving their homes closer to public transport routes. Reasons cited were possible deterioration in the security of their homes and the burden associated with the act of moving.
- i) **Locating public transport routes and stations closer to place of residence and frequented destinations:** The participants welcomed the idea of moving public transport closer to their places of residence as well as frequently visited places. In fact, they expect public transport services to be provided in this way.
- j) **Moving home closer to work:** Many participants were altogether against the idea of moving their homes closer to their work places, citing the possibility of changing work places in the near future. Those who welcomed the idea of moving cited reduced out-of-pocket travel costs and travel time savings as well as reduced stress levels.
- k) **Ability to choose seat:** Participants welcomed the idea of being able to choose a seat because it “makes you relaxed” and they would be able to choose a seat compatible with their physique.
- l) **Ability to voice complaints to the service provider:** Participants regarded being able to complain to the service provide as “very important” and a way in which the service provider



“will keep on improving the customer service”. The participants prefer a centralised complaints department, and would also like to offer compliments where appropriate.

- m) **Feelings about people seated close by using mobile phones:** Many participants indicated that they do not have a problem with other people talking on their mobile phones seated near them. Some of the calls could be “emergencies” and “call restrictions would be unfair”. Those against mobile phone users, though they do not like the situation, would not say anything to the phone users, and they themselves would not have phone conversations in the presence of strangers.
- n) **Interior furnishings:** Participants regarded interior furnishing and accessories as important for their journey. Having space to use a laptop is seen as important as well as being able to use internet. Hard and uncomfortable benches in public transport vehicles are unacceptable, especially for long journeys.
- o) **General uncommon amenities important for satisfaction:** Additional amenities regarded as essential by participants included: pull up tables for work purposes, electric power points and on-board refreshments. Participants reiterated the importance of effective and visible security services for themselves and their parked cars. Increased spatial coverage of shuttle services would urge them to use the train service as well as improved information dissemination about the service.
- p) **Service attributes more important now than a year before:** Participants could not recall any specific travel attributes that were more important currently than they were a year ago. However, having been interviewed about the Tshwane Business Express encouraged them to find out more about it.

#### 4.5 SYNTHESIS OF QUALITATIVE FINDINGS

TBE users began using the service after hearing about it on radios or from other people who use it. The positive experiences from existing users and the promise of a good service through marketing campaigns made the service even more attractive. Other push factors such as increased fuel prices and road traffic congestion between the City of Johannesburg and the City of Tshwane were instrumental in their final travel mode choice decision. Subsequent to using the TBE service they are able to plan their day with more accuracy, and their quality of life has improved markedly, for example reduced stress levels and spending more time with family.

Asked first to generally describe how they would know if they are valued as customers in any service setting, participants mentioned the following variables as key: respect to customers, service reliability and empathic communication with customers. When asked to describe how they would know that they are valued as customers in a public transport setting, participants used their negative experiences to illustrate what they would not like to see happen to them to feel valued as public transport customers, confirming the assertions of the critical incident theory (Friman et al.,

2001) that negative incidents are strong memory triggers. Examples of lack of respect included “*poor treatment received from minibus taxis*”, because “*they talk to you any way they want*” and “*they don’t care about what you think or how you feel*”. Keeping promises as a service is valued by TBE non-users. Asked about the acceptable number of criminal incidents a month, participants said even one incident would stop them from using the transport service. Their personal cars are seen to offer security superior to that of any form of public transport. In fact, some TBE non-users thought there was no form of train service that could be secure irrespective of what it is called. In addition, TBE non-users thought their cars would not be safe if parked at a train station.

Participants associate the reliability of a transport service with their personal time management. An unreliable service could cost them “*clients*” and also disrupt their personal errand schedule. Reasonable explanation for poor service reliability is acceptable provided that it does not occur frequently. A frequently non-reliable service would stop them from using the transport service. TBE non-users do not believe there is any form of reliable public transport in South Africa. For TBE non-users, even roads are not reliable as a result of road traffic congestion.

TBE users did not regard safety, which includes malfunctioning of equipment, as a critical service variable. In fact a participant said, “*It never crossed my mind.*” Increased number of poor safety incidents would make them reconsider using the service. While TBE users were not concerned about current levels of safety on the train, they expressed the need for an on-board health and safety official. TBE non-users thought the train service must be safer than using the roads given its right of way, compared to their personal cars that share road space with heavy vehicles. In fact, TBE non-users think road traffic accidents are guaranteed.

TBE users did not have particularly strong feelings about air conditioning inside the train, and attribute this to lack of overcrowding inside the train. TBE non-users, on the other hand, thought air conditioning was “*very important*” because they “*do not want to get to work sweating*”. For TBE non-users even cars without fitted air conditioners allow the user to “*open the windows*”. Participants felt there are racial differences in response to weather conditions, where white people have a deeper tolerance of cold conditions than black people, and this often is a source of conflict. Another source of conflict is what is seen by black passengers as a seat reservation practice by white people in the train, in which the person(s) who normally sits adjacent to them uses the seat, and therefore cannot be occupied by a different person before the train departs. Seat reservation policy, in particular, is generally disliked by TBE users, in contrast to TBE non-users who welcome it.

Method of payment was seen as very important by both TBE users and non-users. TBE users were not satisfied with the current method of payment (cash only) and wished they could use electronic forms of payment, including credit cards and internet-based ticket sales. For users, carrying cash on one specific day to buy tickets (as is currently done) is seen as attracting criminals, and this is exacerbated by perceptions that “*business express people have a lot of money*”. Some TBE users reportedly miss their train service because of waiting in long ticket sales queues. With regard to

alternative payment methods, a TBE non-user participant said, *“It is important because as a working woman you don’t want to be standing in a queue as we have a lot of things to do. You leave office and you still have to fetch your kids, make supper for them and you still have meetings to attend, hence you don’t want to queue.”*

According to TBE users, an increased number of stops should not compromise the total travel time on the train. For TBE non-users speed of travel is important but they are unable to achieve acceptable levels on the road unless they either leave very early in the morning or much later, and even so, travel time is never guaranteed.

For TBE users, service frequency is not particularly a problem except for Fridays where they would like to have more services to accommodate early departures from work. In fact, on Fridays many TBE users opt to use their own cars instead of the train service. TBE non-users cited their often unpredictable schedules as a reason for the need for increased public transport service frequency.

An increased number of transfers would dissatisfy participants. For TBE users more than three transfers would be unacceptable, and if that happened they would stop using the service.

TBE users feel that for the price they pay for the service, standing passengers should not be allowed. Moreover, crowding is seen as creating poor security conditions. TBE non-users felt that in a crowded place you *“lose respect and dignity because other people push you around without even apologising”*.

TBE users evaluate the cleanliness of the service in its entirety, including the parking areas and station facilities. Both TBE users and non-users, however, thought cleanliness was the responsibility of passengers.

TBE users would consider to stop using the service if the staff becomes hostile, *“similar to those of taxis”*. Nonetheless, *“plastic smiles”* as opposed to *“real smiles”* are not appreciated. Moreover, TBE users expect to be greeted by hostesses, because *“in our culture when you find people in a room you greet them”*. The name *“business express”* is held in high regard by TBE non-users, and is likened to a professionally rendered service.

Mixing with people from different backgrounds is not seen as a problem. In fact, participants thought mixing with people from different backgrounds increased chances of meeting business associates. However, both TBE users and non-users vehemently expressed their dislike of *“untidy people”* or *“unhygienic people”* and would not want to sit next to them.

TBE users did not express strong sentiments about on-board entertainment, but where they thought it was important, they disagreed on the actual content which included different genres of music, news and sports. TBE non-users on the other hand regard on-board entertainment as *“very important”*, because it would allow them to *“listen to the news and business news”*. In fact, for one TBE non-user *“if newspapers are provided in public transport I will consider using it”*.

Interior furnishing that included cup holders, foldable tables, electric power point, and curtains to bar sunlight are appreciated by TBE users. Furthermore, TBE users cannot agree on the installation of toilets. There are three groups of participants: (i) Those who would like to have toilets given the one-hour journey length, (ii) those who want toilets on condition their number will be minimised or located in far-away compartments, and (iii) those completely against having on-board toilets on the grounds of foul smell and hygiene risks. For TBE users having self-service water points inside the train, especially in summer, would be appreciated. For some TBE users, removing hostesses, free newspapers and free beverages as part of the service would make them consider stop using the service.

For TBE users any form of fare increase should be supplemented by improved service, for example door-to-door shuttle services or increased service frequency, failing which they would consider stop using the service. Somewhat paradoxically, any service improvement is welcome as long as it does not affect the fare. Generally, any fare increase to above R1500 per month, from the current R750 monthly fare, would make TBE users consider alternative forms of transport, even though the total cost of using a car for the same journey costs more than R1500. TBE non-users had lower fare increase acceptance thresholds than those of TBE users.

Generally, both TBE users and non-users would rather have public transport services brought closer to their places of residence than moving closer to public transport facilities. Also, participants would rather change their workplaces than move their places of residence closer to work. The difficulty associated with moving place of residence was cited as the main reason for refusing to move their homes. Many of the participants living in the City of Tshwane said that, in principle, they would never want to live in the City of Johannesburg.

The ability to complain about the service, and see their complaints addressed, is seen as very important by TBE users. In fact, they regard the ability to complain as the one service attribute that they are now used to that they never thought was possible in public transport services. This is in contrast to keeping quiet when experiencing a bad service when using a minibus taxi in fear of being persecuted by the taxi driver or other service staff. However, TBE users had in the past complained about some aspect of the service, for example unavailability of shades for their cars and payment methods. The lack of positive response from TBE management in this regard is a source of much dissatisfaction. The TBE users also felt that the presence of a specific person to direct complaints to, as opposed to indirect communication methods, is better.

#### 4.6 **BENCHMARKING OF QUALITATIVE FINDINGS**

Customers' overall satisfaction depends on a large number of attributes, and the attributes tend to be traded off against one another. A price increase (non-inflationary) in particular creates expectations of improved service, without which customers become dissatisfied. It is only when specific, seemingly fundamental attributes are performing poorly, that customers consider not repurchasing or switching. For public transport services, in particular, service components beyond

on-board services form part of the service evaluation by customers. Customers have very low tolerance thresholds on the attribute security, most alluding that a single negative security incident is sufficient to make them switch travel modes.

Throughout the group sessions, both users and non-users relied largely on past negative incidents as memory triggers, confirming the relative strength of negative critical incidents. This confirms findings by Guiver (2007) who, through a discourse analysis that analyses the ordinary language people use when talking about a topic and infer meanings out of the discussions, shows that people generally describe public transport in a negative light and often consider themselves victims of the service. Repeated negative critical incidents in particular have a long-term effect on perceptions of service quality. In fact, customers are unlikely to remember specific critical incidents for a long time but more likely to remember those with higher frequencies (Friman et al., 2001). Customers' retrospective answers were triggered by the memory of negative incidents rather than positive ones, confirming the assertions of the critical incident theory (Friman et al., 2001) that negative incidents are strong memory triggers. For some respondents, the accumulated negative incidents had earlier pushed them to private transport. The responses also confirmed that, when using public transport, respondents have the goal to minimise dissatisfaction, and the attributes that were largely valued are affective in nature. Non-users were especially emphatic on what is required for them to start using the TBE service, indicating that it would take relatively more effort to get them to use TBE. Furthermore, unlike users, non-users used general experiences with public transport as opposed to TBE users to speculate on what they were likely to expect from TBE.

There appears to be many manifestations of dissatisfaction, and not all levels of dissatisfaction leads to loss of customers. This indeed shows that, in line with findings by Artis (2004), not all dissatisfaction leads to customers switching services or service providers

Non-users of public transport are responsive to marketing of public transport services. Many of the users indicated that they used the service because of the advertising of specific service incentives such as newspapers, on-board beverages, and guaranteed travel time. Many of the users got used to these incentives as an integral part of the service. This shows that incentive packages for passengers, while sometimes designed as short-term measures to attract passengers, are over time seen as an integral part of the service by customers. Once they are removed, they can be the source of intense customer dissatisfaction and may lead to loss in the customer base. If the incentives are temporary, they need to be communicated clearly and continuously as temporary measures. Also, by emphasising that the operator should deliver on the promise made through marketing campaigns shows that indeed marketing serves to create a strong sense of expectation. This implies that marketing campaigns should be used as reference points when applying gap-based models of customer satisfaction. This is especially important because, as shown in the qualitative survey results, respondents are unable to coherently specify what they want. Therefore measuring expectations with the view of obtaining a gap between expectations and perceptions, as required in gap models, will not be straightforward.

For TBE users, continuing to use public transport was as a result of the TBE public transport service practically showing net benefits to the respondents, for example, travel time savings and predictability of travel time. However, switching public transport does not imply that they never have to use their personal cars. When public transport does not meet specific travel requirements for a specific day, TBE users resort to using their cars. In this way public transport is seen as a service that must complement the lifestyle already chosen as opposed to requiring lifestyle to be adjusted to be compatible with public transport, a point also expressed by the non-users. While existing users are not completely satisfied with the TBE service, they continue to use it. This is further confirmation of an attribute trade practice.

#### 4.7 SUMMARY

Qualitative surveys generally have the benefit of providing in-depth understanding of the phenomenon being studied. It was shown how these surveys are able to profile and contrast the needs of users and non-users of public transport in order to facilitate matching their requirements to service design. It was, however, shown through the qualitative surveys that there are diverse needs among both users and non-users of public transport, even for a niche market surveyed with essentially a single trip purpose. Therefore service designs that are not informed by in-depth market studies are bound to create mismatches between customer requirements and the actual service, shown to be one of the major sources of customer dissatisfaction in services.

It was shown that everyone is a potential public transport user. What users want are public transport services that match their travel requirements. With proper marketing non-users can become users. Nonetheless, using public transport at any given time does not necessarily imply that the users have completely switched travel modes, as users choose to travel in a manner that is most convenient to them. Under these circumstances the role of public transport is that of providing a viable travel alternative as and when required.

While marketing does draw non-users to the service, promises made through marketing campaigns must be kept. These promises are used as reference points when evaluating service quality and, as shown in other service research literature, such gaps can be a source of major customer dissatisfaction. Therefore, incentive packages for passengers, while sometimes designed as short-term measures to attract passengers, are over time seen as an integral part of the service by customers. Once they are removed, they can be the source of intense customer dissatisfaction and lead to loss in the customer base. If the incentives are temporary, they need to be communicated clearly and continuously as temporary measures.

Public transport fares are used as an indicator for service quality, where increased fares are expected to be supplemented by improved services. Also, users are suspicious of service improvements in that such improvements may attract increased fares.

While public transport is acknowledged as being cheaper than private transport, cost on its own is insufficient to cause mode shift. Non-users have preconceived judgements about public transport

that are informed by historical negative critical incidents with public transport. Negative critical incidents indeed form strong decision-making references. Beirao (2007), for example, found that non-users felt that by using public transport they would be unable to predict journey times because of the unreliability of public transport. Therefore, to compensate for the poor reliability of the services they believe the user would need to arrive much earlier resulting in much longer journey times. This further confirms, as shown in the current research, that marketing of public transport needs to be implemented as a complete service and not isolated attributes such as fare levels. Also, users evaluate the service as a whole and not just the lengthy part of the journey. Aspects such as park-and-ride facilities and shuttle service form part of the total service evaluation.

## 5 QUANTITATIVE DATA COLLECTION

### 5.1 INTRODUCTION

Following the analysis of the qualitative survey data in the previous chapter, quantitative surveys were carried out in order to provide data enabling the exploration of the quantitative relationship between public transport service quality and customer satisfaction. This chapter describes the data collection process, including instrument design and the interpretation of the survey data.

### 5.2 SURVEY DESIGN AND SAMPLING PROCEDURE

Given the desirable mathematical features of the relationship between public transport service quality and customer satisfaction as well as the categorical nature of data structures relating to customer satisfaction, conjoint analysis was deemed the most appropriate approach to the design of a survey instrument. Conjoint analysis is a multivariate data analysis that allows for the estimation of relationships between dependent and independent variables in which the dependent variable can either be a metric or non-metric measure, and the independent variables are non-metric (Hair et al., 2006). Other attractive features of conjoint analysis are that the effect of each level is estimated separately and it therefore does not assume that the levels are related; that they can be used to estimate both linear and non-linear relationships, and that the types of relationships can vary between attributes. The method has found a wide range of applications that include (Gustafsson et al., 2007): (i) new product planning, (ii) improvement of existing products and services, (iii) pricing policies, (iv) advertising and (v) market segmentation. Conjoint analysis is effective for modelling how customers combine the values of individual attributes into the overall evaluation of a service or product. Three types of conjoint analyses can be undertaken, namely: (i) rating, (ii) ordering and (iii) choice-based analysis. The rating alternative allows a respondent to rate a collective set of attributes, while the ordering alternative allows the respondent to order sets of attributes in terms of personal preference, and the choice alternative allows the respondent to choose preferred packages of attributes among alternatives.

For the purpose of this experiment, a rating-based conjoint analysis was selected. This option allowed for the design of a number of service packages that are essentially hypothetical packages of service attributes that could be offered on the Tshwane Business Express (TBE). The sampling frame comprised the users of the TBE on the one hand, who were randomly selected from the train coaches, and non-users of the TBE on the other hand, sharing the same trip origins and destinations as the TBE users, sourced from a pre-existing database of a market research firm.

The attributes and attribute levels are summarised in Table 5.1. The selection of attributes and attribute levels was informed mainly by the results of the qualitative survey. For each service attribute, the attribute levels used are listed together with the attribute level design codes. Furthermore, the attributes are pre-classified for further testing; in terms of the Kano model



attribute groups, where for example service reliability is pre-classified as a basic attribute, service frequency as a performance attribute and payment convenience as an excite attribute.

**Table 5.1: Attribute and attribute levels used in the experiment**

Service attribute	Hypothesised attribute type	Attribute levels
Reliability	Basic	1: Always departs and arrives on time
		2: Occasionally departs or arrives 10 minutes late
		3: Occasionally departs or arrives 30 minutes late
Staff respect	Basic	1: All staff respectful
		2: Some staff respectful
		3: All staff not respectful
Security	Basic	1: No criminal incidents
		2: Five (5) criminal incidents reported per month
		3: Ten (10) criminal incidents reported per month
Frequency of service	Performance	1: One (1) train per day per direction
		2: One (1) train service every hour
		3: Three (3) train services every hour
Climate control	Performance	1: Comfortable temperature
		2: Slightly uncomfortable temperature
		3: Extremely uncomfortable temperature
Information quality	Performance	1: Timetables and changes to service communicated timely
		2: Timetables and changes to service communicated poorly
		3: No timetable information and no changes to service communicated
Payment convenience	Excite	1: Debit card, credit card or internet to pay for tickets in addition to cash any time of month
		2: Cash payment only, inside train and at booth any day of month
		3: Cash payment only, at payment booth one day per month
Hostess service	Excite	1: Hostess per coach to serve refreshments and respond to your concerns
		2: No hostess but with self-service on refreshments
		3: No hostess and no refreshments
Newspapers	Excite	1: Newspapers of choice provided to individual passengers
		2: Newspapers shared between passengers
		3: No newspapers provided
Fare	Not applicable; Used to facilitate trade-offs	1: The current R750 per month
		2: Equal to half the cost of travelling by car
		3: Equal to the cost of travelling by car

In order to reduce the respondent burden, the number of attributes per respondent were limited to 7 by dividing the attributes into two designs as shown in Table 5.2. Wittink et al., (1992) and Hair et al., (2006) propose limiting the number of attributes to six, but Hair et al., (2006) also report up to 10 attributes for certain types of design.

Each design has the minimum number of service packages to ensure orthogonality, with main effect only, resulting in 18 service packages. For control purposes, the designs shared a number of attributes that include reliability, payment convenience and service frequency. The instruments were piloted and were adjusted particularly in terms of how the surveyors should explain technical terms such as service frequency to the respondents. TBE users and non-users were exposed to both designs.

**Table 5.2 Service package designs**

Design 1								Design 2							
Package Number	Reliability	Payment convenience	Frequency of service	Newspapers	Climate control	Staff respect	Fare	Package Number	Reliability	Payment convenience	Frequency of service	Hostess service	Information quality	Security	Fare
1	3	3	1	1	2	2	2	1	3	3	1	1	2	2	2
2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
3	3	2	1	3	1	1	3	3	3	2	1	3	1	1	3
4	2	1	1	2	3	2	3	4	2	1	1	2	3	2	3
5	3	1	2	2	3	1	2	5	3	1	2	2	3	1	2
6	1	3	2	2	1	2	1	6	1	3	2	2	1	2	1
7	2	3	1	3	3	3	1	7	2	3	1	3	3	3	1
8	3	2	2	1	3	3	1	8	3	2	2	1	3	3	1
9	1	1	2	3	2	3	3	9	1	1	2	3	2	3	3
10	1	2	3	1	3	2	3	10	1	2	3	1	3	2	3
11	3	3	3	2	1	3	3	11	3	3	3	2	1	3	3
12	2	1	3	1	1	3	2	12	2	1	3	1	1	3	2
13	1	3	3	3	3	1	2	13	1	3	3	3	3	1	2
14	3	1	3	3	2	2	1	14	3	1	3	3	2	2	1
15	2	2	3	2	2	1	1	15	2	2	3	2	2	1	1
16	1	2	1	2	2	3	2	16	1	2	1	2	2	3	2
17	2	2	2	3	1	2	2	17	2	2	2	3	1	2	2
18	2	3	2	1	2	1	3	18	2	3	2	1	2	1	3

The quantitative questionnaire flow is summarised in Figure 5.1, and essentially comprises four main sections, namely (i) identification of respondent, (ii) respondent demographic profile, (iii) respondent's commuting trip profile, and (iv) the evaluation of service packages. An example of the evaluation of service packages component is shown in Figure 5.2. For each service package respondents had to provide a rating scale of 0 to 10, in line with their levels of satisfaction with the individual packages, and also had to indicate how the rating would translate into travel mode choice. An additional open-ended question probing the reasons for choices made in each service

package ensured that respondents applied their minds to their choices, and also provided additional contextual information for analysis purposes.

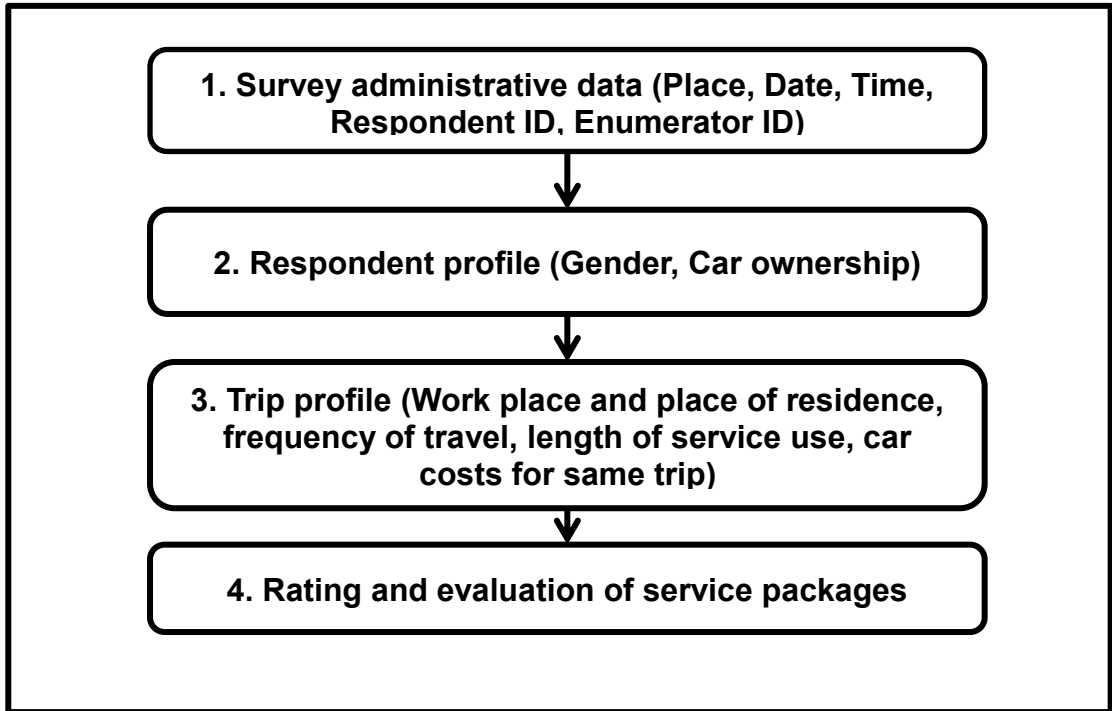


Figure 5.1: Overall structure of the quantitative survey questionnaire

Reliability	Occasionally departs or arrives 30 minutes late											
Payment convenience	Cash payment only, at payment booth one day per month.											
Frequency of service	One train per day per direction											
Newspapers	Newspapers of choice provided to individual passengers											
Climate control	Slightly uncomfortable temperature											
Staff respect	Some staff respectful											
Fare	Equal to half the cost of travelling by car											
<b>From a scale of 0 (least satisfied) to 10 (most satisfied) how would you be satisfied with this service package? (Tick number)</b>												
<b>Least satisfied</b> <span style="float: right;"><b>Most satisfied</b></span>												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">0</td> <td style="width: 10%;">1</td> <td style="width: 10%;">2</td> <td style="width: 10%;">3</td> <td style="width: 10%;">4</td> <td style="width: 10%;">5</td> <td style="width: 10%;">6</td> <td style="width: 10%;">7</td> <td style="width: 10%;">8</td> <td style="width: 10%;">9</td> <td style="width: 10%;">10</td> </tr> </table>		0	1	2	3	4	5	6	7	8	9	10
0	1	2	3	4	5	6	7	8	9	10		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Yes, I will continue to use the service</td> <td style="width: 33%;">No, I will use my car</td> <td style="width: 33%;">I am undecided</td> </tr> </table>		Yes, I will continue to use the service	No, I will use my car	I am undecided								
Yes, I will continue to use the service	No, I will use my car	I am undecided										
<b>Main reasons for your decisions:</b>												

Figure 5.2: Example of options evaluations component of the questionnaire

### 5.3 SAMPLE DESCRIPTION

The total sample comprised 64 respondents with the split as follows: 21 TBE users and 12 non-users for design 1, and 19 TBE users and 12 non-users for design 2. The survey therefore yielded 1 152 observations of service package ratings. Each respondent was asked to rate 18 profiles, which was the minimum number of profiles necessary for an orthogonal design for the current experiment. While it has been argued that an increased number of profiles may have the tendency to create respondent fatigue (Bradley and Daly, 1994), this is dismissed by Hess et al., (2012) as insignificant, particularly for the size of the current experiment, and given the general familiarity of the respondents with the service attributes. Del Mistro and Arentze (2002) show statistical insignificance of respondent fatigue from increased number of profiles among both literate and less literate respondents in the South African context.

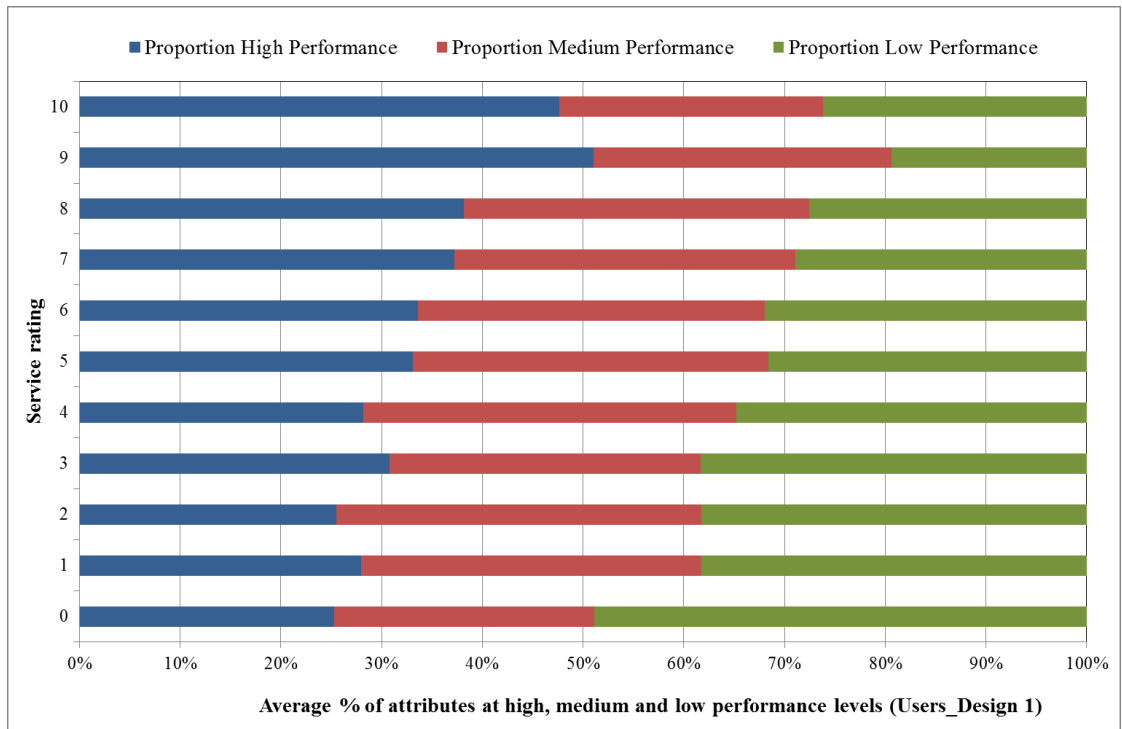
The sample is profiled in Table 5.3 in terms of gender, travel frequency and the period over which the respondent has been travelling. There are relatively more females than males in the user group in contrast to slightly more males than females in the non-user group. Most of the respondents travel five days or more per week in a similar manner, confirming the respondents as commuters. Furthermore, over two-thirds of the respondents have been travelling by TBE and car respectively for over six months. A sizable proportion of respondents, amounting to about a fifth of total respondents, have only been travelling by their respective modes for less than a month. Both TBE users and non-users report an inclusive total costs of using a personal car between R1 000 and R4 000 per month for the same trip, with an average of R2 052, compared to the TBE fare of R750 per month. The sample therefore comprises respondents that can be considered commuters who are fairly familiar with the travel conditions in the corridor.

**Table 5.3: Sample profile**

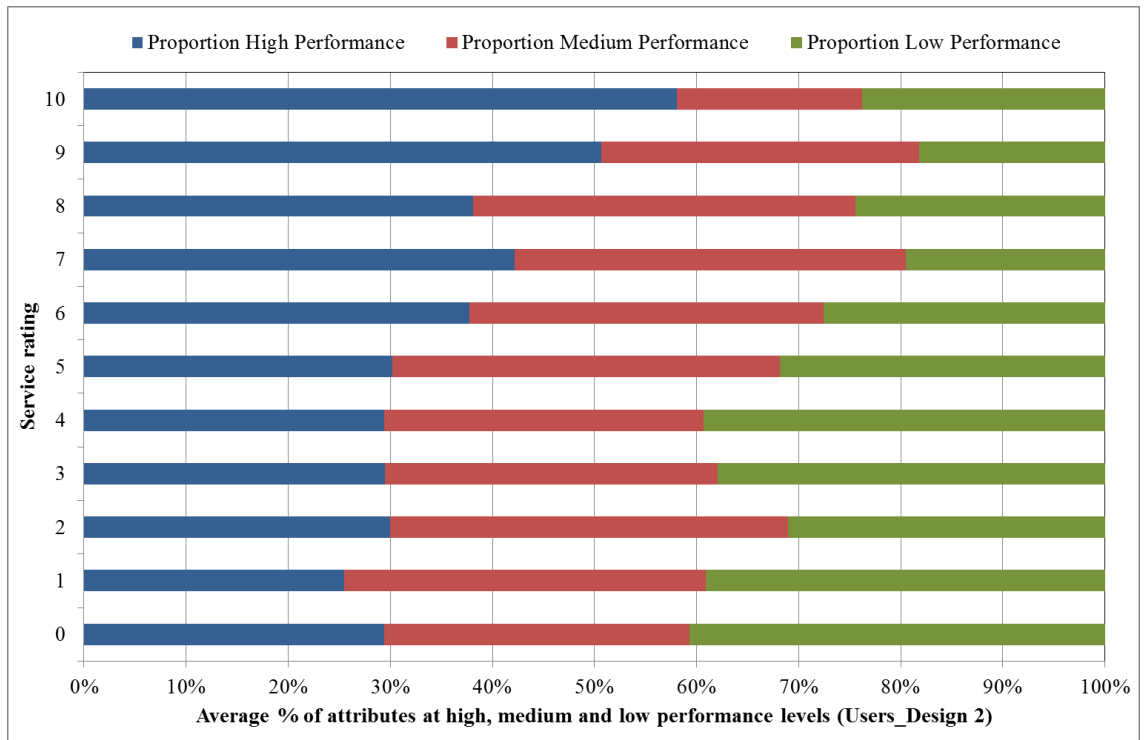
Attribute	Users		Non-users		Total
	Design 1	Design 2	Design 1	Design 2	
<b>Gender</b>					
<b>Male</b>	35%	56%	67%	46%	<b>51%</b>
<b>Female</b>	65%	44%	33%	54%	<b>49%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Travel frequency</b>					
<b>5 or more days per week</b>	80%	83%	90%	100%	<b>88%</b>
<b>2 to 4 days per week</b>	5%	0%	10%	0%	<b>4%</b>
<b>Once a week</b>	0%	0%	0%	0%	<b>0%</b>
<b>Occasionally</b>	15%	17%	0%	0%	<b>8%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>When started travelling this way</b>					
<b>Less than a month ago</b>	5%	23%	9%	23%	<b>18%</b>
<b>2 to 6 months ago</b>	35%	8%	9%	8%	<b>15%</b>
<b>More than 6 months ago</b>	50%	69%	82%	69%	<b>68%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## 5.4 ANALYSIS OF SURVEY RESULTS

Figures 5.3 and 5.4 show the relationship between service satisfaction ratings and the proportion of attributes in the service package, which could be referred to as high, medium and low performance for TBE users. As the proportion of low performance attribute levels rise, the satisfaction ratings tend to reduce. Similarly, when the proportion of high performance attribute levels increases, the customer satisfaction ratings also increase. Of importance is to note that respondents are able to rate the services high even with a significant proportion of poor performance attribute levels. This confirms that services can receive high customer satisfaction ratings even when they contain a significant proportion of low performance attribute levels. It is also worth noting that TBE users were able to rate the same service using different service packages. This confirms that once a service is defined and communicated accordingly to the customers, the customers are empowered to have a reference point for evaluating the service performance.



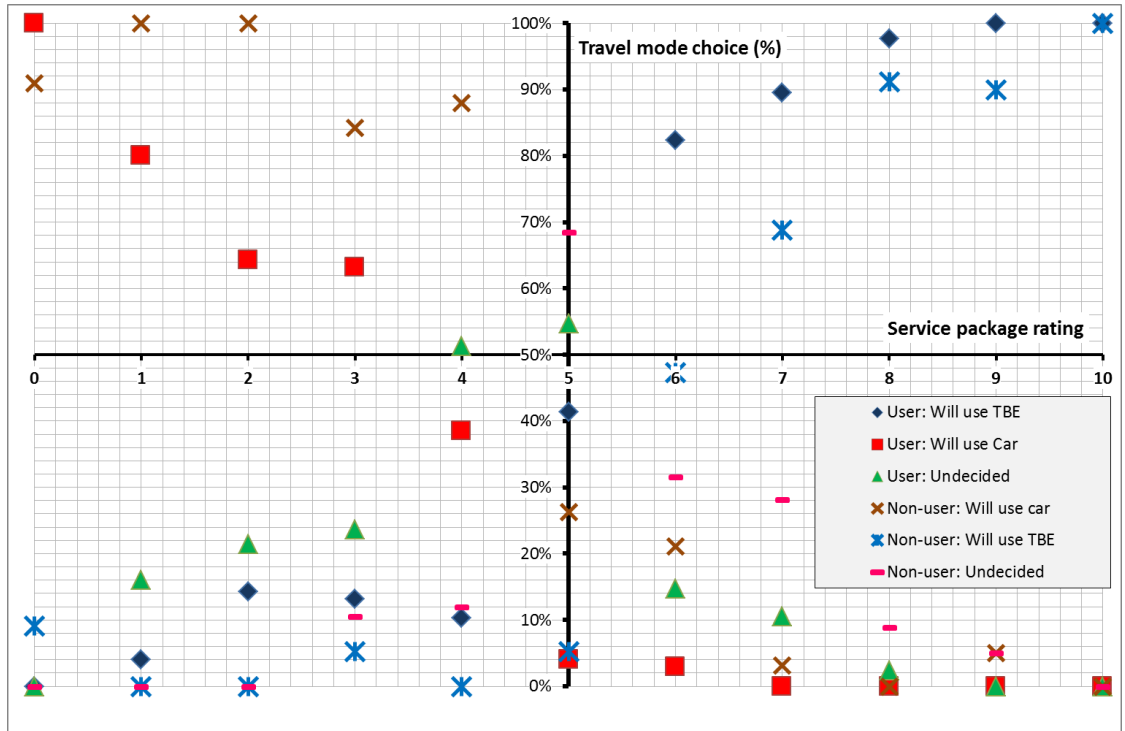
**Figure 5.3: Service package ratings and attribute level performances by TBE users for service design 1**



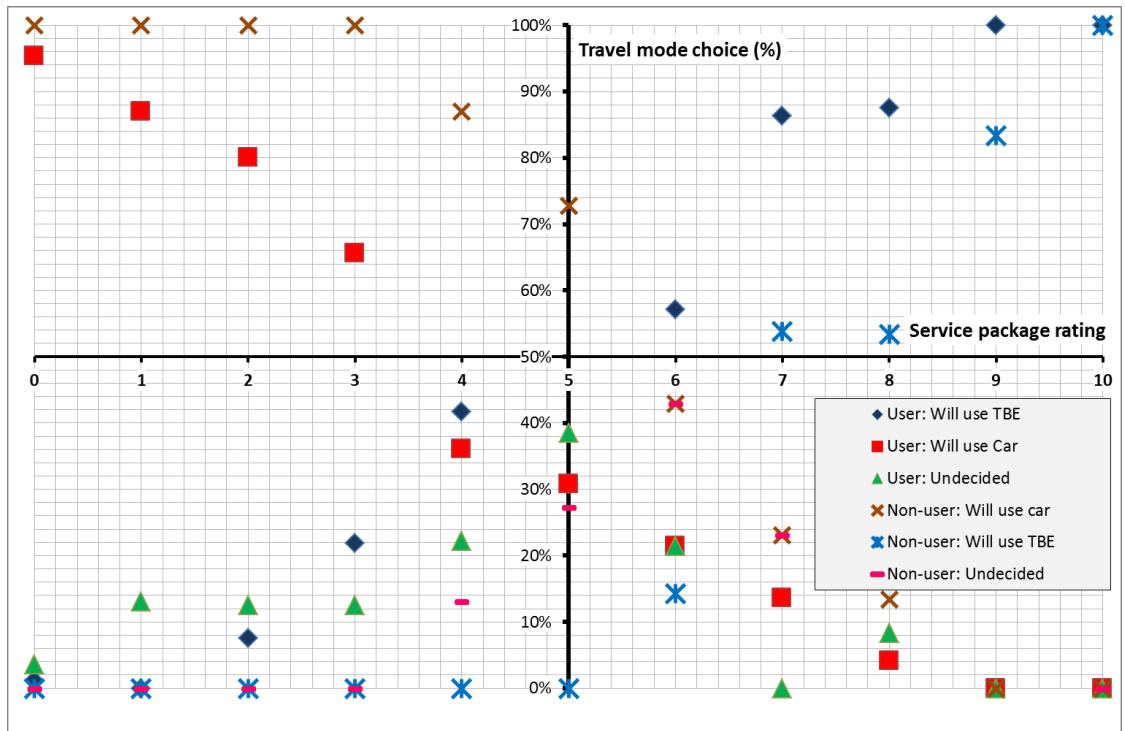
**Figure 5.4: Service package ratings and attribute level performances by TBE users for service design 2**

Figures 5.5 and 5.6, derived from the quantitative survey questionnaire results, show the relationship between respondents' satisfaction ratings and the decisions related to travel mode choice for both service designs, including the level of mode choice uncertainty expressed in the form of "undecided". The relationship shows indeed that the higher the customer satisfaction with a service, the more likely they are to continue to use TBE or switch to using TBE in the case of non-users. However, it is noted that TBE non-users seem to be harder to please than existing users in that a mode shift to TBE takes place at relatively higher service ratings. This implies that attracting non-users of public transport services requires relatively more effort than retaining existing users. This further implies that all else being equal, increasing customer patronage, relative to other transport modes, can be used as a surrogate measure for improved service quality, especially in cases where travel alternatives exist. Therefore, in the context of performance-based contracts, increased patronage should be rewarded. The relationship between customer satisfaction and mode choice could therefore also be used for the more objective computation of the relative impact of changes in service quality.

Of further note in Figures 5.5 and 5.6 is that non-users are indeed responsive to public transport service design, implying that services can be designed in a manner that attracts them, albeit at seemingly higher costs. A conclusion can be drawn therefore that the voice of the non-user should also be incorporated into the contract design in order to meaningfully facilitate increased patronage, in line with the overall objective of public transport.



**Figure 5.5: The relationship between customer satisfaction and mode choice for TBE users and non-users responding to design 1 service packages**



**Figure 5.6: The relationship between customer satisfaction and mode choice for TBE users and non-users responding to design 2 service packages**

Table 5.4 illustrates how TBE users rated the different service packages in terms of the length of time they have been using the service. For each service package listed, the average service rating for respondents who have been using the service for less than a month, between two (2) and six (6) months, as well as more than six (6) months are provided for each service design. For comparative purposes the average ratings are normalised to the “less than a month” user group. A t-test performed on the data shows that there is a significant difference between the group that has only recently started to use the service and the groups that have been using the service for a longer period. It appears in longer term that users tend to be more tolerant than newer customers, who tend to have relatively more stringent demands.

**Table 5.4: TBE user service package rating differences in terms of period over which TBE service has been used**

Service Package	Design 1			Design 2		
	Less than a month	2 to 6 months	More than 6 months	Less than a month	2 to 6 months	More than 6 months
1	1.0	0.9	0.7	1.0	5.0	3.9
2	1.0	1.0	0.9	1.0	0.8	0.9
3	1.0	0.9	0.7	1.0	2.7	1.0
4	1.0	1.7	1.5	1.0	3.0	2.6
5	1.0	1.1	1.2	1.0	4.5	2.8
6	1.0	0.8	0.9	1.0	1.8	1.2
7	1.0	1.3	1.4	1.0	3.1	1.3
8	1.0	1.5	1.5	1.0	14.0	5.5
9	1.0	1.0	0.7	1.0	4.5	3.1
10	1.0	0.9	1.1	1.0	2.1	1.5
11	1.0	1.5	1.8	1.0	2.8	1.3
12	1.0	1.4	1.5	1.0	9.5	4.3
13	1.0	0.9	0.9	1.0	3.8	2.1
14	1.0	1.5	1.3	1.0	1.9	1.0
15	1.0	1.1	1.4	1.0	0.9	0.6
16	1.0	0.8	0.8	1.0	3.6	1.7
17	1.0	1.6	1.4	1.0	2.4	1.8
18	1.0	1.7	1.5	1.0	2.0	1.3
<b>t-statistic relative to expected t_critical= 2.11 (Df=17, <math>\alpha=0.05</math>)</b>	-	2.73	2.29	-	3.69	3.50



## 5.5 SUMMARY

The qualitative survey results informed the design of the quantitative survey instruments. A conjoint analysis framework was used given its flexibility in respect of facilitating the estimation of quantitative relationships between ordinal dependent and independent variables, and without assuming a response surface.

The sampling frame comprised the users and non-users of the TBE service sharing similar trip origins and destinations. The attributes and attribute levels comprised both conventional and non-conventional public transport attributes allowed by the nature of the TBE service.

It was shown that:

- a) Both users and non-users are sensitive to service designs.
- b) Services can be rated very high even when some attributes comprising the service are at low performance levels.
- c) When a package of attributes is defined as a service, respondents are able to apply their minds to evaluate the performance of the service without needing extra information on the attributes outside the service package.
- d) Non-users appear more difficult to please than current TBE users.
- e) The length of time a user has used the service affects service evaluations, where recent users tend to have higher satisfaction thresholds.
- f) All else being equal, it appears that increased customer patronage, relative to other transport modes, can be used as a surrogate measure for improved service quality, especially in cases where travel alternatives exist.

## 6 CUSTOMER SATISFACTION MODEL ESTIMATION

### 6.1 INTRODUCTION

This chapter explores alternative ways of using the results of the quantitative survey to estimate customer satisfaction related models that are suitable for informing how customer satisfaction should be specified in public transport contracts.

### 6.2 MODEL STRUCTURE

The conjoint analysis framework selected for the collection of field data also formed the basis for the estimation of the relationship between service quality and customer satisfaction. The framework was chosen on the basis of its flexibility, especially in the light of customer satisfaction having been shown to generally have an asymmetric non-linear relationship with service quality. Furthermore, the framework allows for use of ordinal variables as both dependent and independent variable. The generalised form of the model is presented as Equation 6.1:

$$S = \sum_1^i \sum_1^{j_i} (\beta_{ij_i} X_{ij_i}^{n_{ij_i}}) + \lambda \quad \dots \text{Equation 6.1}$$

Where:

$S$  = Overall customer satisfaction

$X_{ij_i}^{n_{ij_i}}$  = Attribute level  $j_i$  for attribute  $i$

$\beta_{ij_i}$  = Coefficient associated with attribute level  $X_{ij_i}^{n_{ij_i}}$

$n_{ij_i}$  = the exponent associated with attribute level  $X_{ij_i}^{n_{ij_i}}$

$\lambda$  = constant

The model structure shows satisfaction as an additive function of a combination of service attributes levels, and not just attributes. The additive function is in line with the view that customers rate service as a package of attributes and not just individual attributes. Furthermore, the effect of attribute levels on customer satisfaction is generalised as non-linear.

### 6.3 MODEL ESTIMATION

The conjoint analysis model parameters were estimated using ordinal multiple regression. The regression technique essentially estimates the cumulative probability of an outcome where the outcome is an ordinal variable (ordered variable with an arbitrary scale), and assumes that the

effects of explanatory variables are proportional across the outcomes (proportional odds assumption) (Tutz, 2012). The coefficients are then estimated by solving a proportional odds model. Given that in Equation 6.1, only one attribute level can feature at any given time for a particular service with a value of 1, the value of  $n_{ij_i}$  becomes irrelevant. Therefore, the values of  $\beta_{ij_i}$  remain the only indicators of the strength of the impact of the individual attribute levels on satisfaction. The results of the regression are summarised in Tables 6.1 and 6.2 for design 1 and design 2 respectively. For each attribute level, the coefficient  $\beta_{ij_i}$  and  $p$ -value are provided.

Across all the profiles, the intercept value represents the respondents' rating of the best possible service corresponding to zero dummy values for other attribute levels. The signs of the coefficients are indicative of the directional effect of the attribute level on customer satisfaction, where negative values indicate an inverse relationship.  $P$ -values of more than 0.05 are indicative of the statistical insignificance of the coefficients at 95% significance level. In this regard, the following attributes have some levels deemed to have relatively insignificant impact on customer satisfaction. For users these are: staff respect, frequency of service and fare. For non-users these are: staff respect, frequency of service, climate control, payment convenience, newspapers, and hostess service. High levels of insignificance are detected, particularly for users in respect of payment method and hostess service. A relatively high intercept implies that their satisfaction may be explained by parameters other than the ones included in the model. This is expected, since the attributes chosen for modelling purpose were out of the many other attributes that were expressed by respondents in the focus groups. Estimating the parameters with a zero intercept, while it would improve the model fit, would compromise the reliability of the model.

The following are nonetheless notable from Tables 6.1 and 6.2 about the service attributes:

- a) Reliability: Both users and non-users are intolerant of unreliable services. At more extreme values of poor service reliability, non-users become relatively more dissatisfied.
- b) Security: Both users and non-users are intolerant of poor security. At more extreme values of poor security, non-users become relatively more dissatisfied. This confirms findings from the qualitative surveys which suggest that a slight compromise in security will result in an immediate mode switch for the market segment under consideration.
- c) Staff respect: It is only at extreme values of perceived staff disrespect that both users and non-users become significantly dissatisfied.
- d) Frequency of service: Non-users are more sensitive to improved service frequency than users. The insignificance on user satisfaction may be that users have become accustomed to one service per direction per day.

- e) Climate control: Users appear to be more sensitive than non-users to climate control. From focus groups, speaking from experience, different users indicated that temperature tends to be very hot in summer and very cold in winter.
- f) Payment convenience: Users are generally more sensitive than non-users to payment methods. From focus groups, users expressed the logistical difficulties with regard to current payment methods.
- g) Newspapers: When newspapers are not provided altogether, users become significantly dissatisfied. Non-users appear not to be concerned about the provision of newspapers.
- h) Hostess service: Hostesses become a significant issue to users if they are not provided. Non-users are not concerned about the provision of hostesses.
- i) Information quality: Only at high poor levels of information quality do users and non-users become significantly dissatisfied, indicating that information about services is taken for granted until it is not available.
- j) Fare: Both users and non-users are sensitive to fare increases. In fact, both users and non-users expect the monetary cost of using public transport to be lower than the cost of using a car.

**Table 6.1: Parameter estimation for users and non-users for design 1**

Attribute	Attribute level	Coefficient		p-value	
		Users	Non-Users	Users	Non-Users
Intercept		6.346	7.179	<.0001	<.0001
Reliability	Occasionally departs or arrives 10 minutes late	-0.560	-0.364	0.0003	0.0380
	Occasionally departs or arrives 30 minutes late	-0.531	-0.525	0.0005	0.0029
Staff respect	Some staff respectful	0.090	-0.188	0.5553	0.2823
	All staff not respectful	-0.294	-0.499	0.054	0.0046
Frequency of service	One train service every hour	0.288	-0.106	0.0591	0.5438
	Three train services every hour	0.203	-0.063	0.1834	0.7171
Climate control	Slightly uncomfortable temperature	-0.435	-0.031	0.0046	0.8583
	Extremely uncomfortable temperature	-0.673	-0.449	<.0001	0.0106
Payment convenience	Cash payment only, inside train and at booth any day of month	-0.542	-0.169	0.0004	0.3324
	Cash payment only, at payment booth one day per month.	-0.316	-0.036	0.0390	0.8379
Newspapers	Newspapers shared between passengers	-0.307	0.000	0.0447	0.9998
	No newspapers provided	-0.596	-0.090	0.0001	0.6043
Fare	Equal to half the cost of travelling by car	-0.006	-0.807	0.9686	<.0001
	Equal to the cost of travelling by car	-0.707	-1.543	<.0001	<.0001
<b>Sample size</b>		21	12		
<b>Number of rating observations</b>		378	216		
<b>R<sup>2</sup></b>		0.22	0.35		

**Table 6.2: Parameter estimation for users and non-users for design 2**

Attribute	Attribute level	Coefficient		p-value	
		Users	Non-Users	Users	Non-Users
Intercept		6.287	5.861	<.0001	<.0001
Reliability	Occasionally departs or arrives 10 minutes late	-0.623	-0.102	0.0004	0.6429
	Occasionally departs or arrives 30 minutes late	-0.799	-1.025	<.0001	<.0001
Security	5 criminal incidents reported per month	-0.504	-0.835	0.004	0.0002
	10 criminal incidents reported per month	-1.164	-1.487	<.0001	<.0001
Frequency of service	1 train service every hour	-0.369	0.541	0.0342	0.015
	3 train services every hour	-0.307	0.482	0.0779	0.0301
Payment convenience	Cash payment only, inside train and at booth any day of month	-0.340	-0.183	0.0511	0.4083
	Cash payment only, at payment booth 1 day per month.	-0.327	-0.249	0.0602	0.2598
Information quality	Timetables and changes to service communicated poorly	-0.281	-0.349	0.1062	0.115
	No timetable information and no changes to service communicated	-0.759	-0.471	<.0001	0.0341
Hostess service	No hostess but with self-service on refreshments	-0.298	0.013	0.0866	0.9527
	No hostess and no refreshments	-0.653	-0.325	0.0002	0.1428
Fare	Equal to half the cost of travelling by car	-0.615	-0.615	0.0005	0.0058
	Equal to the cost of travelling by car	-0.978	-0.784	<.0001	0.0005
<b>Sample size</b>		19	12		
<b>Number of rating observations</b>		342	216		
<b>R<sup>2</sup></b>		0.31	0.34		

The results of the two designs were combined to a single model using the bridging design methodology developed by Francois and MacLachlan (1999) for conjoint analysis. In terms of this technique, the parameters from the overlapping attributes from two designs are used to rescale the combined model in the following way: Given  $n$  overlapping attributes,  $R_{ij}$  and  $R_{ik}$  are the ranges of coefficients for overlapping attribute  $i$ , in designs  $j$  and  $k$ , and the bridging scalar  $B$  is estimated as the ratio of the sum of ranges of coefficients in design  $i$  and design  $k$ , as follows:

$$B = \frac{\sum_{i=1}^{i=n} R_{ij}}{\sum_{i=1}^{i=n} R_{ik}} \quad \dots \text{Equation 6.2}$$

The scaled overlapping coefficient  $u_{ij}$  for attribute  $i$  becomes  $B^{-1} \cdot u_{ij} + B \cdot u_{ik}$ , and the non-overlapping coefficient  $u_{ij}$  for attribute  $i$  in design  $j$  becomes  $B^{-1} \cdot u_{ij} + u_{ij}$ . For design  $k$  the the non-overlapping coefficient for design  $k$  becomes  $B \cdot u_{ik} + u_{ik}$ . The resulting model is improved with increased number of bridging attributes, and also by using attributes that are likely to have high relative importance (Francois and MacLachlan, 1999).

The coefficients from the two designs were bridged accordingly and are presented in Table 6.3. The results in Table 6.3 therefore represent the response of the market to the service as a whole. Using the parameters in this table, various permutations of the services, in terms of attribute values, can be assessed in terms of relative impact on satisfaction for both existing and potential customers.

The relative importance of the service attributes are computed in Table 6.4. For each attribute  $i$  with level coefficients  $u_i$ , the range of the coefficient values ( $u_{i\max} - u_{i\min}$ ) was normalised to the sum of the ranges  $\sum_{i=1}^{i=n} (u_{i\max} - u_{i\min})$  from all the  $n$  attributes in the service package (Hair et al., 2006). For users security appears to be the most important attribute in contrast to non-users whose most important attribute is cost.

For both users and non-users, security is the most important service attribute. Staff respect is the least important attribute for users in contrast to newspaper provision for non-users. The low impact shown by service frequency may be an indication that once a service level has been communicated, in this case timetable, customers accept it as long as it serves their purpose, in this case commuting. The high impact of security is a confirmation of the results of the qualitative survey findings that poor public transport security alone is sufficient to create mode switching, especially those with travel mode alternatives.

**Table 6.3: Combined model parameters**

Attribute	Attribute level	Coefficients	
		User	Non-User
Intercept		16.55	12.23
Reliability	Always departs and arrives on time	0	0
	Occasionally departs or arrives 10 minutes late	-1.61	-0.49
	Occasionally departs or arrives 30 minutes late	-1.98	-1.51
Staff respect	All staff respectful	0	0
	Some staff respectful	0.13	-0.39
	All staff not respectful	-0.43	-1.05
Frequency of service	1 train per day per direction	0	0
	1 train service every hour	1.93	1.33
	3 train services every hour	-0.57	0.37
Climate control	Comfortable temperature	0	0
	Slightly uncomfortable temperature	-0.64	-0.07
	Extremely uncomfortable temperature	-0.98	-0.94
Payment convenience	Debit card, credit card or internet to pay for tickets in addition to cash any time of month	0	0
	Cash payment only, inside train and at booth any day of month	-0.99	-0.35
	Cash payment only, at payment booth one day per month	-0.85	-0.27
Newspapers	Newspapers of choice provided to individual passengers	0	0
	Newspapers shared between passengers	-0.45	0.00
	No newspapers provided	-0.87	-0.19
Fare	The current R750 per month	0	0
	Equal to half the cost of travelling by car	-1.33	-1.45
	Equal to the cost of travelling by car	-2.45	-2.41
Security	No criminal incidents	0	0
	5 criminal incidents reported per month	-1.60	-1.59
	10 criminal incidents reported per month	-3.68	-2.84
Information quality	Timetables and changes to service communicated timely	0	0
	Timetables and changes to service communicated poorly	-0.89	-0.67
	No timetable information and no changes to service communicated	-2.40	-0.90
Hostess service	Hostess per coach to serve refreshments and respond to your concerns	0	0
	No hostess but with self-service on refreshments	-0.94	0.03
	No hostess and no refreshments	-2.07	-0.62

**Table 6.4: Estimation of relative importance of attributes for users and non-users**

Attribute	User	Non-user
<b>Reliability</b>	11%	12%
<b>Payment convenience</b>	6%	3%
<b>Frequency of service</b>	11%	11%
<b>Newspapers</b>	5%	2%
<b>Climate control</b>	6%	8%
<b>Staff respect</b>	2%	9%
<b>Hostess service</b>	12%	5%
<b>Information quality</b>	14%	7%
<b>Security</b>	21%	23%
<b>Fare</b>	14%	20%

Within the context of the Kano model presented in Section 2.3.3, Figures 6.1 and 6.2 plot the surface response of the attribute coefficients in relation to attribute level performance. In terms of the Kano model, attributes can take one of the following forms: (i) “Basic” attributes (basic customer expectations often taken for granted when well provided but source of major dissatisfaction when poorly provided); (ii) “Performance” attributes (satisfaction increases linearly with the attribute performance); (iii) “Excite/ Attractive” attributes (improved performance results in disproportionately high customer satisfaction); (iv) “Indifferent” attributes (respondent is neutral irrespective of the level of the service attribute), and (v) “Reverse” attribute (attributes that customers would prefer not to have). Classification of attributes into any one of the categories is done qualitatively through the completion of the Kano questionnaire. The questionnaire asks for each attribute two questions about the attribute: (i) a functional form and (ii) a dysfunctional form relating to attribute performance. For the functional form the respondent is asked to provide feedback on how they would feel if the attribute was in order and the opposite is in the dysfunctional form of the question. Based on a matrix of responses (Table 2.2) an attribute can be classified as one of the five (5) categories if the largest proportion of respondents falls within the category. The original formulation of the Kano model uses a qualitative technique to classify the attributes. In this technique, the phrases in the classification matrix (Table 2.2) “like it that way”, “must be like that”, and “can live with it that way” are considered to have varying degrees of impact on respondents’ emotions. The phrases “I like it that way” and “I dislike it that way” are deemed disproportionately further away from the phrase “I am neutral” than the phrases “It must be that way” and “I can live with it that way”.



Given that TBE users used to be non-users, it is possible that over time their preferences used to be the same as those of TBE non-users and therefore may have shifted in a manner reflected in Table 6.3. For example, attributes that used to be relatively unimportant, such as hostess service, information quality and newspapers have become relatively more important, and those that used to be valued more, such as staff respect, have become less important. This may be a reflection of the changing attribute classes, in line with the Kano model framework, resulting from experience with the service.

Unlike the conventional application of the Kano model, where individual attribute performance is plotted against customer satisfaction, the current research evaluated satisfaction as a function of a combination of attributes. The use of individual attributes is therefore not possible in the current investigation. The only individual effect of attribute performance on customer satisfaction is through the attribute level coefficients presented in Figures 6.1 and 6.2. Given that the attribute level performances are generally qualitative, the horizontal scale in both figures attempts to represent the effect of the attribute levels by linking the base performance value to 0, the next performance level to  $\pm 2$  and the third performance level to  $\pm 5$ . This spacing is for presentation purposes only and does not affect the analysis. The important values in these figures are the vertical axis values, representing attribute coefficients, especially their relative differences within and between attributes. There appears to be some reversals in the data. A reversal is defined as a coefficient value that violates an assumed monotonic relationship (essentially counterintuitive) (Hair et al., 2006). The values of the reversals are relatively small and can therefore be left unchanged (Hair et al., 2006). It appears also that these reversals appear on attributes and attribute levels that have been shown to have statistically insignificant impact on satisfaction.

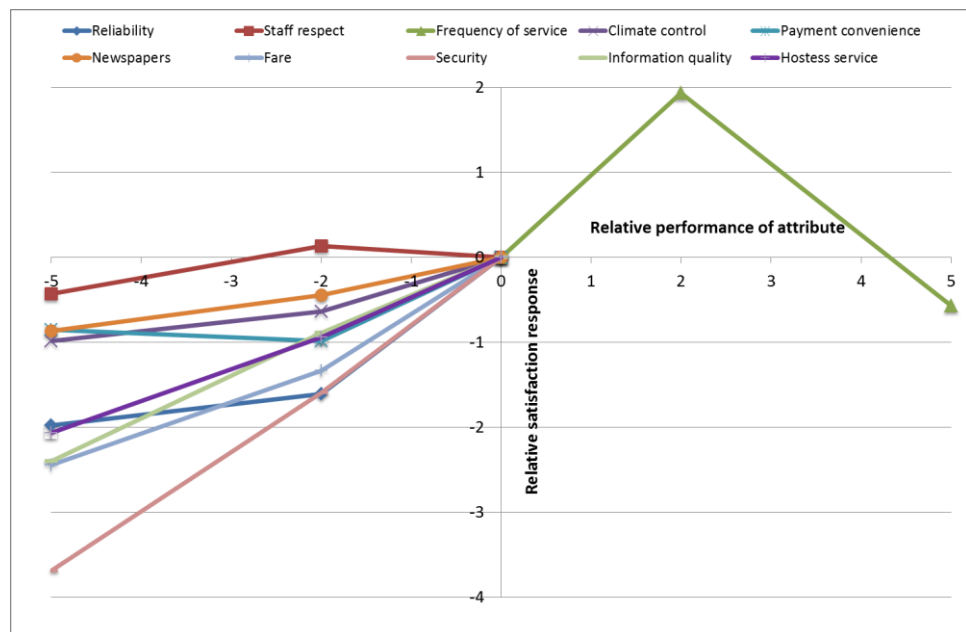
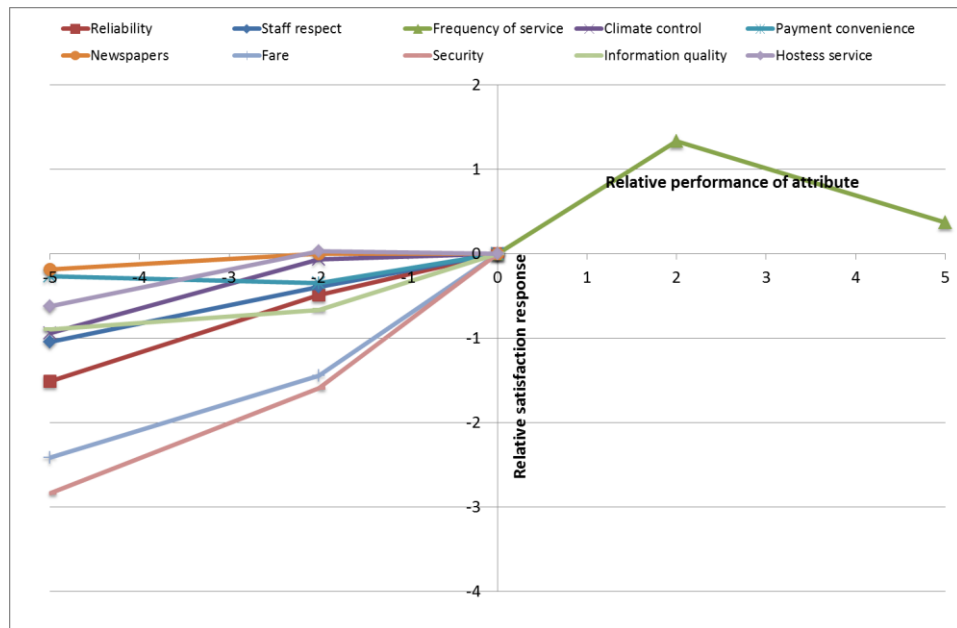


Figure 6.1: Graphical representation of user coefficient response surface



**Figure 6.2: Graphical representation of non-users coefficient response surface**

In order to classify the attributes into Kano model categories, the ratios of the differences between coefficients of attribute levels three and two as well as coefficients of attribute levels two and one were computed. These ratios are presented in Table 6.5. It was postulated that ratios with values of 1 or close to 1 represent a linear relationship and thus a performance attribute in the Kano model. Ratios above 1 represent basic attributes in the Kano model, since improvement in attribute performance has a diminishing effect on customer satisfaction. Reciprocally, ratios below 1 would represent excite attributes in the Kano model. This approach is consistent with the qualitative formulation of the Kano model. With the exception of the attribute service frequency whose levels are defined incrementally better, the negative ratio sign is indicative of a counterintuitive relationship between attribute performance and customer satisfaction and are indicative of the presence of reversals. In this case study, these reversals are present at attribute levels that have been shown to have a statistically insignificant relationship to customer satisfaction. Therefore attributes with negative ratio signs can be classified as indifferent in the Kano model.

**Table 6.5: Classification of service attributes in line with the Kano model**

Attribute	Hypothesised attribute class	User		Non-user	
		Ratio	Implied class	Non-User	Implied class
Reliability	Basic	0.23	Excite	2.06	Basic
Staff respect	Basic	-4.27	Indifferent	1.66	Basic
Frequency of service	Performance	-1.30	Basic	-0.72	Excite/Performance
Climate control	Performance	0.55	Excite	13.43	Basic
Payment convenience	Excite	-0.13	Indifferent	-0.25	Indifferent
Newspapers	Excite	0.94	Excite/Performance	2335.14	Performance
Fare	N/A	0.83	Excite/Performance	0.67	Excite/Performance
Security	Basic	1.31	Basic	0.78	Excite/Performance
Information quality	Performance	1.70	Basic	0.35	Excite
Hostess service	Excite	1.19	Basic	-25.75	Indifferent

Based on this classification system, there are some notable differences between users and non-users. For example, while climate control is an excite attribute for users, it is a basic attribute for non-users. Where there are differences between users and non-users in terms of attribute classification, the service designer may elect to treat a specific attribute in the worst case expressed by either users or non-users so that both groups will be satisfactorily accommodated. There are also notable differences between the hypothesised attribute classes in Table 5.1 and the quantified classes in Table 6.5. It can be concluded by the foregoing analysis that service attributes and their impact on customer satisfaction can only be classified, once properly measured, for the market in which they were measured. It is incumbent upon the contracting authority to understand the market being served in order to facilitate the design of service contracts that are market responsive. Failure to do so may lead to the maximisation of service gaps (promotional, understanding and procedural gaps) identified by Hill and Alexander (2006) (Section 2.3.1), resulting in a structurally misaligned service between intended customers and the service offering. Given that the classification of attributes in the Kano model is sensitive to the number of attribute levels, larger respondent samples and/or increased number of attribute levels would improve the classification accuracy.

#### 6.4 THE IMPACT OF SATISFACTION ON MODE CHOICE

Binary logit models were fitted to the relationship between the service satisfaction rating and the decision made by the users and non-users to either use TBE or use their personal cars for commuting. By way of description, a binary logit model is a probabilistic model

in which a dependent categorical variable with only two outcomes (binary variable) is regressed against a continuous or discrete variable in the generalised form:

$$P(x) = \frac{e^{(Bx+k)}}{1+e^{(Bx+k)}}$$

Where  $x$  = value of predictor variable  $x$

$B$  = coefficient

$k$  = Constant

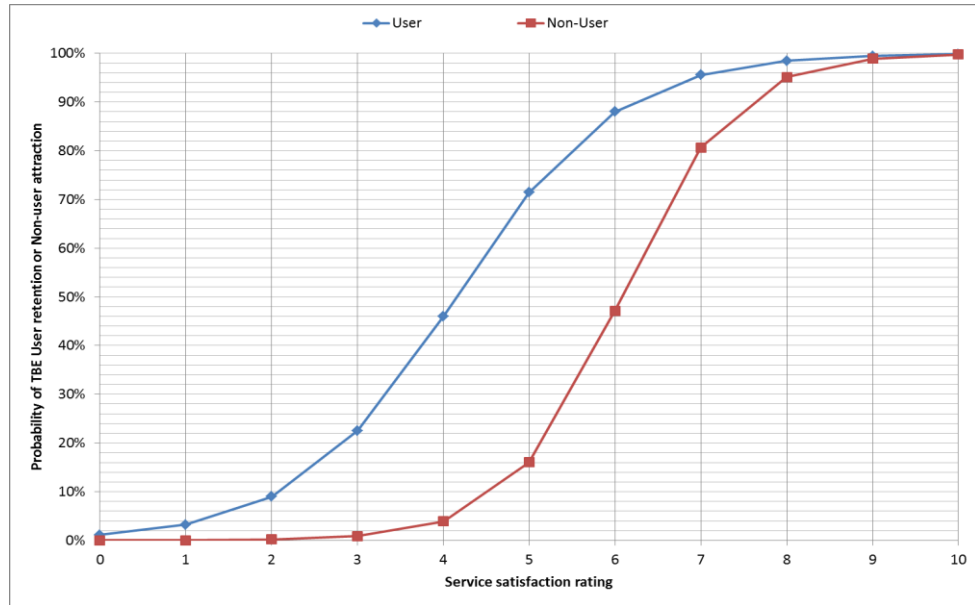
$P(x)$  = Probability of an outcome  $x$

The binary logistic model parameters for both TBE users and non-users are summarised in Table 6.6. The relationships are significantly strong with Nagelkerke  $R^2$  ranging between 0.76 and 0.84 for users and non-users respectively. Based on these model parameters, Figure 6.3 shows curves fitted to the relationship between satisfaction rating and the probability of a user being retained on TBE or a non-user being attracted to TBE.

**Table 6.6: Customer satisfaction binary logit model parameters**

Respondent category	Coefficient	Constant	Nagelkerke $R^2$
User	1.08	-4.47	0.76
Non-user	1.54	-9.37	0.84

Based on Figure 6.3 it can be concluded that satisfaction rating is a strong predictor of mode choice. Furthermore, existing users of the service are more tolerant of perceived poorer services than non-users of the service. This further implies that, for a given service, it is easier to retain existing customers than to attract new ones. For users, the difference in the probability of being retained can be as much as 5% for the same service rating, for non-users it can be as high as high as 50%. Therefore the same rating by existing customer and non-users is not likely to produce the same patronage outcomes, especially at lower satisfaction ratings.



**Figure 6.3: Probability of customer retention or non-user attraction to TBE**

## 6.5 SUMMARY

The estimation of the customer satisfaction models showed that:

- a) The significance of attribute impact on satisfaction varies with attribute level values.
- b) User satisfaction tends to be more affected by the service promotional attributes such as newspaper provision than non-user satisfaction
- c) In terms of attribute importance, safety, fare level and reliability are the most important attributes for both users and non-users. Generally, however, the responses of users and non-users tend to be different. An attempt to classify the service attributes in terms of the Kano model framework was successful, albeit with some counterintuitive results.
- d) Mode choice between public transport and private car for both users and non-users is sensitive to satisfaction. Relative to users, non-users are relatively higher satisfaction thresholds.

## **7 PRACTICAL IMPLICATIONS**

### **7.1 INTRODUCTION**

In this chapter the practical implications of the research findings on public transport contract management are analysed. The analysis covers implications on contract specifications, the actual contracting of operators, contract monitoring and contracting costs.

### **7.2 CONTRACT SPECIFICATIONS**

In this section the research findings are interpreted in terms of implications on how the contract clauses should be specified. The specifications are valid for both cases of revenue risk being with the operator or the authority. In the case of operator revenue risk, the specifications ensure that cost-cutting measures are not detrimental to service quality. In the case of authority revenue risk the specifications ensure that the operator is incentivised to perform beyond minimum service offering.

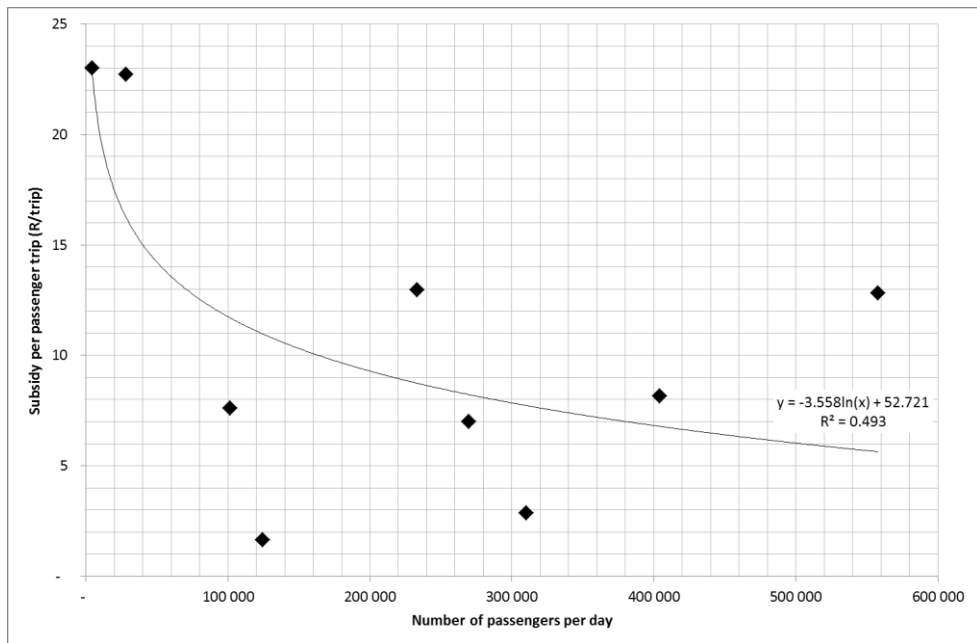
#### **7.2.1 Scope for applying research findings**

Contract conditions are generally in three forms, namely: (i) obligatory conditions from which no deviation is allowed, (ii) minimum conditions which may be exceeded, and (iii) guidance conditions which are open to any form of modification (Gonzalez-Diaz and Montoro-Sanchez, 2011). Obligatory conditions include clauses relating to standard operating procedures, which if breached, stringent action should be taken. Complying with standard operating procedure should not be incentivised. The contract design recommendations in this research would best be specified as minimum conditions in the contract, which if exceeded should receive an incentive. For example, being able to raise customer satisfaction above a set base level should attract some incentive.

#### **7.2.2 Probability of retention and attraction**

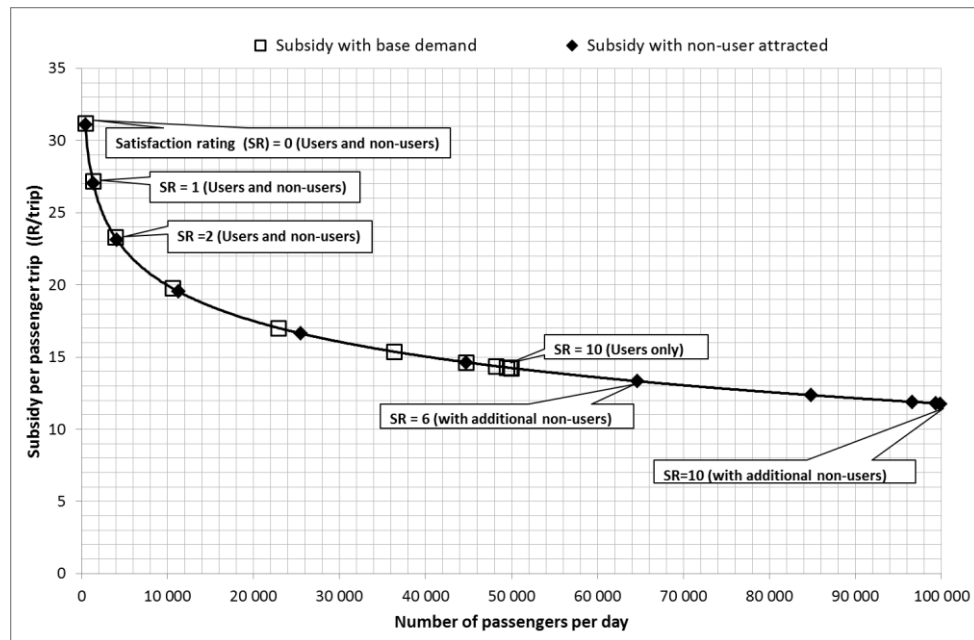
Two of the primary goals of a service are to retain existing customers on the one hand and attract new ones on the other. Based on the relationship between customer satisfaction and choice of mode, it was shown that customer retention and attraction is strongly associated with the overall level of satisfaction. It follows that contract incentives must be linked with probability of customer retention or attraction and not just satisfaction with the level of individual attribute satisfaction. In fact, being satisfied with one attribute does not guarantee satisfaction with the whole service and the likelihood of being retained or attracted as a customer. It can also be argued that customer satisfaction is a demand-oriented indicator as opposed to a supply-oriented indicator, which have generally been shown to favour the operator as opposed to the customer (Rietveld, 2005).

In order to demonstrate the practical implications of customer satisfaction on public transport retention and attraction, subsidised bus services in South Africa are used as a case study. Figure 7.1 shows, for subsidised bus services in South Africa, the relationship between passengers carried and subsidy per passenger trip, where each point represents a subsidised bus service. The relationship is approximated by a logarithmic relationship shown in Figure 7.1 with  $R^2$  of 0.5. Using this relationship, Figure 7.2 is constructed on the basis of having a synthetic population consisting of 50 000 choice users already using public transport and another 50 000 not using public transport but willing to do so if it meets their requirements. Each point in Figure 7.2 represents for each different customer satisfactions ratings, from 0 to 10, the relationship between passenger numbers and the amount of subsidy per passenger. The probable market shares are estimated on the basis of the parameters in Table 6.6.



Source: Calculated from Department of Transport (2009)

**Figure 7.1: Relationship between public transport patronage and subsidy in South Africa**



**Figure 7.2: Estimated relationship between patronage and subsidy implications**

Satisfaction level 0 is associated with high levels of subsidy because the number of users is at a minimum to cover operating costs. Notwithstanding the Mohring effect (not taken into account in this analysis), which postulates that additional public transport demand introduces increases in marginal operating costs (Gómez-Lobo, 2011), increased satisfaction results in increased patronage and reduced subsidy payments per passenger trip. For existing users, when the satisfaction levels increase the amount of subsidy per passenger also reduces to an extent that a service rated at satisfaction level 10 is equivalent to halving of subsidy per passenger, because there are more users to offset operational costs. When a greater number of non-users are attracted through improved perception of service quality, the subsidy payment per passenger at satisfaction rating of 10, for example, is equivalent to reducing subsidy per passenger by two thirds. In developing countries like South Africa such efficiency gains would be welcome. Apart from public transport efficiency gains, other benefits include potential savings from reduced household transport costs, reduced expenditure on energy imports, and emission reductions. Incentivising the operator for increased customer satisfaction above a base level should be reflective of the mitigation effect of customer satisfaction on these costs. The cost savings would be directly proportional to number of trips that would have otherwise used individualised travel (estimated from the model above) multiplied by average trip length for individualised vehicle kilometres. The values of parameters for such an incentive framework would be policy dependent.

### 7.2.3 Service marketing must form an integral part of the contract

Customers rate the service on the basis of what constitutes the service. Satisfaction is then a function of the gap between what they perceive in the service package and what



they expect. Given that customers generally have a varied perception of expectations, as found in the research, service marketing, in the form of service promotion, creates a common reference of the service definition. The research actually showed that existing TBE users only got to use the service because of some form of promotional activity.

Marketing for choice users is especially important, because they often overestimate the time, money and effort it takes to use public transport (Stradling, 2002; Dziekan, 2008; MTPWWM, 2010). It has actually been shown that it takes concerted effort such as individualised marketing and dedicated social marketing programmes to modify travel habits of potential choice users (Brog et al., 2002; Thøgersen, 2014). Therefore it is incumbent upon the contract design to make provision for service marketing that will pre-define the service for the customer, as part of the bidding process and not as an afterthought. This principle has long been established in marketing literature, where marketing (comprising the actual service/product definition, pricing strategy, promotion strategy and access planning) is seen as an integral part of the business (Hooley et al., 1990).

The current public transport contracting practices are generally not explicit on marketing strategy. Service promotion is seen as a responsibility for contracting authorities (TfL, 2008). In the case of South Africa, the model contract document limits marketing to the statement: *“The operator must contribute to and conform to the style guide provided by the contracting authority, which will define the use of graphics, information signage, timetables, advertising material and vehicle livery”* (Department of Transport, 2013), and no resource provision is made for marketing. In contrast, retail franchising tends to be explicit on the role of the contractor and the operator. For example, where marketing responsibility is placed on franchisors (contractors), the franchiser (contracting authority) either puts resources on the initial training of the franchisor on service quality and/or the franchiser takes the overall responsibility for marketing and the franchisor pays for the marketing service (Baron and Schmidt, 1991). Either way, marketing is properly budgeted for.

Public transport contracts must therefore be explicit on the allocation of responsibilities and resources for service marketing.

#### **7.2.4 Distinguish between relative importance of attributes and attribute levels**

The relative importance of attributes and attribute levels that make up the service package must be calibrated for the areas in which the service is provided. This is because respondents are likely to have different attitudes depending on their socio-economic background. When contractual penalties are imposed, this must be commensurate with the impact of the contravention. A calibrated customer satisfaction model can be used to

estimate the impact of performance on satisfaction, and in turn estimate implications in terms of ability to retain existing customers and attract new customers.

The current contracting practice puts more emphasis on the operator behaviour, in the form of standard operating procedures, much more than it considers customer experience. Standard operating procedures are mainly intended to produce predictable industry outcomes (Hill, 2012), irrespective of customers being served. In contrast, a customer-oriented service would ensure that in addition to having standard operating procedures, the service needs to be customer responsive. Incorporation of the relative importance of both the attributes and the attribute levels provides an opportunity to design more customer responsive service.

#### **7.2.5 Attribute importance is a variable**

The differences in attribute and attribute level weights between users and non-users may be an indication that that attribute importance changes relative to the intensity of competing services. Therefore the importance of attribute may not be constant throughout the contract duration.

In response, the contract needs to make allowance for the recalibration of the service definition. This requirement may have implications on the contract unit costs during the life of a contract, in that relatively more resources may be required in order to implement more customer-responsive services. Allowance for this aspect needs to be made in the bidding process and, within the context of travel demand management, be weighed against the generalised costs of doing nothing.

#### **7.2.6 The existing customers and potential customers must be part of contract design**

Leaving the service design to the authority and the operator, as is currently the case, can result in specifications that fall short of addressing customer concerns. It has been shown empirically that even operators and drivers have incorrect perceptions of what is considered important by customers. It has also been shown that customer satisfaction responses are not always obvious. Therefore, contract design must make provision for the inclusion of the voice of the customer or potential customer. The service design resulting from such a contract has better chances of retaining existing customers and attracting new ones.

### **7.3 CONTRACT MONITORING**

Once a contract is instituted, it is necessary to place measures in place to ensure that the service delivered is in line with contract specification. The following subsections identify suitable specifications for this aspect of contract management.

### **7.3.1 Segmentation of customers and potential customers**

Current contracting monitoring arrangements make provision for measuring the satisfaction of existing customers. This approach has as a primary limitation that it is reactive as opposed to being proactive. It is likely this measurement will be limited to more service-captive customers. A more comprehensive technique should, in addition to existing users, monitor the perceptions of non-users. Within the context of travel demand management, the measuring of non-user perceptions provides an indication of the extent to which the service is attractive to them, and allows for the placing of measures to increase the likelihood of them switching to the service. Also, within the user group, the length of service use has an influence on sensitivity to service quality, where newer users tend to be more sensitive. Therefore service monitoring measurements must also segment users in terms of the length of service use. Furthermore, the measurement of contractor performance and associated remedial measures must take place from the very beginning of the service, because initial perceptions, especially by new users, may be irreversible.

### **7.3.2 Measuring customer satisfaction**

Continuous measurement of customer satisfaction with the service is a requirement. However, customers must be reminded what constitutes a service prior to rating the service. Reminding customer of what constitutes a service serves to create a common reference point for the evaluation. In the absence of this reference, the ratings may not be referring to the same thing, as it has been shown that customers have diverse needs and are highly opinionated on what should constitute an acceptable service. The outcomes of the surveys must also be communicated to customers. This will ensure that the customers are continuously aware of what constitutes the service.

## **7.4 COST IMPLICATIONS**

Specifying customer satisfaction in contracts has both increased cost and increased revenue implications for service delivery. From a business perspective, it makes sense to incorporate customer satisfaction in contracts to the extent that its marginal benefits exceed the marginal costs of implementation. On its own, the specification of customer satisfaction in public transport contracts will increase the operational costs as a result of cost components such as marketing and monitoring costs. However, it has been shown elsewhere, for example in the case of Germany, that significantly improved service together with efficiency improvements and revenue enhancement strategies can increase fare revenue in excess of the cost of implementing the service quality enhancement systems (Buehler and Pucher, 2011). This has been achievable from increasing patronage through delivering a service that is attractive to both traditional users and non-users, in agreement with the current research finding that everyone is a potential public transport

user. The cost of quality must be explicitly incorporated in the initial contract and not be an afterthought. The quality is measured relative to what is promised in the first place and not some non-referenced goal.

## 7.5 SUMMARY

This chapter identified the practicalities associated with the specification of customer satisfaction in public transport contracts. It was concluded that:

- a) Incentives must be specified in a manner that is linked with the probability of customer retention and attraction and not just customer satisfaction ratings.
- b) Marketing, through which the service is unequivocally defined, must be an integral part of the contract. The contract costing must make provision for marketing. When customers are asked to evaluate service performance, it must be in reference to what was promised as a service package.
- c) Service design must be carried out together with the involvement of existing and potential customers. The contract must also make allowance for the recalibration of the service design during the contract period.
- d) The contract must make allowance for both existing and prospective customers to rate the service performance.
- e) The rating of the service must be an on-going process, without allowance for contract monitoring window periods.
- f) The cost of incorporating customer satisfaction in contracts must be fully incorporated in contracts. However, this must be done in conjunction with measures aimed at improving the overall service efficiency and productivity.

## 8 CONCLUSIONS

Improved public transport service is one of the proven and effective travel demand management measures. Implementing improved public transport services requires that a service design be translated into a service offering acceptable to customers. Public transport contracts are increasingly being used for this purpose. However, contracts in their current form tend to focus exclusively on the relationship between the contracted operators and the contracting authorities with little or inadequately considered requirements of the customers. This has the effect of reducing public transport's role in supporting sustainable development goals in that increased travel takes place through natural resource intensive individualised transport modes. In South Africa, the geographical context of this research, public transport contracts are only recently emerging as public transport management tools, requiring significant empirical research support.

The primary goal of services, including public transport, is to satisfy customers. Customer dissatisfaction in particular may lead to switching of services or be manifested in many other forms that are detrimental to the business such as negative word of mouth, sabotage, or legal actions, particularly for captive customers. Despite the importance of customer satisfaction in services, it remains under-researched. In fact the research on public transport customer satisfaction and service quality only gained momentum from 1998.

It is nonetheless understood that customer satisfaction has an asymmetrical non-linear relationship with service attributes. Measurements of customer satisfaction have relied mainly on ordinal scales, sometimes confounded with emotions in order to calibrate the intervals between the ordinal scale units.

There are no agreements on what constitutes public transport service quality. However, it appears research is in agreement that service quality is best defined as context specific. It is based on this assumption that the current research sought to explore what constitutes service quality in a niche market comprising urban commuters who have access to a car but choose or are willing to use public transport. Experiments comprising both qualitative and quantitative research approaches were carried out in order to profile the unique features of this market segment's behaviour in respect of customer satisfaction. Furthermore, models were estimated to calibrate the relationship between customer satisfaction and service quality for this market segment. It was found that:

- a) Customers evaluate services as complete packages and not as individual attributes. However, there are attributes such as personal security that, when poorly delivered, can cause travel mode shift.

- b) Customers have diverse and often incoherent perception of what constitutes service quality. Defining the service jointly with the customers helps to create a service quality reference framework that can be reliably used for service performance evaluation by the customers.
- c) Every person is a potential public transport user. Therefore, the service also needs to be designed in a manner that is compatible with the travel requirements of the potential users. It should nonetheless be noted that potential customers are not necessarily willing to change their lifestyles significantly in order to align them with public transport service designs.
- d) Non-users of the service have particularly higher satisfaction thresholds than current users. Furthermore, users in this market segment who have only recently started to use public transport also have higher satisfaction thresholds than users who have been using the service for a prolonged period.

Specifying customer satisfaction in public transport contracts will require that service marketing be an integral part of the contracts, and that service design be carried out jointly with potential customers. The actual monitoring of contracts needs to be inclusive of both users and non-users of the service in line with public transport goals of service the community as a whole.

There is scope for using contract design as an integral part of travel demand management as long as the contract design process makes a concerted effort to understand the behaviour of the market being served. The Kano model provides a methodologically appealing framework to use for systematically understanding the impact of service attributes on customer satisfaction. Where there are differences between users and non-users in terms of attribute classification, the service designer may elect to treat a specific attribute in the worst case expressed by either users or non-users so that both groups will be satisfactorily accommodated, especially for marketing purposes.

Given that the classification of attributes in the Kano model is sensitive to the number of attribute levels, larger respondent samples and/or increased number of attribute levels would improve the classification accuracy. In practice, the relative importance of an attribute needs to provide more weight for resource prioritisation followed by the Kano attribute classes. The method presented in this research for relating customer satisfaction and service quality also makes it possible to estimate the resources required to fulfil contracts requirements where patronage increase is specified as one of the performance metrics.

## 9 RECOMMENDATIONS

The recommendations emanating from the research are grouped into two categories, comprising contract specifications and further research:

- a) **Contract specification:** In an environment where public transport competes with private transport, it is important to constantly improve public transport services in order to retain existing customers and attract new ones. If this is indeed a planning goal, it is recommended that more customer-centric performance contract designs be adopted. To achieve this it is recommended that contracts designs be carried out through a tripartite relationship that involves prospective operators, contracting authorities and potential customers. Once the service design is agreed to, it is recommended that it be used as a basis for measurement of service performance. The monitoring instruments, as illustrated in the current research, must be reflective of the needs of existing and prospective public transport customers. Incentives to operators must be reflective of the mitigating effect of customer satisfaction on generalised societal costs resulting from individualised motorised travel.
- b) **Further research:** The current study focuses on a specific market segment. It is recommended that further research into improved understanding of customer satisfaction be carried out in other market segments. Such research should include improved understanding of the behaviours of these markets in a developing country context. It is also recommended that further research be carried out to design appropriate contract incentives and disincentives linked to the behavioural responses of contracted operators and customers. In this respect, further studies should also include direct inputs from the operators. Depending on the design of the contract and its monitoring programme the total contract monitoring costs could be significantly high and in turn become detrimental to the customers. Application of information and communication technology – also referred to as Intelligent Transport Systems in the transport context – to improve the collection of customer satisfaction related data and the overall service performance also requires further investigation.

## 10 REFERENCES

- Alonso-Rasgado, M.T., Thompson, G. and Dannemark, O.J. 2004. *State of the art in service design and modelling*. University of Manchester and Volvo Aero Corporation. VIVACE Public document, Report No. D2.1.4\_1.
- Anderson, E.W., Fornell, C. and Lehman, D.R. 1994. "Customer satisfaction, market share and profitability: findings from Sweden." *Journal of Marketing*, Vol. 58, pp. 53–66.
- Artis, A.B. 2004. *A taxonomy of customer dissatisfaction-related coping tactics based on dissatisfaction-related goals*. Unpublished PhD Thesis, University of Tennessee, Knoxville.
- Baron, S. and Schmidt, R.A. 1991. "Operational aspects of retail franchises." *International Journal of Retail & Distribution Management*. Vol. 19, Iss. 2, pp. 13–19.
- Bazeley, P. 2013. *Qualitative data analysis: Practical strategies*. Sage publications Ltd, London.
- Beirao, G. and Cabral, J.A.S. 2007. "Understanding attitudes towards public transport and private car: a qualitative study." *Transport policy*, Vol. 14, pp. 478–489.
- Beradovic, M., Hulten, Y. and Pettersson, T. 2006. *Customer loyalty and satisfaction: A study of Swedbank's small corporate clients in Gothenburg*. Jonkoping International Business School, Sweden.
- Blanchard, B.S. Fabrycky, W.J. 1981. *Systems engineering and analysis*. 3<sup>rd</sup> edition. Prentice Hall Inc., New Jersey.
- Borinoco, J.S. 1998. "An investigation into the cost and benefits of reliability of services." *Omega International Journal of Management Science*, Vol. 26, No. 1, pp. 99–114.
- Bradley, M. and Daly, A. 1994. "Use of the logit scaling approach to test for rank-order and fatigue effects in stated preference data." *Transportation*, Vol. 21, Iss. 2, pp. 167–184.
- Brandt, R.D. 1988. "How service marketers can identify value-enhancing service elements." *The Journal of Services Marketing*, Vol. 2, No. 3, pp. 35–41.
- Brog, W., Erl, E. and Mense, N. 2002. *Individualised marketing: Changing travel behaviour for a better environment*. Paper presented at the OECD Workshop: Environmental Sustainable Transport, Berlin.



Buehler, R. and Pucher, J. 2011. "Making public transport financially sustainable." *Transport Policy*, Vol. 18, pp. 126–138.

Camén, C. 2011. *Using contracts to manage services: A study of contracts in public transport*. PhD Dissertation: Faculty of Economic Sciences, Communication and IT Business Administration, Karlstad University, Sweden.

Centre for Quality of Management Journal (CQMJ). 1993. *A special issue on Kano's methods for defining customer defined quality*, edited by David Walden, Vol. 2, No. 4.

Chen, L. 2012. *A novel approach to regression analysis for the classification of quality attributes in the Kano model: An empirical test in the food and beverage industry*. *Omega*, 40, pp. 651–659.

Christie, R.H. 1996. *The law of contract in South Africa*. Third edition. Butterworths Publishers, Cape Town,

Clifton, K.J and Handy, S.L. 2001. *Qualitative methods in travel behaviour*. Paper presented at the International Conference on Transport Survey Quality and Innovation, South Africa.

Cook, L.S., Bowen, D.E., Chase, R.B., Dasu, S., Stewart, D.M. and Tansik, D.A. 2002. "Human issues in service design." *Journal of operations management*. Volume 20, pp. 159–174.

Cooper, A.R., Cooper, M.B. and Duhan, D.F. 1989. *Measurement instrument development using two competing concepts of customer satisfaction*. CD/D&CB, Vol. 2, pp. 28–35.

Costello, M. and Teeling, S. 2003. To franchise or not to franchise – is it even a question? *Student Economic Review*. Vol. 17, pp. 199–212.

Council for Science and Industrial Research. 1999. *Stated preference in the Daveyton-Dunswart corridor*, Technical report TR-99/061, Pretoria.

Cronin, J.J and Taylor, S.A. 1992. "Measuring service quality: A reexamination and extension." *Journal of Marketing*, Vol. 56, pp. 55–68.

Danaher, P.J. 1997. "Using conjoint analysis to determine the relative importance of service attributes measured in customer satisfaction surveys." *Journal of retailing*, Vol. 73(2), pp. 235–260.

Dean, A.M. and Kiu, C. 2002. "Performance monitoring and quality outcomes in contracted services." *International Journal of Quality and Reliability Management*, Vol. 19, No. 4, pp. 396–413.

Del Mistro, R. and Arentze, T. 2002. “Applicability of stated preference for mode choice studies among less literate commuters.” *Journal of the South African Institution of Civil Engineering*, Vol. 44. No. 4, pp. 16–24.

Department of Transport. 1996. *White Paper on national transport policy*, South Africa.

Department of Transport. 1998. *Moving South Africa: A transport strategy for 2020*. Report and strategy recommendations, South Africa.

Department of Transport 2006. “Model tender and contract documents for public transport services.” *Government Gazette*, Notice 1058 of 206, Pretoria, South Africa.

Department of Transport. 2009. *Bus subsidy budget shortfall 2008/2009*. Presentation to the transport portfolio committee. Cape Town, South Africa.

Department of Transport 2013. “Model tender and contract documents for public transport services.” *Government Gazette*, Notice 568 of 2013, Pretoria, South Africa.

Domberger, S. and Rimmer, S. 1994. “Competitive tendering and contracting in the public sector: a survey.” *International Journal of the Economics of Business*, Vol. 1, No. 3, pp 439–453.

DPME (Department of Performance Monitoring and Evaluation). 2012. *Development indicators*. Pretoria, South Africa.

Dziekani, K. 2008. “What people know about their public transport options? Investigating the memory representations of public transport through telephone interviews in a residential area of Stockholm, Sweden” *Transportation*, Vol. 35, 519–538.

Eboli, L. and Mazzulla, G. 2009. “A new customer satisfaction index for evaluating transit service quality.” *Journal of public transportation*, Vol. 12, No. 3, pp. 21–37

Eboli, L. and Mazzulla, G. 2011. “A methodology for evaluating transit service quality based on subjective and objective measures from passenger’s point of view.” *Transport Policy*, Vol. 18, 172–181.

Eriksson, L., Friman, M. and Gärling, T. 2008. “Stated reasons for reducing work-commute by car.” *Transportation Research Part F*, vol. 11, pp. 427–433.

Ferguson, E. 2000. *Travel demand management and public policy*. Ashgate Publishing Ltd, England.

Edvardson, B. 1998. “Causes of customer dissatisfaction – studies of public transport by the critical-incident method.” *Managing Service Quality*, Vol. 8, No. 3, pp. 189-197.

Francois, P. and MacLachlan, D. 1999. *Bridging designs for conjoint analysis: The issue of attribute importance*. Research Report 9935. Departement Toegepaste Economische Wetenschappen, Katholieke Universiteit Leuven

Friman, M., Edvardsson, B. and Gärling, T. 2001. "Frequency of negative incidents and satisfaction with public transport services I." *Journal of retailing and consumer services*. Vol. 8, pp. 95–104.

Friman, M. and Gärling, T. 2001. "Frequency of negative incidents and satisfaction with public transport services II." *Journal of retailing and consumer services*. Vol. 8, pp. 105–114

Friman, M. 2004b. "Implementing quality improvements in contracts." *Journal of public transportation*, Vol. 7, No. 4, pp. 49–65.

Gakenheimer, R. 1999. "Urban mobility in the developing world." *Transportation Research Part A*, 33: pp. 671–689.

Gärling, T., Eek, D., Loukopoulos, P., Fujji, S., Johansson-Stenman, O., Kitamura, R., Pendyala, R. and Vilhelmson, B. 2002. "A conceptual analysis of the impact of travel demand management on private car use." *Transport Policy*, Vol. 9, pp. 59–70.

Gatta, V. and Marcucci, E. 2007. "Quality and public transport service contracts." *European Transport*. No. 36, pp. 92–106.

Gilbert, G.R. 2006. "A cross-industry comparison of customer satisfaction." *Journal of service marketing*, Vol. 20, No. 5, pp. 298–309.

Goldstein, S.M., Johnston, R., Duffy, J. and Rao, J. 2002. "The service concept: the missing link in service design research?" *Journal of operations management*, Vol. 20, pp. 121–134.

Gómez-Lobo, A. 2011. *Monopoly, subsidies and the Mohring effect: A synthesis and an extension*. Department of Economics, University of Chile, Chile

Gómez-Lobo, A. and Briones, J. 2014. "Incentives in bus concession contracts: A review of several experiences in Latin America." *Transport Reviews*, Vol. 34, No. 2, pp. 246–265.

Gonzalez-Diaz, M. and Montoro-Sanchez, A. 2011. "Some lessons from incentive theory: Promoting quality in public transport." *Transport Policy*, Vol. 18, pp. 299–306.

Gordon, C., Mulley, C., Stevens, N. and Daniels, R. 2013. "Public private contracting and incentives for public transport: Can anything be learned from the Sydney metro experience" *Transport policy*, Vol. 27, PP. 73–84.

Grigoroudis, E. and Siskos, Y. 2010. *Customer Satisfaction Evaluation*, International Series in Operations Research & Management Science 139, DOI 10.1007/978-1-4419-1640-2\_1, Springer Science & Business Media, LLC, London.

Grosvenor, T. 2000. *Qualitative research in the transport sector*. Resource paper for the Workshop on Qualitative/Quantitative Methods, proceedings of an International Conference on Transport Survey Quality and Innovation, Grainau, Germany.

Guiver, J.W. 2007. "Modal talk: Discourse analysis of how people talk about bus and car travel." *Transportation Research Part A*, Vol. 41, pp. 233–248.

Gustafsson, A., Herrmann, A. and Huber, F. 2007. *Conjoint measurement: Method and applications*, 4<sup>th</sup> edition, Springer, Berlin.

Gwilliam, K. 2005. *Bus franchising in developing countries: Some recent World Bank experience*. Institute of Transport Studies, University of Leeds.

Gwilliam, K. 2008. "A review of issues in transit economics." *Research in Transport Economics*, Vol. 23, pp. 2–22.

Hair, J.F., Black, W.C., Babin, B.J., Angerson, R.E. and Tathan, R.L. 2006. *Multivariate data analysis*, 6<sup>th</sup> edition, Prentice Hall, New Jersey.

Hensher, D.A. 1994. "State preference analysis of travel choices: The state of the practice." *Transportation*, Vol. 21, pp. 107-133.

Hensher, D.A. and Prioni, P. 2002. "A service quality index for area-wide contract performance assessment." *Journal of Transport Economics and Policy*, Vol. 36, Part 1, pp. 93–113.

Hensher, D. A. and Stanley, J. 2003. "Performance-based quality contracts in bus service provision." *Transportation Research Part A*, Vol. 37, pp. 519–538.

Hensher, D.A. Stopher, P. and Bullock, P. 2003. "Service quality – developing a service quality index in the provision of commercial bus contracts." *Transportation research, Part A*, Issue 37, pp. 499–517.

Hensher, D.A., Rose, J.M., and Greene, W.H. 2005. *Applied choice analysis – A primer*. Cambridge University Press, UK.

Hensher, D.A. and Stanley, J. 2010. "Contracting regimes for bus services: What have we learnt after 20 years?" *Research in Transportation Economics*, Vol. 29, pp. 140–144.

Hensher, D.A., Mulley, C. and Smith, N. 2013. "Towards a simplified performance-linked value for money model as a reference point for bus contract payments." *Research in Transport Economics*, Vol. 39, pp. 232–238.

Hess, S., Hensher, D. and Daly, A.J. 2012. "Not bored yet – revisiting respondent fatigue in stated choice experiments." *Transportation Research Part A: Policy and Practice*, 46 (3).

Hill, N. and Alexander, J., 2006. *The handbook of customer satisfaction and loyalty measurement*, 3<sup>rd</sup> Edition, Gower Publishing.

Hill, A.V., Collier, D.A., Froehle, C.M., Goodale, J.C., Metters, R.D. and Verma, R. 2002. "Research opportunities in service process design." *Journal of Operations Management*, Vol. 286, pp. 1–14.

Hill, A.V. 2012. *The encyclopaedia of operations management: A field manual and glossary of operations management terms and concepts*. Pearson Education Inc. New Jersey.

Hooley, G.J., Lynch, J.E. and Shepherd, J. 1990. "The marketing concept: Putting the theory into practice." *European Journal of Marketing*. Vol. 29, Iss. 9, pp. 7–24.

Hooper, L. 2008. "Paying for performance: Uncertainty, asymmetric information and the payment model." *Research in Transportation Economics*, Vol. 22, pp. 157–163.

Kain, P. 2006. *The pitfalls in competitive tendering: addressing the risks revealed by experience in Australia and Britain*. European Conference of Ministers of Transport, Paris.

Kitamura, R., Nakayama, S. and Yamamoto, T. 1999. "Self-reinforcing motorization. Can travel demand management take us out of the social trap?" *Transport Policy*, Vol. 6, pp. 135–145.

Kitzinger, J. 1995. "Introducing focus groups." *British Medical Journal*, 311: 299.

Koppelman, F.S. 1981. "Non-linear utility functions in models of travel choice behaviour." *Transportation*, Vol. 10. pp. 127–146.

Koushki, P.A., Al-Saleh, O.I. and Al-Lumaia, M. 2003. "On management's awareness of transit passenger needs." *Transport Policy*, Issue 10, pp. 17–26.

Kwak, Y.H. and Anbari, F.T. 2004. "Benefits, obstacles and future of six sigma approach." *Technovation* xx, pp. 1–8.

Lin, S., Yang, C., Chan, Y. and Sheu, C. 2010. "Refining Kano's quality attributes-satisfaction model: A moderated regression approach." *International Journal of Production Economics*, Vol. 126, pp. 255–263.

Lofgren, M. 2006. *The leader of the pack: A service perspective on packaging and customer satisfaction*. Dissertation, Faculty of Economic Sciences, Communication and IT, Karlstad University, Sweden.

Lombard, M., Cameron, B., Mokonyama, M. and Shaw, A. 2007. *Report on trends in passenger transport in South Africa*. Development Bank of Southern Africa, South Africa.

McLafferty, I. 2004. "Focus group interviews as a data collection strategy." *Journal of advanced nursing*, Vol. 42 (2), 187–194.

Maffei, S., Mager, B. and Sangiorgi, D. 2005. *Innovation through service design: From research and theory to a network of practice – A users' driven perspective*. University of Art and Design Helsinki, Italy.

Martinez-Lorente, A.R., Dewhurst, F. and Dale, B.G. 1998. "Total quality management: origins and evolution of the term." *The TQM Magazine*, Vol. 10, Iss. 5.

Matzler, K. and Hinterhuber H.H. 1998. "How to make product development projects more successful by integrating Kano's model of customer satisfaction into quality function deployment." *Technovation*, Vol 18, No. 1, pp. 25–38.

May, A.D. 2004. "Singapore: The development of a world class transport system." *Transport reviews*, Vol. 24, No. 1, pp. 79–101.

Mehndiratta, S.R. Picado, R. and Venter, C. 2001. *A qualitative survey technique to explore decision making behaviour in new context*. Paper presented at the International Conference on Transport Survey Quality and Innovation, South Africa.

Millard-Ball, A. and Schipper, L. 2011. "Are we reaching peak travel? Trends in passenger transport in eight industrialized countries." *Transport Reviews: A transnational transdisciplinary journal*, 31:3, 357–378.

Mokonyama, M. and Venter C. 2007. "Forecasting household car ownership in South Africa: Alternative models and future trends." *Journal of the South African Institution of Civil Engineering*, Vol. 49, No. 3, pp. 2–10.

Mont, O. and Plepys, A. 2003. *Customer satisfaction: review of literature and application to the product-service systems*. Final Report to the Society for Non-Traditional Technology. The International Institute for Industrial Environmental Economics, Lund University, Sweden.

Mouwen, A. and Rietveld, P. 2013. "Does competitive tendering improve customer satisfaction with public transport? A case study for the Netherlands." *Transportation Research Part A*, Vol. 51, pp. 29–45.

MTPWWM (Ministry of Transport, Public Works and Water Management). 2010. *Public transport in the Netherlands*. The Hague, Netherlands.

Nilsson-Wittel, L and Fundin, A. 2005. "Dynamics of service attributes: A test of Kano's theory of attractive quality." *International journal of service industry management*, Vol. 16, No. 2, pp. 152–168.

Oliver, R.L. 1980. "A cognitive model of the antecedents and consequences of satisfaction decisions." *Journal of Marketing Research*, Vol. XVII, pp. 460–469.

Ortuzar, J. and Willumsen, L.G. 2001. *Modelling transport*. 3rd edition. John Wiley & sons Ltd, England.

Parasuran, A. Zeithaml, V.A. and Berry, L.L. 1985. A conceptual model of service quality and its implications for future research. *The Journal of Marketing*, Vol. 49, No. 4, pp. 41–50.

Puchta, C. and Potter, J. 2004. *Focus group practice*. Sage Publications Ltd, London.

Ramaswamy, R. 1996. *Design and management of service processes: keeping customers for life*. Engineering process improvement series, Addison-Wesley Publishing Company, Inc. Massachusetts.

Redman, L., Friman, M., Gärling, T. and Hartig, T. 2013. "Quality attributes of public transport that attract car users." *Transport Policy*, Vol. 25, pp. 119–127.

Rietveld, P. 2005. "Six reasons why supply-oriented indicators systematically overestimate service quality in public transport." *Transport reviews*, Vol. 25, No. 3, pp. 319–328.

RSA (Republic of South Africa), 2009. National Land Transport Act: Act 5 of 2009. *Government Gazette*, Vol. 526, No. 32110, Cape Town.

SAARF (South African Audience Research Foundation), 2013. *SAARF Segmentation tools*. Accessed 14 December 2013, <http://www.saarf.co.za/lsm-presentations/>.

Sammer, G. "Identifying and reconciling the data needs of public transit planning, marketing and performance measurement." *Transport survey methods: Keeping up with a changing world*. Eds. P. Bonnel, M Lee-Gosselin, J. Zmud, and J. Madre. Emerald Group Publishing Limited, UK, pp. 321–348.

Sarantakos, S. 2005. *Social research*. 3<sup>rd</sup> edition, Palgrave, Macmillan, New York.

Schafer, A. 1998. "The global demand for motorized mobility." *Transportation Research Part A*, Vol. 32, No. 6, pp. 455–477.

Seth, N., Deshmukh, S.G. and Vrat, P. 2005. "Service quality models: a review. International" *Journal of quality and reliability management*, Vol. 22, No. 9, pp. 913–949.

Stanley, J. and Van De Velde, D. 2008. "Risk and reward in public transport contracting." *Research in Transportation Economics*, Vol. 22, pp. 20–25.

Stradling, S.G. 2002. *Transport user needs and marketing public transport*. Proceedings of the ICE-Municipal engineer, Vol. 151, Iss. 1, pp. 23–28.

StatsSA (Statistics South Africa). 2012. *General household survey 2011*. Statistical release PO0318, Pretoria, South Africa.

Tan, K.C. and Shen, X.X. 2000. "Integrating Kano's model in the planning matrix of a quality function deployment." *Total Quality Management*, Vol. 11, No. 8, pp. 1141–1151.

Tatikonda, M.V. and Zeithaml, V.A. 2002. "Managing the new service development process: multi-disciplinary literature synthesis and directions for future research." *New directions in supply-chain management: Technology, strategy and implementation*. Ed. T. Boone and R. Ganeshan. American Management Association, New York, pp. 153–170.

TfL (Transport for London). 2008. *London's bus contracting and tendering process*. Transport for London publication, London, UK.

Tien, J.M. and Berg, D. 2003. A case for service systems engineering. *Journal of systems science and systems engineering*. Vol. 12, No. 1, pp. 13–38.

TCRP (Transit Cooperative Research Programme), 2003. *Transit capacity and quality of service manual*. TCRP Report 100, Transportation Research Board, Washington.

Thøgersen, J. 2014. "Social marketing in travel demand management." *Handbook of sustainable travel*. Ed. T. Gärling, D. Ettema and M. Friman. Springer Netherlands. pp.113–130.

TRB (Transportation Research Board). 1999. *A handbook for measuring customer satisfaction and service quality*. Transit Cooperative Research Program Report 47, National Academy Press, Washington D.C.

Treitel, G.H. 1989. *An outline of the law of contract*. 4<sup>th</sup> edition. Butterworth, London.

Tutz, G. 2012. *Regression for categorical data*. Cambridge series in statistical and probabilistic mathematics, Cambridge University Press, New York.



United Nations. 2012. *Shanghai Manual: A guide for sustainable urban development in the 21<sup>st</sup> century*. United Nations Department of Economic and Social Affairs, Shanghai, China.

Van de Velde, D., Veeneman, W. and Schipholt, L.L. 2008. "Competitive tendering in the Netherland: Central planning vs. functional specifications." *Transportation Research Part A: Policy and Practice*, Vol. 42, Iss. 9, pp. 1152–1162.

Vermeulen, I.E. and Seegers, D. 2009. "Tried and tested: The impact of online hotel reviews on consumer consideration." *Tourism management*, Vol. 30, Iss. 1, pp. 123–127.

Vuchic, V. R. 2005. *Urban transit operations, planning and economics*. John Wiley & Sons, Inc. New Jersey.

Walters, J. and Cloete, D. 2008. "The South African experience with negotiated versus competitively tendered bus contracts." *Transportation Research Part A*, Vol. 42, pp. 1163–1175.

Westbrook, R.A. 1980. "A rating scale for measuring product/service satisfaction." *Journal of Marketing*, Vol. 44, Fall, pp. 68–72.

Wittink, D.R., Huber, J., Zandan, P. and Johnson, R.M. 1992. *The number of levels effect in conjoint analysis: Where does it come from, and can it be eliminated*. Sawtooth Software Conference Proceedings, Sequim, Washington.

Wirtz, J. and Bateson, J.E.G. 1995. "An experimental investigation of halo effects in satisfaction measures of service attributes." *International journal of service industry management*, Vol. 6, No.3, pp. 84–102.

Wong, L. 2003. *Contractual relationships between authorities and operators: Hong Kong experience*. Proceedings of the International Association of Public Transport Conference, Vienna, Austria.

Yahya, N. Nelson, J.D. and Mulley, C. 2007. *Evaluating the effect of quality of bus users' satisfaction*. Proceedings of the 87<sup>th</sup> Transport Research Board Annual Meeting, Washington D.C.

Ye, Q., Law, R. and Gu, B. 2009. "The impact of online user reviews on hotel room sales." *International Journal of Hospitality Management*, Vol. 28, pp 180–182.

Yeung, M.C.H. Ramasany, B. Chen, J. and Paliwoda, S. 2013. "Customer satisfaction and consumer expenditure in selected European countries." *International Journal of Research in Marketing*, Vol. 30, pp. 406–416.

Zultner, R.E. and Mazur, G.H. 2006. *The Kano model: recent developments*. The eighteenth symposium on quality function deployment. Quality Function Deployment Institute, Austin, Texas.

## 11 APPENDIX A: QUALITATIVE SURVEY QUESTIONNAIRE

### 11.1 INTRODUCTION

Appendix A consists of discussion guides used in the focus groups. Section 11.2 is the discussion guide used for TBE users and Section 11.3 contains the discussion guide used for TBE non-users.

### 11.2 QUALITATIVE QUESTIONNAIRE FOR CURRENT USERS OF TSHWANE BUSINESS EXPRESS

**The moderator is made aware of the following points:**

- This questionnaire is prepared for the users of the Tshwane Business Express. The target market is typically people in LSM 7 and above.
- Questions probe as much as possible the relationship between service and customer satisfaction. The aim is to understand what these concepts mean to the Tshwane Business Express passengers in their own terms. Also, it is important to know what scales of measure, if any, the passengers use to gauge service quality.
- Please reassure the respondents that every answer counts and that they should not hold back any response.
- It is also important to understand what personal circumstances (or changes in personal circumstances) might have contributed to certain responses. In a group environment this aspect may be difficult to probe due to sensitivity about personal issues. Nonetheless, it needs to be probed.
- The questions have been colour-coded.
- All questions not coloured need to be asked.
- Yellow and Green questions could be split between groups, i.e. yellow questions for group A and Green questions for Group B.
- Indicative times per question are shown to indicate relative importance of the question.

<p>These travel surveys are likely to be repeated in the future. How do you feel about being asked questions relating to service quality? <b>&lt;1 min</b></p>
<p>Value as a customer: <b>3 min</b></p> <p>(i) How do you know if you are valued as a customer in a public transport service?</p> <p>(ii) How do you know if you are not valued as a customer in a public transport service?</p>
<p>Using Business Express: <b>3 min</b></p> <p>(i) What made you decide to start using the Business Express service?</p> <p>(ii) How has your lifestyle changed, if any, since you used the service? <i>(Apart from traffic congestion is there anything else?)</i></p>
<p>The following three questions relate to the way you travel between Pretoria and Johannesburg (please provide answers for each): <b>2 min</b></p> <p>(i) Do you have any other way of travelling to Pretoria/Johannesburg (e.g. taxi, bus, sharing a car ride)?</p> <p>(ii) How often do you use these alternatives?</p> <p>(iii) Why aren't you using any of them today?</p>
<p>Dissatisfaction experiences with a public transport service that <b>you used</b> (please provide answers for each if you can): <b>3 min</b></p> <p>(i) Tell me about a time when you were dissatisfied with the public transport service that you were using (<b>not</b> Business Express).</p> <p>(ii) How dissatisfied were you?</p> <p>(iii) What caused the dissatisfaction?</p> <p>(iv) How did you respond immediately?</p> <p>(v) How did you respond after a long while?</p>
<p>Dissatisfaction experiences with the Tshwane Business Express (please provide answers for each if you can): <b>3 min</b></p> <p>(i) Tell me about a time when you were dissatisfied with the Tshwane Business Express service.</p> <p>(ii) How dissatisfied were you?</p>

(iii) What caused the dissatisfaction? (iv) How did you respond immediately? (v) How did you respond after a long while?			
<b>I am now going to ask you about specific service quality attributes of the service. For each service attribute I will explain what I am referring to and I will then ask you in practical terms what it means to you and how important it is for your satisfaction as a Business Express customer.</b>			
Description of service design characteristic	Question (i): How satisfied are you with it now? (Let them use their own measure to express level of satisfaction.)	Question (ii) How important is it to you and why? (Let them use their own measure of importance.)	Question (iii) What is the level of performance that would stop you from using the service?
<b>Reliability</b> shows the ability of a transport service to be at specific places and at times known and communicated to you (for example, departure and arrival times at stations). <b>3 min</b>			<i>Probe: e.g. Would you still use the service if it was 30 minutes late occasionally?</i>
<b>Security</b> refers to the level of protection against criminal activity. <b>3 min</b>			<i>Probe: e.g. Would you still use the service if say 10 incidents were reported every month?</i>
<b>Safety</b> refers to protection against harm caused by accidents and equipment malfunctioning. <b>3 min</b>			<i>Probe: e.g. Would you still use the service if say 10 incidents were reported every month?</i>

<p><b>Climate control</b> refers to the comfort levels as a result of temperature and air quality within the vehicle/train. <b>3 min</b></p>			<p><i>Probe: e.g. How do you cope when it is very cold or very hot?</i></p>
<p><b>Payment convenience</b> refers to the ability to pay for the fare using different means of payment, for example debit cards, credit cards, internet and cash. <b>3 min</b></p>			<p><i>Probe: e.g. How would you feel if you queued all the time to purchase a ticket?</i></p>
<p><b>Speed of travel</b> refers to the amount of time to move from station to station. <b>3 min</b></p>			<p><i>Probe: e.g. How would you feel if the train stopped at all the stations?</i></p>
<p><b>Frequency</b> refers to the number of services available between your journey's origin and destination in any given hour of the day. <b>3 min</b></p>			<p><i>Probe: e.g. How many services in a day do you think are necessary to increase your satisfaction?</i></p>
<p><b>Time to nearest stop</b> is the time between your origin/destination and the public transport route/stop/station. <b>3 min</b></p>			<p><i>Probe: e.g. How would you feel if it took you an hour to access the station?</i></p>
<p><b>Transfer</b> is the physical movement of a passenger from one type of transport or route to another in order to complete a journey that one of them is unable to completely provide. <b>3 min</b></p>			<p><i>Probe: e.g. Would you still use the service if you transferred more than 3 times?</i></p>
<p><b>Crowdedness</b> refers to increased number of people within a given space in the vehicle/train. <b>3 min</b></p>			<p><i>Probe: e.g. Would you still use the service if standing passengers were allowed?</i></p>

<p><b>Information quality</b> refers to the usefulness and timing of information provided about the service prior to using or during your use of service, e.g. timetables and announcements of changes to service plans. <b>3 min</b></p>			<p><i>Probe: e.g. How would you feel if you were provided with emergency reaction/evacuation information every time you came on-board?</i></p>
<p><b>Cleanliness</b> refers to the degree of absence of rubbish, and dirt in/on the vehicle/train and at stations. <b>3 min</b></p>			
<p><b>Staff friendliness</b> refers to the degree of pleasantness with which the staff members of the service interact with you. <b>3 min</b></p>			<p><i>Probe: e.g. Would you still use the service if there were no hostesses in the coaches?</i></p>
<p><b>The next set of questions probes on attributes that are usually unavailable/ignored in the design of public transport services.</b></p>			
<p><b>Question</b></p>	<p><b>Probing examples</b></p>		
<p>How do you feel about mixing with people from different backgrounds in terms of values, race and social standing? <b>2 min</b></p>	<p><i>What level of mixture, if any, would stop you from using the service?</i></p>		
<p>How would you feel if bicycles were allowed inside the vehicle/train for other people or for you to use instead of cars as a connecting mode? <b>2 min</b></p>			
<p>How would you feel if your seat was reserved even if you were not present? <b>2 min</b></p>			

<p>How important is entertainment in the form of television and radio to you while travelling between Pretoria and Johannesburg?  <b>2 min</b></p>	<p><i>What content would be appropriate to you?</i></p>
<p>How important is the provision of newspapers on board? What content/variety is important to you?  <b>2 min</b></p>	<p><i>How would you react if these were not provided anymore?</i></p>
<p>Is there a fare level you would consider too expensive for the current Business Express service?  <b>2 min</b></p>	<p><i>What is the order of magnitude?</i></p>
<p>What are your thoughts, if any, with regard to the ability to use your ticket for other available modes of transport?  <b>2 min</b></p>	
<p>What are your thoughts with regard to on-board conversations with strangers while travelling?  <b>2 min</b></p>	
<p>What are your feelings regarding moving your home closer to a public transport station/route?  <b>2 min</b></p>	
<p>How would you feel if public transport routes and stations were located closer to your place of residence and your frequent destinations?  <b>2 min</b></p>	
<p>What are your feelings regarding moving your home closer to your frequent commute destination, for example work or school?  <b>2 min</b></p>	
<p>How important is the ability to choose your seat?  <b>2 min</b></p>	<p><i>How would you use such a ticket in your current situation?</i></p>
<p>How important is the ability to voice your complaints to the service provider?  <b>2 min</b></p>	<p><i>How would you feel if you could only voice your complaints to different departments or agencies and not a centralised body?</i></p>



How do you feel about people using mobile phones close to you while travelling? <b>2 min</b>	
What are your thoughts, if any, with regard to interior furnishings of a public transport vehicle? <b>2 min</b>	
What generally uncommon amenities are important for your satisfaction in a public transport service? (e.g. beverages and refreshments, internet connection) <b>2 min</b>	<i>How would you react if these were not provided anymore?</i> <i>How would you react if you had to pay for these extra services?</i>
Are any of the service characteristics we discussed more important to you now than they used to be say a year ago? If so, can you tell me why? <b>5 min</b>	
Are there any other service attributes that have been left out of the discussion that you consider important for your satisfaction? <b>5 min</b>	

### 11.3 QUALITATIVE QUESTIONNAIRE FOR NON-USERS OF TSHWANE BUSINESS EXPRESS

**The moderator is made aware of the following:**

- This questionnaire is prepared for the non-users of the Tshwane Business Express. The target market is typically people in LSM 7 and above, who can use the service but are not doing so. It would be ideal to locate those people who used the service but no longer do so.
- The participants must be **regular commuters**, must have **used public transport in the past** and must have the **same travel patterns as the Tshwane Business Express users**.
- Questions probe as much as possible the relationship between service and customer satisfaction.
- Please reassure the respondents that every answer and word counts and that they should not hold back any response.
- It is also important to understand what personal circumstances (or changes in personal circumstances) might have contributed to certain responses. In a group environment this aspect may be difficult to probe due to sensitivity about personal issues; nonetheless, it needs to be probed.
- Given that there will be more time spent with the non-users than users, and that there is smaller sample, all the questions need to be asked.

These travel surveys are likely to be repeated in the future. How do you feel about being asked questions relating to service quality?			
Value as a customer: (i) How do you know if you are valued as a customer in a public transport service? (ii) How do you know if you are not valued as a customer in a public transport service?			
The following three questions relate to the way you travel between Pretoria and Johannesburg (please provide answers for each): (i) How do you currently travel between Pretoria and Johannesburg? (ii) Do you have any other way of travelling to Pretoria/Johannesburg? (iii) How often do you use these alternatives, if any?			
Dissatisfaction experiences with a public transport service that <b>you used</b> (please provide answers for each if you can): (i) Tell me about a time when you were dissatisfied with the public transport service that you were using ( <b>not</b> Business Express). (ii) How dissatisfied were you? (iii) What caused the dissatisfaction? (iv) How did you respond immediately? (v) How did you respond after a long while?			
In your opinion, what would need to happen for you to change the way you travel and use a service such as the Tshwane Business Express?			
<b>I am now going to ask you about specific service quality attributes about your preferred way of travelling between Pretoria and Johannesburg. For each service attribute I will explain what I am referring to and I will then ask you in practical terms what it means to you and how important it is for your satisfaction as a traveller.</b>			
<b>Description of service design characteristic</b>	<b>Question (i): How satisfied are you now with the way you travel?</b>	<b>Question (ii) How important is it to you and</b>	<b>What are your perceptions of this aspect on Business Express Service in comparison</b>

	(Let them use their own measure to express level of satisfaction)	why? (Let them use their own measure of importance)	to how you travel now?
<b>Reliability</b> shows the ability of a transport service to be at specific places and at times known and communicated to you (for example, departure and arrival times at stations).			
<b>Security</b> refers to the level of protection against criminal activity.			
<b>Safety</b> refers to protection against harm caused by accidents and equipment malfunctioning.			
<b>Climate control</b> refers to the comforts levels as a result of temperature and air quality within the vehicle.			
<b>Payment convenience</b> refers to the ability to pay for services using different means of payment, for example debit cards, credit card, internet and cash.			
<b>Speed of travel</b> refers to the amount of time to move from your origin (point of departure) to your destination.			
<b>Frequency</b> refers to the number of services available between your journey's origin and destination in any given hour of the day.			
<b>Time to nearest stop</b> is the time between your origin/destination and the public transport route/stop/station.			
<b>Transfer</b> is the physical movement of a passenger from one type of transport or route to another in order to complete a journey that one of them is unable to completely provide.			

<b>Crowdedness</b> refers to increased number of people within a given space in the vehicle/train.			
<b>Information quality</b> refers to the usefulness and timing of information provided about the service prior to using or during your use of service, e.g. timetables and announcements of changes to service plans.			
<b>Cleanliness</b> refers to the degree of absence of rubbish, and dirt in/on the vehicle/train and at stations.			
<b>Staff friendliness</b> refers to the degree of pleasantness with which the staff members of the service interact with you.			
<b>The next set of questions probes on attributes that are usually unavailable/ignored in the design of public transport services.</b>			
Question	Probing examples		
How do you feel about mixing with people from different backgrounds in terms of values, race and social standing?	<i>What level of mixture, if any, would stop you from using the service?</i>		
How would you feel if bicycles were allowed inside a public transport vehicle/train for other people or for you to use instead of cars as a connecting mode?			
How would you feel if your seat was reserved even if you were not present?			
How important is entertainment in the form of television and radio to you while travelling between Pretoria and Johannesburg?	<i>What content would be appropriate to you?</i>		
How important is the provision of newspapers on board? What content/variety is important to you?	<i>How would you react if these were not provided anymore?</i>		
Is there a public transport fare level you would consider too expensive between Pretoria and Johannesburg?	<i>What is the order of magnitude?</i>		
How important is the ability to choose your seat on public transport?			

What are your thoughts with regard to on-board conversations with strangers while travelling?	
What are your feelings regarding moving your home closer to a public transport station/route?	
How would you feel if public transport routes and stations were located closer to your place of residence and your frequent destinations?	
What are your feelings regarding moving your home closer to your frequent commute destination, for example work or school?	
What are your thoughts, if any, with regard to the ability to use your ticket for other available modes of transport?	<i>How would you use such a ticket in your current situation?</i>
How important is the ability to voice your complaints to the service provider?	<i>How would you feel if you could only voice your complaints to different departments or agencies and not a centralised body?</i>
How do you feel about people using mobile phones close to you while travelling?	
What are your thoughts, if any, with regard to interior furnishings of a public transport vehicle?	
What generally uncommon amenities are important for your satisfaction in a public transport service? (e.g. beverages and refreshments, internet connection)	<i>Would you start using Business Express if these were provided?</i>
Are any of the service characteristics we discussed more important to you now than they used to be say a year ago? If so, can you tell me why?	
Are there any other service attributes that have been left out of the discussion that you consider important for your satisfaction?	