CHAPTER ONE

INTRODUCTION

1.0 Background of the study

This study deals with the evaluation of customer satisfaction and service quality in Malaysian highway. The concept of customer satisfaction has drawn the interest of academics and practitioners for more than three decades in the light of the fact that customers are the primary source of most firms’ revenue without the emergence of consensual definition of the concept. Conventional traditional wisdom holds the attending to customer satisfaction makes good business sense for at least two reasons:

a. Satisfied customers are likely to continue to buy from and/or continue to do business with a company, while dissatisfied customers are likely to take their business elsewhere.

b. Satisfied customers tell others about their positive experiences, while dissatisfied customers tell even more people about their negative experiences.

In today’s world of globalization, the provision of infrastructures of which highway network plays an important role, is essential to enhance the nation’s competitiveness and maintain an edge over its competitors. The development of automobile has changed the function of a road from facility provider mainly for commerce to a public utility serving all mankind. As to support the impressive industrial and social development, the demands for a better transportation network are growing tremendously.
The road users in Malaysia have become more educated, better informed, more internalized and as Malaysian economy become more and more knowledge based, their demand for high quality services expends with the increase in customers’ buying power. They need not only required a safe road but also convenient place for travelling and stop by for nature calls. These concessionaire companies are trying their best to fulfil road users satisfactions but still insufficient to accommodate their demands. Delivering service quality to satisfy the customers need is considered an essential strategy for success and survival in today’s competitive environment (Parasuraman et al, 1985). Thus, this study is aimed at evaluating the service quality that satisfying the needs of the highway user using modified instrument to measure the quality of the current service provided by the highway service provider.

1.1 Problem statement

Customers satisfaction and quality has become watchword for virtually all business, domestic and foreign, because of increasing competition and more demanding customers. Customer satisfaction is determined by defining customer perceptions of quality, expectations and preference (Barsky, 1992). To attain true customer satisfaction companies need to achieve quality not only by eliminating the causes for direct complains but need to provide their products or services with excellent, attractive quality – provide the delight to the customer. So research on customer satisfaction is often closely associated with the measurement of service quality (Cronin and Taylor, 1992; Bitner and Hubbert, 1994).
Famous comments by our Prime Minister during his Keynote address to the Oxbridge Society of Malaysia on 6 March 2003 “Competing For Tomorrow’ is ‘……the malaise affecting Malaysia that may well jeopardise our way forward is a case of having first world infrastructure and third world mentality from poor execution and inept management to shoddy maintenance and appalling customer service, Malaysia is in danger of possessing the hardware, but little software……’ (NST, 2003). This comment not only focused on the low maintenance of facilities at government building areas but also the private buildings, inevitably give indirect impact on the maintenance of the highways. NGO’s is also urged to play crucial role as watchdog to ensure the maintenance of the buildings and its facilities is up to the standard. North-South Expressways (NSE) the longest highway in Malaysia managed by Projek Lebuhraya Utara Selatan (PLUS) gives full commitments in providing the best service to satisfy its customers/road users.

Although PLUS has provided top notch facilities to their road users, complaints are still received from several quarters of the road users. They demand for more facilities provided at several locations, additional kiosks, better maintenance and safety on the roads. These complaints usually arise during festive seasons when majorities of urban dwellers return to their hometown. Complaints from various sectors through media and press give these companies a headache. Malaysian Highway Authority (MHA), as the monitoring body to ensure the maintenance and upkeep of the highways is up to the standards, has carried out daily routine inspections accordingly. Customer surveys have been performed previously at various locations but there was apprehension regarding the validity and reliability of previous method. It is also acknowledged that an appropriate satisfaction assessment had not been administered.
Since 2004, there is no customer satisfaction survey carried out by the concessionaires or MHA. **The issue is how to measure service quality and customer satisfaction in the Highway management services.** There is no evidence that an instrument of service quality in the highway management services has ever been established. Measurement is a prerequisite for anything which is to be improved and highway management services is no exception. Thus this research is also to develop a service quality instrument for the highway management services provided by the highway maintenance provider/operators.

A recurring problem is that customers/highway user needs and dissatisfaction are discovered too late, as when the users complaints through electronic media or newspapers. According to Berry (1980), even the best service providers produce errors in service delivery. One reason for these failures is the labour-intensive nature of many services, which inevitably leads to more heterogeneous outcomes compared to mechanical production processes. Service performance variability and failures also arise from the inseparability of service production and consumption, which prevents quality inspections of most services prior delivery.

Bell (2001) urged that top criteria for improving retention are service improvements and service relationship. PLUS emphasised on the improving and upgrading the existing facilities to ensure the comfort and satisfaction of road users and customers. Million of dollars have been spent improving the existing Rest and Service areas, prayer rooms (surau), lay-bys and food-court. To provide further convenience for customers, PLUS also continue with third parties to develop more petrol stations along the expressways. The new petrol stations offer new concept with additional
amenities such as food outlets, convenience stores, toilets and prayer rooms to complement the existing Rest and Service Areas (RSA) and lay-bys. Further improvements with third party includes establishment of Wi-Fi connectivity, sports shops and rejuvenation centre and a lot more improvement is planned for future. However whether these improvements developed by the highway service provider are really perceived by the users as good intentions or satisfy their actual needs. Thus, the second issue is to determine the current status of the service quality and customer satisfaction in the highway management services and whether there is any discrepancy between the perceptions and expectations of highway users towards the service provided.

Despite the importance of measuring service quality and customer satisfaction across industries nationwide, little empirical research has been conducted in the delivery of professional practices of highway management services in Malaysia. This research is therefore, an effort to gain insight into the service quality and customer satisfaction of the highway users.

1.2 Research Questions

The problem considered in this study is how to measure customers satisfaction and service quality in the highway management services. Thus, this study will address the following research questions:

a Research question 1: What size of the gaps of expectation and perceptions towards highway management services in Malaysia of highway users?

Parasuraman et al (1988) define service quality as the gap between expectations and perception of the customers. Thus, in order to study the service in the highway
management services, it is important to be able to see the size of the gaps between the expectation and perceptions of the highway users. This is critical factor here as the bigger the size mean the more dissatisfied the highway users are and vice versa.

The rationale for this study is that service quality is a complex phenomenon and elusive construct. It can mean different things to different people. Each highway users have different background and different cultures. Thus their perceptions towards the service provided by the highway management services will differ. Secondly the needs and wants of the highway users differ from this highway user. This is due to the fact that human beings needs and wants are very complex. Knowing customers wants and needs is important because failing which service provider will only be guessing and guesswork makes dissatisfaction (Tschohl, 1996). Thus, this study wants to find out the gaps between expectation and perception of Malaysian highway users.

b. Research question 2: What is the customer satisfaction level among the highway users?

Customer satisfaction is determined by defining customer perception of quality, expectation and preferences (Barsky, 1995). Another words, 'satisfaction, or lack of it, is the difference between how customer expects to be treated and how he or she perceives being treated. A declining customer retention rate usually indicates a declining customer satisfaction rate. It behoves the company to ferret out the causes behind the increasing dissatisfaction, for if it worsens further, profits will begin to fall.

Since, the highway service provider has spent millions of dollars in improving the facilities and upgrades their infrastructures, they ought to know whether their efforts has given the benefit to the users. They also need to know which areas really satisfies
the highway users and give the impact to the improvement programmes. Thus, this study is to evaluate whether the highway users are satisfied with the service provided by the highway service provider.

### 1.3 Research Objective

The purpose of this study is to assess the level of service quality in Malaysian highways from the perspective of road users. The specific objectives were as follows:

- To examine customer’s expectation and perception of service quality provided by the PLUS Expressways using modified SERVQUAL instruments.

- To assess customers satisfaction towards service quality of Highways in Malaysia.

### 1.4 Justification of research

The justification of this study was aimed in providing the useful information needed regarding the level of customer satisfaction when using facilities along the PLUS highway.

(a) The latest customer satisfaction survey was carried out on 2004 and its historical for further reference

(b) By having latest information the management can focus on areas needed for further improve on the facilities provided, improve the current maintenance practice and not forgetting the safety of the highway users to better serve them in future.
To provide additional information whether PLUS is ready to increase its toll rates with minimum resistance.

To provide overall assessment whether their investment in improving and upgrading the facilities along the highway and its annual maintenance are justifiable.

1.5 Research Definitions

The two construct of service quality and customer satisfaction are now briefly discussed and a definition of the construct provided as used in this research. The supporting literature that discussed the definition adopted will be provided in the next chapter.

There has been debate over the distinction between service quality and customer satisfaction (Iacobucci, Ostrom & Grayson, 1996; Johnston, 1995; Oh & Park, 1997) that has revolved around the definition and sequence of the construct. In particular Oh and Parks (1997) note there has been research in which satisfaction was assumed to measure service quality whilst other research assumed they were the same construct. They continue by suggesting they are distinct constructs with some overlap (Oh & Parks, 1997).

The original definition of service quality identified it as the difference between consumer expectations and perceptions (Parasuraman, Zeithaml & Berry, 1985; 1988) although the definition is similar to that of customer satisfaction and originated the
confusion between the constructs. However, in this research service quality is defined based on the gaps models (Parasuraman et al, 1988) as:

The consumer evaluates that the service quality involves in comparison of expectation with perceptions

This definition reflects service quality is based on the disconfirmation theory. Expectancy disconfirmation theory predicts that customers will judge that quality is low if performance does not meet their expectation and vice versa.

The definition of customer satisfaction has also eluded consistency, with definitions being derived from either cognitive or emotive assessments. However, most researchers have defined customer satisfactions from a cognitive position (Oh & Park, 1997). In this research a disconfirmation approach is adopted that derives from the original specification by Oliver (1980), and customer satisfaction is defined as:

Customer satisfaction derives from the perceived service quality meeting or exceeding, previously held experience.

Customer satisfaction, in this definition, derives from the comparison between the expectations held by the customer prior to the service encounters, and formed from tangible and intangible cues, with their evaluation of the service encounters. This approach to the definition of customer satisfaction has been empirically tested in several studies and is widely accepted (Pizam and Ellis, 1999).
1.6 Organization of research

This research presentation is divided into 5 chapters that introduce the research, review the relevant research, present the conceptual basis of the research, set forth the methodology and the research design, described the analyses performed and resulting findings, and discuss and interpret the results.

Chapter 1, introduces the study and provides a general overview of the purpose, background, problem statement, need and the scope of the study. Based on the purpose of the study, problem statement and the research questions that set forth the rationale in this study are presented. Chapter 2, presents the review of the relevant literature. This chapter will be divided into several sections. The first section is introducing the general overview of the highway service provider function and its maintained facilities. The second section attempts at defining the customer’s satisfaction and service quality and examining the foundation of concept of quality. The following section develops the conceptual foundation of this study. Conceptual framework, incorporating the relevant literature, is proposed for explaining the process by highway users formulates perception of quality of a service.

Chapter 3 will discuss on the research methodology of this research. The informant methodology used is explained and its appropriateness for this research is discussed. Chapter 4 describes the data analysis performed and the resulting research findings. The last chapter 5 is the closure chapter which explore the research findings, conclusion of the study, the implication, the recommendations as well as suggestions for future research.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The purpose of this chapter is to have general perspective on the nature of highway service providers, its services and facility provided to the highway users. In addition, this chapter is to explore and summarise the related research on customer satisfaction, service quality and the conceptual framework. This literature review provided the basis for the design and development of the research instruments and its final analysis.

2.1 The Nature of Highway Service Provider

Transportation infrastructure and its provision have a significant impact on economic prosperity and its development is reflected in the economic well being of the country. Under the Eight Malaysian Plan (2001 – 2005) projection, road transportation accounts for 96% of the total passenger and goods transported in the country. In 2000, Malaysia has a road network infrastructure of 65,880 kilometres of which 76% were paved roads. Toll highway in operation totalling 1,231 km, comprised mostly of interurban highways. The first privatised road project taking off is in 1984 known as North Klang Straits By-pass implemented under the Fourth Malaysian Plan. Since then, toll highways are the preferred and popular means of travelling in the country today as it is of high standard in terms of safety and in the provision of services and facilities. In addition, toll highways have provided better accessibility and ease of travel besides offering a comfortable, faster and predictable journey.
2.1.1 Highway in Malaysia

All privatised toll highways in Malaysia is regulated by a statutory body known as Malaysian Highway Authority (MHA). The Malaysian Highway Authority was established in accordance with the Malaysian Law, Act 231, Highway Authority Malaysia (Incorporation) Act 1980. The purpose of the establishment of MHA is to supervise and execute the design, construction, regulation, operation and maintenance of highways, to improve and collect tolls, to enter into contracts and to provide for matters connected therewith. The MHA is administered by a Board, which is appointed by the Minister of Works.

Maintenance of the highways is a major aspect of toll highway operations. Through proper maintenance, the desirable level of safety can be attained. Generally maintenance of highways is categorised into routine maintenance and heavy repairs. Routine maintenance involves work which is repetitive, cyclical or periodical in nature while heavy repairs include repairs of pavement, bridges, slopes and etc.

Toll highways have been equipped with the necessary road furniture (such as delineator post, Kilometre marker, guardrail and others), signage and strategically-located lightings for the safety of users. As technology developed, traffic safety infrastructure is upgraded to improve safety features such as introduction of solar powered delineator posts and road studs as well as wire-rope guardrails. In addition, a number of initiatives, such as the 24 hour vehicle breakdown and accident services and 24-hours call centre, have been introduced in efforts to improve traffic management towards enhancing road safety.
Road development in Malaysia has taken place in accordance with plans outlined by the Government in the form of five-year plans, known as Malaysia Plans and longer-term Outline Perspective Plan. Following the implementation of the Government’s privatisation policy its Outline perspective Plans, there is currently approximately 1,230 km expressway operated under concession in Malaysia. The North-South Expressway represents approximately 69% of total expressway km operated under concession in Malaysia. Table 2.1 sets out details of other major expressways operated under concession in Peninsular Malaysia.

Table 2.1: Major Expressway and Highway Operated in Peninsular Malaysia

<table>
<thead>
<tr>
<th>EXPRESSWAY</th>
<th>APPROX. LENGTH (KM)</th>
<th>COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>KL – Karak Expressways</td>
<td>60</td>
<td>MTD prime Sdn Bhd</td>
</tr>
<tr>
<td>North-South Expressway Central Link</td>
<td>48</td>
<td>Elite Sdn Bhd</td>
</tr>
<tr>
<td>Malaysia-Singapore Second Crossing</td>
<td>45</td>
<td>Linkedua Sdn Bhd</td>
</tr>
<tr>
<td>Damansara-Puchong Highway</td>
<td>40</td>
<td>Litrak Sdn Bhd</td>
</tr>
<tr>
<td>Shah Alam Expressway</td>
<td>35</td>
<td>Kesas Sdn Bhd</td>
</tr>
<tr>
<td>Seremban- Port Dickson Highway</td>
<td>22</td>
<td>SPDH Sdn Bhd</td>
</tr>
<tr>
<td>Damansara-Kerinci Link</td>
<td>20</td>
<td>Sprint Sdn Bhd</td>
</tr>
<tr>
<td>New North Klang Straits Bypass</td>
<td>18</td>
<td>Shapadu</td>
</tr>
<tr>
<td>Butterworth-Kulim Expressway</td>
<td>17</td>
<td>KLBK Sdn Bhd</td>
</tr>
</tbody>
</table>
PLUS Expressways was incorporated in Malaysia as a public company on 29 January 2002 under the Companies Act, 1965. PLUS Expressways Berhad is a holding company which wholly owns PLUS, its subsidiary. PLUS business primarily consists of the operation and maintenance of the Expressways.

PLUS operates and maintains three interconnected expressways: The North-South Expressways (NSE), The New Klang Valley Expressways (NKVE) and a Section of the Federal Highway Route 2 (FHR2), each of which serves leading industrial, urban and residential areas in Peninsular Malaysia. The North-South Expressways is a 846–kilometre toll expressway running the length of the west coast of Peninsular Malaysia from Bukit Kayu Hitam near the border of Thailand in the north to Johore Bahru at
the border of Singapore in the south, including the Senai to Johore Bahru stretch and
the Kempas Spur Road. It also managed the Malaysia-Singapore Second Crossing
(Linkedua Sdn Bhd), Butterworth- Kulim Expressways (BKE) and the North-South
Central Link (ELITE Sdn Bhd).

The principal structural feature of the Expressways for which PLUS is responsible are
set out in the table 2.2 below:

<table>
<thead>
<tr>
<th>Structural Features of PLUS Expressway Berhad</th>
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<tbody>
<tr>
<td>NSE</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Length (km)</td>
</tr>
<tr>
<td>Toll lanes</td>
</tr>
<tr>
<td>Toll plaza</td>
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<tr>
<td>Interchanges</td>
</tr>
<tr>
<td>Tunnels</td>
</tr>
<tr>
<td>Overhead Bridge</td>
</tr>
<tr>
<td>Rest and Service Area</td>
</tr>
<tr>
<td>Layby</td>
</tr>
</tbody>
</table>

Source: PLUS Annual Reports 2007

Approximately 20% of the North-South Expressway consists of dual three-lane
expressways, and approximately 80% consists of dual two-lane expressways.
The North-South Expressways is one of the busiest toll expressways in Malaysia. According to PLUS Annual Report 2007, PLUS traffic volume increases from 342 million vehicles in 2006 to 367 million vehicles in 2007 with an increase of 7.4% total volume of vehicles. For the year ended 31 December 2007, PLUS Expressways Berhad recorded toll collections of RM 1.82 billion, an increase of RM270 million from RM1.69 billion in 2006. Profit before tax for the Group was RM 1.31 billion, or 1.8% higher than the RM1.11 billion in 2006.

2.1.3 Highway Facilities

PLUS has operates a range of facilities that enhance the convenience and improve the service levels to complement the operation of the Expressways. These ancillary facilities are an important part of PLUS services because they provide value-added services to the Expressways users. Lay-bys and Rest and Service Areas (RSA) are located at intervals of approximately every 30 km and 60 km, respectively, along the North-South Expressways. Currently there are two overhead bridges (OBR), 20 RSAs and 43 lay-bys with 9 laybys are under upgrading. These RSAs and OBR provide food and beverage stall, retail outlets, public toilets, public telephones, prayer room (sura), rest huts, parking facilities, patrol station and others. While the lay-bys provide limited facilities that include toilets, parking areas, public telephones and rest huts.
2.1.4 Highway Maintenance

PLUS’s maintenance policy seeks to preserve a high level of safety for motorists by keeping the Expressways in good condition, which also helps PLUS to comply with relevant maintenance obligations under the concession agreement and Malaysian law. PLUS has distinguished its maintenance between routine maintenance and heavy repairs. Routine maintenance involves work which is repetitive, cyclical or periodic in nature and which is performed to aid traffic flow maintain functionality and aesthetic. This includes maintenance of turf, drainage, landscaping, pavement markings, bridge parapets, right of way fences, road signs and others.

Meanwhile heavy repairs include repairs of pavement, bridges, slopes embankments, earthworks, drainage structures and tunnels to maintain safety and serviceability. Heavy repairs are carried out to maintain the structural integrity of the Expressways and to ensure the continued safety of users. PLUS has the obligation to inspect the Expressways in accordance to standard required in the concessionaire Agreements.

2.1.5 Highway Traffic Management

PLUS provides a 24-hour vehicle breakdown and accident service known as PLUS Ronda, which is free of charge to Expressways users. This service is available throughout the year, and includes 29 PLUS Ronda teams patrolling the Expressways at night and 34 teams during the day. The purpose of PLUS Ronda is to prevent secondary accidents, re-direct traffic, warn other drivers of breakdowns or accidents and provide
towing services to the nearest toll plaza, rest and service area or lay-by. PLUS Ronda’s personnel have been granted auxiliary police authority by the Royal Malaysian Police.

PLUS Ronda works in close coordination with the Expressway Mobile patrolling Vehicle (EMPV) unit of the Malaysian Police, whose personnel are dedicated to the Expressways and are based in PLUS office along the Expressways. PLUS will provide the EMPV police with information about emergency situations and traffic flow.

PLUS also operates a 24-hour call centre known as PLUSLine. PLUSLine connects users to PLUS traffic monitoring centre (TMC) in Kuala Lumpur. PLUSLine enable Expressway users to seek assistance in the event of breakdown, report traffic accidents and other incidents, provide feedback on services and facilities or make enquiries. TMC also disseminates information to PLUS Regions Communication Centres (RCC) which are located at Bertam (Penang), Subang (Selangor) and Yong Peng (Johore). Information on accidents and vehicle breakdown can also be conveyed to the RCCs through PLUS free emergency telephones, which are located at two km intervals along the Expressways. PLUS also conducts aerial surveillance by helicopter for routine inspection and traffic surveillance of the Expressways on a monthly basis and during holiday seasons.
2.2 Customer Satisfaction Research

Both public and private sectors have given much attention to the concept of customer satisfaction in the past couple of decades. Naturally, administrators have requested their staff to do customer satisfaction studies for their own organizations. In this section, the researcher elaborates on the importance of the customer that is the highway users and its perception towards the service provided by the highway service provider and their satisfaction on the service received. Consumer satisfaction provides the basis for the marketing concept and has been shown to be a good predictor of future purchase behaviour. As a reflection of its importance, consumer satisfaction is a popular topic in the marketing literature. Most models of consumer satisfaction—and service quality—maintain that discrepancies between ex ante expectations of a good or service and the product’s ex post performance are the best predictors of the satisfaction or quality perceived by the customer (e.g., Oliver 1977, 1980; Parasuraman, Zeithaml, and Berry 1985, 1988).

2.2.1 Customer

The importance of customers has been highlighted by many researchers and academicians. Zairi (2000) said customers are the purpose of what we do and rather than them depending on us, we very much depend on them. The customer is not the source of a problem, we shouldn’t perhaps make a wish that a customer should go away because our future and our security will be put in jeopardy. Customer is common terms to those that receive services or products (Hayes, 1998). Customer can
also be referred as the purchaser, the supplier, the contractor or the road user. In Highway the road user is the customer. They are the customers who pay the toll according to rates stipulated by the regulators or authorities. Any hike in toll rates (or increase in cost) will influence the road user/customer behaviour and this will affect the concessionaire its future profits.

2.2.2 Prior Experience

Prior experience, the relationship or history that a customer has with a business, moderates the customer’s service quality judgment and level of satisfaction (Oh & Parks, 1997). The satisfaction judgment a customer makes after each transaction may be a transaction-specific judgment (Bitner, 1990) or a cumulative global judgment based on multiple interactions with the firm or product (Cronin & Taylor, 1994; Iacobucci & Ostrom, 1995).

Tax et al (1998) identified prior experience as an important component of the service encounter because it influences subsequent service encounters and the future relationship between the customer and the service provider. Customers continually update their beliefs and expectations regarding a service, and with each visit they integrate new information with their existing knowledge about the provider. Each service encounter yields a service quality judgment that results in updated expectations for the next visit. Aaker (1991) adapted two belief-updating processes to analyze customer dissatisfaction with complaint handling, and in each case the mitigating effect of prior experience (or lack thereof) was demonstrated.
Woodruff, Cardotte and Jenkins (1983) argued that expectations are norms based on experience with the product. Zeithaml et al. (1990) provided support for the theories that expectations vary with the consumer and are formed from past experiences with and word-of-mouth and advertisements about a firm. Comparisons have been viewed as being made against six types of expectations: ideal (Miller, 1977), desired (Spreng & Olshavsky, 1993; Zeithaml et al., 1993); equitable and ideal outcomes (Tse & Wilton, 1988), values (Westbrook & Reilly, 1983), acceptability (Miller, 1977; Zeithaml et al., 1993), and a should-be (Boulding, Kalra, Staelin, & Zeithaml, 1993). These six expectation types are represented in six different customer satisfaction models. Recent work has begun to accept all six models as valid, recognizing that customers hold multiple expectations simultaneously (Spreng, MacKenzie, & Olshavsky, 1996).

After Westbrook and Oliver (1981) extended the traditional customer satisfaction paradigm to consider the affective role, Oliver and Swan (1989) introduced five different types of satisfaction evoked by feelings: 1) contentment (acceptance or tolerance), 2) pleasure (an evoked positive experience ending with happiness), 3) relief (aversive state is removed), 4) novelty (interest or excitement due to expected or unexpected events), and 5) surprise (delight or outrage due to far exceeded or unmet expectations).

Regardless of how customers form expectations or arrive at satisfaction conclusions, all customers have expectations (Tse & Wilton, 1988). Expectations change as encounters with a firm change. Meeting or exceeding these evolving expectations determines the financial success of a firm (Fornell, Anderson, & Lehman, 1994).
2.2.3 Customer Satisfaction

Satisfactions come from the Latin words satis (enough) and farcere (to do or make) Oliver, (1980). The concept of customer satisfaction has drawn the interest of academics and practitioners for more than three decades in the light of fact that customers are the primary source of firm’s revenue without the emergence of the consensual definition of concept. Churchill and Suprenant (1992) define customer satisfaction as an outcome of purchase and use resulting from buyers’ comparison of the rewards and costs of the purchase in relation to the anticipated consequences. It also has been viewed as an emotional state that occurs in response to the evaluation of a service (Westbrook, 1981). The former conceptualization recognises that satisfaction is determined by a cognitive process of comparing what customers receive (rewards) against what they give up to acquire the service (costs), whereas the latter view satisfaction as an emotional feeling resulting from evaluation process. Consistent with this view, customer satisfaction is defined as an emotional response, which results from a cognitive process of evaluating the service received against the cost obtaining the service (Woodruff et al.,1991; Rust and Oliver, 1994). Satisfaction is an emotional or feeling reaction. Moormann (2000) defines satisfaction as a positive feeling about a particular entity. Rust et al (1996) define satisfaction as how customer perceives service and how they feel about it. This is because customer decisions take place in the customers mind. Oliver (1991) defines consumer satisfaction as the overall attitude towards a good or services after they have acquired and used it. It is post choice evaluative judgement resulting from a specific purchase selection and the experience of using/consuming it.
Customer satisfaction theories are based on the social and experimental psychological studies carried out by Hoppe (1930) and Lewin (1936) in the first half 20th Century. Investigating the self-esteem construct (and self confidence), these scholars discovered the foundation of the confirmation/disconfirmation paradigm useful to explain the satisfaction perception and the link between satisfaction and trust. The first conceptualisation of customer satisfaction in marketing studies (Cardozo, 1965; Hunt, 1977; Oliver, 1977 and 1980; Olson and Dover, 1979) came without explicit reference to the Lewin (1936) experiments. The research was concentrated into the determinants of satisfaction, attempting falsifying the confirmation/disconfirmation paradigm. Many experiments produced interesting evidence about antecedents and the mediating variables having a role in the customer satisfaction perception, but did not decrease the paradigm’s explanatory capacity (Yi, 1990; Iacobucci, Grayson & Omstrom, 1992; Oliver, 1997; Costabile, 1998; Fournier and Mick, 1999).

Recent developments in the study of customer satisfaction have investigated the emotional and affective components of satisfaction, and the dynamics of the construct over time (Westbrook, 1987; Oliver, 1997; Fournier and Mick, 1999). Many marketing scholars are also attempting to understand the variables between the perception of satisfaction and the choice of repurchase of a brand, or a set of brands (Oliver, 1999).

Customer satisfaction is an ambiguous and abstract concept and the actual manifestation of the state of satisfaction will vary from person to person and from product/service to product/service. The state of satisfaction depends on a number of
both psychological and physical variables which correlate with satisfaction behaviour such as return and recommend rates. The level of satisfaction can also vary depending on the other options the customer may have and other products against which the customer can compare the organization’s products. Consumer’s feeling about the consumption experiences will effect their evaluations of the product independently of the actual quality of the product. Post-purchase evaluation of products is closely related to the development of feelings by satisfaction or dissatisfaction with the exchange process.

According to Kotler (2000) satisfaction is a person’s feelings of pleasure or disappointment resulting from comparing a product’s perceived performance (outcome) in relation to his or her expectations. Satisfaction is a function of perceived performance and expectations. If the performance falls short of expectations, the customer is dissatisfied. If the performance matches the expectations, the customer is satisfied. If the performance exceeds expectations, the customer is highly satisfied or delighted. To exceed the expectations of the customer, the service provider has to go above and beyond the basics of customer service. Gatewood and Riordan (1977) equate satisfaction with meeting the customers’ needs and expectations by delivering goods and services to the satisfaction of the customer. Exceeding those expectations and making it delightful experience rather that just a satisfying one can broaden the level of satisfaction.
Kotler (2000) has described four methods companies use to track customer satisfaction through:

a. **Complaint and suggestion system**

   Organization makes it easy for its customers to deliver suggestions and complaints by establishing toll free hotlines, web pages and e-mails. These information flows provide companies with many good ideas and enable them to act quickly to resolve problem.

b. **Customer satisfaction survey**

   Responsive companies measure customer satisfaction directly by conducting periodic surveys. They also solicit buyer’s views on their competitors’ performances. This survey is also useful to measure the likelihood or the willingness of customers to recommend the company and brand to others.

c. **Ghost shopping**

   Companies do hire persons to pose as potential buyers to report on strong and weak points experience in buying the company’s and competitor’s products.

d. **Lost customer analysis**

   Companies contact customers who has stopped buying or who has switched to another supplier to learn why this happened.
There are many factors that affect customer satisfaction. According to Hokanson (1995) these factors include friendly employees, helpful employees, accuracy of billing, billing timelines, competitive pricing, service quality, good value, billing clarity and quick service. In order to achieve customer satisfaction, organizations must be able to satisfy their customer needs and wants (La Barbera and Marzurky, 1983). Customers’ needs state the felt deprivation of customer (Kotler, 2000). Whereas customers’ wants, according to Kotler (2000) refers to the form taken by human needs as they are shaped by culture and individual personality.

There can be a great difference between the customers who are satisfied and those very satisfied. Companies can lose anywhere between 10 and 30 percent of their satisfied customers. When asked, such customers might say they were satisfied but found another supplier who could satisfy them more. Smart companies therefore aim not only to satisfy their customers but also to delight them. Kotler et al (1999), argued that satisfaction is not a universal phenomenon and not everyone gets the same satisfaction out of the same hospitality experiences. That calls for exceeding customer expectations, not just meeting them. This is because customer decision takes place in customer’s mind; therefore the focus is on the perception as well as emotional responses and not just reality. Such feeling if positive can be range from mild (satisfaction) to extreme (delight) as illustrated as Figure 2.1.
Customer satisfaction can also be defined as satisfaction based on an outcome or a process. Vavra’s (1994) outcome defined customer satisfaction characterizes satisfaction as the end-state resulting from the experience of consumption. This end state may be a cognitive state of reward, an emotional response to an experience or comparison of rewards and costs to the anticipated consequences. Vavra (1994) also put forth a definition of customer satisfaction based as a process, emphasizing the perceptual, evaluative and psychological processes contributing to customer satisfaction. In this definition, assessment of satisfaction is made during the service delivery system.

Customer satisfaction measurement serves two roles, providing information and enabling communication with customers. Perhaps the primary reason for taking the time to measure customer satisfaction is to collect information, either regarding the
customers say that needs to be done differently or to assess how well an organization is currently meeting its customer needs (Vavra, 1994). A secondary, but no less important function of customer satisfaction measurement in service industries, is that by surveying customers, an organization is demonstrating its interest in communicating with its customers – finding out their needs, pleasures and displeasures and overall well-being. Though it is impossible to measure the satisfaction of every single customer, those whose opinions are solicited and others, who observe this process, are given a sense of importance and recognition.

Numerous studies and publications have almost concluded that customer satisfaction can lead to several benefits for the organizations applying it:

- Customer satisfaction can be used to discover important strengths and weaknesses in product/service offerings and more effectively focus improvement efforts towards these issues (Lin & Jones, 1997; Emerson & Grimm, 1999)

- Depending on the industry context, customer satisfaction may be used to estimate the degree of customer loyalty which is vital for long-term revenues (Gronholdt et. al, 2000)

- Customer satisfaction measure enables the supplying organization to compare the performance of its different business units in different time periods and locations (Jones & Sasser, 1995).

- Customer satisfaction measure is useful for assessing the effectiveness of efforts to redesign elements of the service delivery system (Chase & Bowen, 1991)

- Customer satisfaction can be used as a basis for customer segmentation (Athanassopoulos, 2000).
• According to McColl-Kenedy and Schneider, 2000, measuring customer satisfaction is not a neutral act, but an intervention. The opinions of the customer whose satisfaction is measured can be affected by the measurement process.

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• According to McColl-Kenedy and Schneider (2000), measuring customer satisfaction is not a neutral act, but an intervention. The opinions of the customer whose satisfaction is measured can be affected by the measurement process.
2.2.4 Delight

Customer delight has been defined as the pleasant surprise experienced by the customer as a result of unexpected value or unanticipated satisfaction (Chandler, 1989). Chandler (1989) proposed that customer delight is related to loyalty and suggested that delight is a competitive advantage for the firm that consistently delivers delightful service. Delight goes beyond and has been measured differently from customer satisfaction (Oliver, 1999). For example, when Ford Motor Company authorized service departments to fix certain breakdowns of a car as if under warranty even after the warranty had expired, some customers were delighted (Berry & Seiders, 1998). Delight addresses very positive states of emotions. Researchers have referred to delight as pleasant surprise (Westbrook & Oliver, 1991) and positive affect (Mano & Oliver, 1993; Oliver, 1993).

2.2.5 Disappointment and Defection

Disappointment is a deeper affective state or a more extreme dissatisfaction felt when things go differently than expected (Zeelenberg & Pieters, 1999). Zeelenberg and Pieters presented a disappointment model detailing that the emotion of disappointment (one of 32 emotions identified by Frijda, Kuipers, & Schure, 1989) is important to services marketing researchers because disappointment and regret are related to decision making (Inman, Dyer, & Jia, 1997). Research into the relationship between disappointment and the behavioural intentions of complaining, engaging in negative word-of-mouth communications and defecting showed more disappointed
customers complaining and engaging in negative word-of-mouth but not more defecting. This confirmed past studies (Inman et. al., 1997).

Defection is a falling away from loyalty or habit in buying behaviour (Heskett et al., 1997). It is the final behavioural response that dissolves the relationship between customer and service provider. Defection has been shown to lead to reduced market share, low profitability, and increased cost (Reichheld & Sasser, 1990; Rust & Zahorik, 1993; Rust, Zahorik, & Keiningham, 1995). Studies have linked switching behaviour to service failures in retail stores (Kelley et al., 1993) and to dissatisfaction in the insurance industry (Crosby & Stephens, 1987). Research focused on quality, satisfaction, or service encounters has yielded only partial information about defecting behaviour.

Extremely satisfied customers usually do not defect (Jones & Sasser, 1995). However, even customers who communicate their satisfaction do defect (Liljander, Roos, and Strandvik, 1998; Roos, 1999). Some natural rate (attritive) defection occurs due to factors beyond the control of the provider. This study refers to defection that is not natural rate defection and that could possibly be avoided or revoked by applying improved business behaviours as nonattritive defection. Both satisfied and dissatisfied customers defect attritively and nonattritively. Keaveney (1995) presented three categories of reasons for nonattritive defection: 1) price (high, increase, unfair, or deceptive), 2) inconvenience (location, hours of operation, too long for appointment, waited too long), and 3) core service failures. She identified mistakes, billing errors, and service catastrophes as the subcategories of core failures. Twenty percent of the respondents in Keaveney’s study who switched mentioned inconvenience. Forty-four
percent of Keaveney’s respondents said their defection was related to core service failures. Thirty-four percent defected due to personal interactions with the service provider.

Roos (1999) categorized defection as revocable and irrevocable by applying the attributes of relationship length, switching determinants (push, sway, and pull), emotions, voice, and length of process. Irrevocable defections were characterized by medium relationship length, being pushed from the provider by product and service failures, the experience of strong emotions, having complained often with no response, and having taken between 2 and 4 months to make the decision to defect. Smith and Bolton (1998) disclosed that long-time customers want no failures. Loveman (1998), Rust and Zahorik (1993), and Solnick and Hemenway (1992) have indicated that dissatisfied customers have a higher likelihood of defecting than satisfied customers.

2.3 Service Quality Research

Delivering high quality services has been recognised as the most effective means by which a service company’s can create a competitive edge from the competitors (Parasuraman et al, 1991). Studies have also demonstrated the strategic advantage of delivering superior quality to market share as well as profits (Gronross, 1988). Research on services has grown correspondingly. In particular, academics and practitioners alike have exhibited considerable interest in the issues that surround the measurement of service quality. Service quality is one of the major issues facing operations managers (Gupta and Chen, 1995) but it is an area characterised by debate
concerning the need for assessing customer expectations and service quality assessment ( Parasuraman et al., 1994). Service marketing literature in general and service quality in particular is still evolving and not achieves the maturity stage yet, thus this study is aimed at exploring the service quality in the Highway management services which is still lacking behind and need further explored.

2.3.1 Service Quality

Services are generally defined as commodities that cannot be stored or disappear in use, or as activities that require personal contact (Sasser et al. 1978). The distinct characteristics of services are intangibles, perishability, heterogeneity of the products, and inseparability of production and consumption (Zeithaml et al, 1985; Rust et al, 1996). Two economic units are required for a service to be produced – the consumer and the producer (Hill, 1987). While the consumer cannot retain the actual service after it is produced, the effect of the service can be retained. Managing a service operation requires the manager to understand the service concept, service delivery system and service levels. As the customer has a key role in the definition and evaluation of all three elements, it is imperative that service managers have clear understanding of customer expectations and perceptions (Sasser et al. 1978).

Services may be provided by private or public agencies (Daniels, 1985). Managers in the service sector are under increasing pressure to demonstrate that their services are customer focused and that continuous performance improvement is being delivered. Given the financial and resource constraints under which service organizations must manage it is essential that customer expectations are properly understood and
measured and that, from the customers’ perspective, any gaps in service quality are identified. Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring it with no overall consensus emerging on either (Wisniewski, 2001). There are a number of definitions as to what is meant by service quality. One that is commonly used defines service quality as the extent to which a service meets customers’ needs or expectations (Lewis and Mitchell, 1990; Dotchin and Oakland, 1994; Asunboteng et al., 1996; Winiewski and Donelli, 1996).

The credit for heralding the service quality research goes to Parasuraman, Zeithaml and Berry (Parasuraman et al., 1985, 1988; Zeithaml et al., 1985, 1990). The authors, based on qualitative research, formulated a measure of service quality derived from data on a number of services, instead of counting on earlier dimensions of goods quality in the manufacturing sector.

Globadian et al (1994) posit that most of the service quality definitions fall within the customer led category. Juran (1999) elaborates the definition of customer led quality as features of products which meet customer’s needs and thereby provide customer satisfaction. Gronroos (1984) and Parasuraman et al (1988) look at perceived quality service as the difference between customers expectation and their perceptions of the actual service received. If expectations are greater than performance, then perceived quality is less than satisfaction and hence customer dissatisfaction occurs (Parasuraman et al 1985; Lewis and Mitchell, 1990). Service quality can thus be defined as the difference between customer expectations of service and perceived service.
Service quality has been reported as having apparent relationship to costs (Crosby, 1979), profitability (Buzzel and Gale, 1987), customer satisfaction (Boltan and Drew, 1991; Boulding et al, 1993), customer retention (Reichheld and Sasser, 1990), behavioural intention and positive word-of-mouth.

Mendzela and Craig (1999) believed that there are four steps or ideas to assess in planning successful service. These include exploring values, empowering people, providing information and achieving consistency across the experience. Exploring values means understanding customer’s values and what they feel is valuable in a positive experience includes prestige, convenience and quality. Secondly, empowering employees enables them to perform at their best ability. The third step is providing information to the customers to better understand the customers are getting what they expect. Finally, achieving consistency across the chain of customer service better solidifies the customer-organization relationship, because the customer service chain is only strong on its weakest link.

2.3.2 Relationship between Satisfaction and Service Quality

Satisfaction is defined as a customer’s perception of a single service experience, whereas quality is the accumulation of the satisfaction for many customers over many service experiences. Such post-evaluation experiences perhaps lead over time to a more general attitude. Moreover, service is equal to the perception of a single service as received and measured against the expected service received. The difference in the degree, direction and discrepancy between perceptions and expectations of a customer result in a level of satisfaction or dissatisfaction (Hill, 1992).
Customer satisfaction is the degree to which a customer perceives that an individual, firm or organization has effectively provided a product or service that meets the customer’s needs in the context in which the customer is aware of and or using the product or service. Rust & Oliver (1994) argued that quality is subordinate to satisfaction. Parasuraman et al (1988) viewed perceived service quality as the degree and direction of discrepancy between consumer’s perception and expectation. Cronin and Taylor, 1992 and Woodside et al, 1989 concluded that service quality appears to be casual antecedent of consumer satisfaction.

The relationship between customer satisfaction and quality can be explored by using Gronroos (1984) quality dimensions. In his work, Gronroos determines the technical quality of the service process that the customer is left with when the service production process and its buyer-seller interactions are over. Customers can often measure this dimension relatively objectively because of its technical nature. The service dimension is another quality dimension, which has been used in literature as a functional or process quality of the process. The customer is also influenced by how he receives the service and how he experiences the simultaneous production and consumption process.

However, in the literature three theoretical conclusions can be found regarding the relation between satisfaction and (service) quality. First, (service) quality is understood as an antecedent of customer satisfaction (Peyrot et al, 1993 and Woodside et al, 1989). According to this interpretation, (service) quality is equated with the customer’s appraisal of a concrete product or service experience (Gotlieb et
al., 1994). Consequently, it does not include expectational aspects, whereas satisfaction is based on the (dis-) confirmation of expectations associated with the service or product experience.

Second, both constructs are treated as one and the same. According to this approach no significant theoretical difference between satisfaction and (service) quality exists (Gummesson, 1987; Spreng and Singh, 1993). As with the first interpretation, the aforementioned divergences concerning the higher stability of quality perception and the emotional dominance of satisfaction are ignored by this approach.

The third approach is where customer satisfaction is modelled as an antecedent of quality. Following this interpretation, the product and/or service related quality perception is as seen as the higher order and more stable variable, which is built mainly on previous experiences of (dis-) satisfaction related to discrete transactional episodes (Bitner, 1990; Bitner and Hubber, 1994; Bolton and Drew, 1991, 1994). Thus, satisfaction is regarded as a short term emotional state that results from an intrapersonal comparison of the customer’s expectations with the evaluation of a single product or service encounter. This emotional state of satisfaction leads to an overall, global attitude about (service) quality (Dabholkar, 1993) which is only implicitly based on some kind of internal expectation standard. Because quality is a dynamic construct, additional consumption experiences influence and modify the existing quality perception and cause changes in this perception (Thompson and Getty, 1994). In other words, multiple satisfaction evaluations contribute to an overall quality evaluation.
In this research, it follows what Rust et al (1996) has clearly illustrated in the relationship between perceived quality and satisfaction. It has pointed out in two different situations. As illustrated in Figure 2.2, the perceived quality is higher than expected. This situation will usually result in satisfaction. Oppositely in Figure 2.3, perceived quality is not as good as expected. In this situation will result in dissatisfaction. This disconfirmation (gaps) forms the conceptual basis for the SERVQUAL model for the service quality and satisfaction.

![Figure 2.2: Positive Disconfirmation](Source: Rust et al. 1996)

![Figure 2.3: Negative Disconfirmation](Source: Rust et al. 1996)
Rust et al (1996), also illustrates the important linkages between perceived quality from both objective quality and expectations. Expectations on the other hand have a direct effect on perceived quality. Perceived quality is then compared to expectations, resulting in a disconfirmation, either positive or negative. Perceived quality also updates the expectations to produce new expectations, which either raised (because higher than expected quality was experienced) or lowered (because lower expected quality was experienced). At the same time, satisfaction results primarily from disconfirmation, but also (secondarily) expectations. Thus, there is also a direct effect of expectations on satisfaction – the higher the expectations, the higher the satisfaction.

Satisfaction and service quality are often treated together as functions of customer’s perception and expectation. The simplest mode is the two-concept equations defined as \( Q = P - E \). There are exceptions in this model. A zone of indifference exists among some customers who have not formed an expectation or do not care about a service. But for most of the part, when perceptions (P) are equal to Expectation (E), service quality (Q) is satisfactory. If expectations are higher than actual perception, a customer’s rating becomes negative (Cottle, 1990). To improve customer satisfaction either raise customer perceptions, lower their expectations or both. Since an expectation is nothing more than an anticipation of receiving something favourable or acceptable, it is essential for any service company to develop realistic expectations among their customers. But expectation and perception are factors that are hard to control (Davidow and Uttal, 1989). They are difficult to control because perceptions and attitudes are subjective responses. They are heavily influenced by the on-going personal situations that individuals are exposed to and by competing opportunities that are as much ignored or overlooked give the dynamics of human interactions.
There are many factors that affect customer satisfaction. According to Hokanson (1995) these factors include friendly employees, helpful employees, accuracy of billing, billing timelines, competitive pricing, service quality, good value, billing clarity and quick service. This study will focus on one of the attributes of satisfaction which is service quality. This is due to the fact that service quality has become increasingly important to create service differentiation which allows competitors with similar services to provide greater value. Service quality improvement is a key competitive differentiator that is sustainable.

2.4 Conceptual Framework

The framework will provide the researcher with a guide on how to develop the service quality instrument to be implemented in this study. The development of framework has to start from an initial idea and concept. In this case of implementing service quality, one can start by trying to analyse the range of options available such as development of service quality dimensions as well as the existing models of service quality. The researcher will discussed at the service quality dimensions from various studies. Service quality is multidimensional (Parasuraman et al, 1985) and a very complex phenomenon (Gronroos, 1998). Thus this section is to identify the most suitable construct and dimensions for highway management services. The framework is illustrated as Figure 2.4 below.
Figure 2.4: Proposed Conceptual Framework

The model proposes that the service quality consist of technical and functional dimensions. The model also proposes that there are direct relationships between service quality perception and the technical construct and the quality dimensions, in addition to the indirect effects of technical and functional quality on service quality perception. The model also suggests that the service quality leads to customer satisfactions. There is theoretical support for a multi dimensional, multi level model of service quality (Dabholkar et al, 1996), but little effort has been taken to conceptualised and empirically tests such structure.

SERVQUAL was modified in the present study to reflect the nature of highway management services. Parasuraman et al (1988), indicated that such modifications were appropriate and do not represent difficulties related to the reliability and validity of the instruments. The revision includes the adding of new dimensions to reflect the highway management services. The new dimensions of the highway management
services include cleanliness, pavement conditions, road furniture, traffic management and building maintenance.

2.4.1 Frameworks for evaluating customer satisfaction with services

Many studies suggest that there is a fundamental difference between products and services, namely it is the way they are produced and consumed (Grönroos 1990; Grönroos 1998), (Edvardsson 1997; Edvardsson 2000), (Bateson and Hoffman 1999). The time period between service production and consumption is considerably shorter than for products. Most of the services are produced “on a spot” in an interactive process, in which customers and company employees meet. Satisfaction with service quality depends on a large number of dimensions - both tangible and intangible attributes of the product-service offer. The impact of intangible dimensions on consumer satisfaction is of particular interest at this point.

Many psychological studies even show that non-verbal behaviour by the service provider greatly affects service evaluation (Gabbott Mark 2000). For example, the quality of interaction between customer and service provider influences customers’ perception of service quality. In services, a single employee may affect service efficiency and consequent customer satisfaction with the service (Barnard 2002). Even customers own involvement and participation in the service delivery affect customer satisfaction (Kelly, Skinner et al. 1982). Due to the differences in production and provision of products and services, customers evaluate quality and attributes of material goods and services in different ways (Mathe and Shapiro 1993). This realisation has initiated a discussion on the need for special tools for evaluating
more diverse and less tangible services (de Brentani 1989). Responding to the
growing demands for developing specific and reliable ways to measure customer
satisfaction in service industries, a number of studies have been conducted that
suggested methodological frameworks for measuring customer satisfaction (Markovic
and Horvat 1999). Other studies looked at what measures are used by service
companies for measuring customer satisfaction. Studying how financial sector
measures customer satisfaction Edgett and Snow (1997) showed that even though it is
mostly traditional (financial) measures that are being used by the sector, they do not
provide a sufficient basis for innovation in services and multidimensional approaches
need to be devised. The two most often used types of measures in service companies
are the increase in the number of customers and increase in portfolio dollars.
However, the most useful types were direct personal interviews with customers and
measure of customer expectations and perceptions. Surprisingly, companies use
traditional quantitative measures, but perceive qualitative measures as the most useful.
Authors concluded that financial institutions are not satisfied that the traditional
accounting-type measures are presenting the full performance picture for new
products (Edgett and Snow 1997).

Customers’ satisfaction has a direct impact on relationship strength (Gronroos, 2000).
Firstly is the relationship between customer and a product/service; secondly is the
relationship between the customer and the provider of the product or service; thirdly
is the relationship between the provider(s) of a product or service and their product or
service. Satisfaction is very subjective; therefore, it is not inherent in the individual or
the product but is socially constructed response to the relationship between customer,
the product/service, and the provider.
2.4.2 The SERVQUAL model

Given the growth of services in the last decades, many researchers have recognised the need to develop measures of service quality. One of the most often used measures is the SERVQUAL based on extensive research in generic determinants of perceived service quality (Parasuraman, Berry et al. 1985; Parasuraman, Berry et al. 1988; Zeithaml, Parasuraman et al. 1990; Parasuraman, Berry et al. 1991; Parasuraman, Berry et al. 1993; Parasuraman, Berry et al. 1994). The model measures the difference between customers’ expectations about general quality of a certain group of service providers and their perceptions about the actual performance of a service provider from that group. It uses a set of service quality determinants measured by a 22-item scale. The model defines customer satisfaction as perceived service quality, which is the gap between expected service and perception of service actually received (refer to Figure 2.5). Many studies in different service industries use the model as a basis for developing surveys to evaluate customer satisfaction, which was the ambition of the authors.
Figure 2.5: Gaps Model by Parasuraman et al, 1988
Basically, the SERVQUAL model was derived from the magnitude and directions of five gaps by Parasuraman et al (1988) as Figure 2.5:

- **Gap 1 (Understanding)**: the difference between consumer expectation of service quality and management perceptions of these expectation

- **Gap 2 (Service standards)**: the difference between management perception of consumer expectations and service quality specification

- **Gap 3 (Service performance)**: the difference between service quality specifications and the service actually delivered.

- **Gap 4 (Service performance)**: the difference between service delivery and what is communicated about the service to consumers

- **Gap 5 (Service Quality)**: the difference between customer expectations of service quality and customer perceptions of the organization’s performance.

In other words, Gap 1 to 4 affects the way in which service is delivered and these four gaps lead to Gap 5. Therefore the extent of Gap 5 depends on the size and direction of these four Gaps (Gap 1, Gap 2, Gap 3 and Gap 4). The comparison between adequate service and perceive service called PSQ Gap 5, is the perceived service quality adequacy gap.

Zeithaml et al. (1993) explored the gap between expectations and perceptions to better understand expectations as they pertain to customer assessment of service quality and to extend the theoretical work that exists in the customer satisfaction literature. Based
on their study, the gap between customer expectations and perceptions as proposed by Parasuraman et al., 1985 can be conceptualised to reflect two comparison standards: desired service which indicates the standard that customers are willing to accept. The comparison between desired service and perceived service or the level of service customer believe is likely to occur, called perceived service quality (PSQ), is the perceived service superiority gap.

Parasuraman et al. (1988) developed a several measurement instrument (SERVQUAL) for assessing customer’s perceptions of service quality in service and retailing organization. These items are spread over five dimensions of tangibles, reliability, responsiveness, assurance and empathy. Perceived service quality is obtained by subtracting the expectation rating from the perception rating for each of the items.

2.4.3 Dimension in SERVQUAL Model

Boulding et al. (1993) perceived the dimensions of service quality as a function of a customer’s prior expectations of what should transpired during a service encounters, as well as the customer’s most recent contact with the service quality delivery system. These perceptions of quality dimensions form the basis for a person’s intended behaviour. Their findings suggest that the two different types of expectations have opposing effects on perceptions of service quality and that the service quality perceptions positively affect the intended behaviour.
Starting with the ten dimensions, Parasuraman et al (1988) conducted studies in several sectors to developed and refined SERVQUAL, and using factor analysis reduced the ten dimensions to five. These five new dimensions were defined as below and summarised in Table 2.3.

a **Tangibles**
According to Kotler (1999), Bitner and Zeithaml, (2003), the appearance of physical facilities, equipment, personnel and communication materials of an organization is the tangibles. Churchill and Peter (1999) added that customer look for quantity in the equipment, facilities and communication used to provide the service.

b **Reliability**
According to Kotler (1999), Bitner and Zeithaml (2003) the ability to perform the promised service dependably and accurately is the reliability. Churchill and Peter (1999) added that customers want performance to be consistent and dependable.

c **Responsiveness**
According to Kotler (1999), Bitner and Zeithaml (2003) responsiveness is the willingness to help customers and provide prompt service. Churchill and Peter (1999) added that customer must see service provider as ready and willing to perform.

d **Assurance**
According to Kotler (1999), Bitner and Zeithaml (2003) assurance means the knowledge and courtesy of employees and their ability to convey trust and confidence.

e **Empathy**
According to Kotler (1999), Bitner and Zeithaml (2003), empathy means the provision of caring, individualised attention to the customer. Key dimensions used in this study can be summarised as Table 2.3 below:
<table>
<thead>
<tr>
<th>Tangible</th>
<th>Appearance of physical facilities, equipments, personnel, and communication materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>Ability to perform the promised service dependably and accurately</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Willingness to help customers and prompt service.</td>
</tr>
<tr>
<td>Assurance</td>
<td>Knowledge and courtesy of employees.</td>
</tr>
<tr>
<td>Empathy</td>
<td>The firm provides care and individualised attention to its customers.</td>
</tr>
</tbody>
</table>

Table 2.3: Dimensions in SERVQUAL Model

While being widely applied, the SERVQUAL model has also received criticism for not including prices in the assessment or for the inclusion of expectations as a variable in measuring service quality (Boulding, Kalra et al. 1993). Perhaps the most often heard criticism pertains to the lack of a clear link between satisfaction and perceived service quality identified by some research (Duffy and Ketchard 1998). An alternative model (SERVPERF) was later developed for these reasons, based on the findings that service quality does not depend on expectations and can be directly measured by simple performance based measures of service quality (Cronin and Taylor 1994).
2.4.4 Service Quality Model

According to Grönroos (1982), the quality of a service perceived by customers will differ depends on what strategy the company chooses to deliver and promote that service. The service quality model by Grönroos holds that the quality of a service, as it is perceived by the customer, can be divided into technical quality and functional quality dimensions. The former denotes what the customer receives as the output of a service production process and the latter how the technical quality is produced and transferred to the customer during buyer-seller interactions.

Grönroos (1988) posits that the technical quality is the “basic condition for a positively perceived total quality, but the functional quality is the one that adds competitive edge” (Gummesson and Grönroos, 1987). Furthermore, in the relationship marketing, the growth of the 31 importance of functional quality in comparison to technical quality becomes a strategic one (Grönroos, 1993). The distinction is also made in the model between perceived and expected service quality and it is suggested that the quality is perceived subjectively. Grönroos, (1988) further develops the model by positing that in the case of a company, which extends product offer with services, it is more appropriate to talk about total perceived quality. According to him, a high perceived quality is obtained when the experienced quality meets customer expectations, i.e. the expected quality. However, if the expectations are unrealistic, the total perceived quality will be low, even if high quality was experienced (Grönroos, 1988). Grönroos urged that the total perceived quality is not
only defined by the level of technical and functional dimensions, but also by the gap between the expected and the experienced quality.

2.4.5 Discussion on the Proposed Researched Model

Based on the Parasuraman et al (1988) gaps model, this research will focus on the gaps 5, where it measures the perceived service against the expected service provided by the highway service provider to measure their service quality. According to Parasuraman et al (1988) the smaller the gap between adequate service and perceive service, the higher the perceived adequacy of the service. The gap 5 is simplifies as Figure 2.6 below.

![Diagram of service quality framework](image)

**Figure 2.6 : Service Quality FRAME WORK 1**

According to Gronroos (1988), in order to make a list of determinant or factors of good quality useful for managerial purposes, it has to be short enough, but still provide a comprehensive list of aspects of good quality. Therefore, for the purpose of this study the researcher has chosen Parasuraman et al (1988), ie the five service
quality dimensions as the most relevant study because it fit with the suggestion made by Gronroos (1988) the quality dimensions has been developed specifically for services, and the dimensions are derived from empirical studies and statistical analysis. Zarita (2006) demonstrates that these five dimensions will be one aspect of service quality construct that is the *functional/process construct*. Thus the suggestion of the conceptual model based on the above discussion is illustrated as table 2.7 below

![Figure 2.7: Service Quality FRAMEWORK 2](image)

As Parasuraman et al. (1988), suggest that the five (5) dimensions above are generic dimensions which are appropriate to apply in measuring Service Quality for all service sector. However, Taylor and Baker (1994), urged that the relationship of service quality is different from industry to another industry of services as mentioned by Carmen (1990). New factors should be added and taken into account based on generic and appropriateness of the services sectors.
Gronroos (1988) urged that the quality of a service, as it is perceived by the customer, can be divided into technical quality and functional quality dimensions. The technical quality is the basic condition for a positively perceived total quality. In the highway management and services, the highways and the facilities used by the road users represent the technical/outcome quality dimensions. On the other hand, the highway service provider/concessionaires who provide the management and maintenance of the services and facilities represent the functional or process dimensions. Operational highway management and services consist of two main tasks (1) the management and (2) maintenance. The management involves all the coordination of work, toll collections, supervision and other management tasks, whereas maintenance involves the outcome of the physical aspect which is the road and its facilities. Figure 2.7 below illustrate the framework and conceptual model based on the conclusion made.

![Service quality FRAMEWORK 3](image)

Figure 2.7 : Service quality FRAMEWORK 3

The technical or Outcome quality of the physical aspects is the second part of the framework which is the maintenance of the highways/roads and facilities. However, in the marketing terms, it is known as the physical evidence. Zeithaml and Bitner (2003), customers often rely on tangible cues, or physical evidence, to evaluate the service before its purchase and to assess their satisfaction with the service during and after consumption.
2.4.6 Physical Evidence

Physical evidence is defined as the environment in which the service is delivered and where the firm and the customer interact, and any tangible commodities that facilitate the performance or communications of the service (Zeithaml and Bitner, 2003). The first part of this definition encompasses the actual physical facility where the service is performed, delivered and consumed. Another part of physical evidence is also known as servicescape which includes both exterior attributes (such as signage, parking and landscape) and interior attributes (such as design, layout, equipment and décor). Physical evidence is particularly important for communicating about credence services (e.g., auto repair) and also important for services such as hotels, hospitals and theme parks that dominated by experience attributes. Table 2.4 below shows the general elements of the physical evidence.

<table>
<thead>
<tr>
<th>Servicescape</th>
<th>Other Tangibles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility exterior</td>
<td></td>
</tr>
<tr>
<td>Exterior design</td>
<td>Business card</td>
</tr>
<tr>
<td>Signage</td>
<td>Stationery</td>
</tr>
<tr>
<td>Parking</td>
<td>Billing statements</td>
</tr>
<tr>
<td>Landscape</td>
<td>Reports</td>
</tr>
<tr>
<td>Surrounding Environment</td>
<td>Employee dress</td>
</tr>
<tr>
<td>Facility interior</td>
<td>Uniforms</td>
</tr>
<tr>
<td>Interior design</td>
<td>Brochures</td>
</tr>
<tr>
<td>Equipment</td>
<td>Web pages</td>
</tr>
<tr>
<td>Signage</td>
<td>Virtual servicescapes</td>
</tr>
<tr>
<td>Layout</td>
<td></td>
</tr>
<tr>
<td>Air quality/temperature</td>
<td></td>
</tr>
</tbody>
</table>

(Source: Zeithaml and Bitner, 2003)
Physical evidence and servicescape are important in Highway management services. This is due to the fact that the road users not only use the highways but they also use the facilities provided along the highways. Thus customers usually find other elements that can be seen or experience (physical environment) that influences their perception of service quality in the highway management services. These elements somehow or rather have connection with the service delivered to them. The dimensions of the technical construct is summarised as at table 2.5 below.

**Table 2.5 : Dimensions of Technical Construct**

<table>
<thead>
<tr>
<th>Technical construct</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanliness</td>
<td>Pavement area</td>
</tr>
<tr>
<td></td>
<td>Rest/wash rooms</td>
</tr>
<tr>
<td></td>
<td>Surau (Muslim praying room)</td>
</tr>
<tr>
<td></td>
<td>Parking area</td>
</tr>
<tr>
<td></td>
<td>External Building area</td>
</tr>
<tr>
<td></td>
<td>Food court</td>
</tr>
<tr>
<td></td>
<td>Common areas</td>
</tr>
<tr>
<td>Pavement</td>
<td>Surface condition</td>
</tr>
<tr>
<td></td>
<td>Road line condition</td>
</tr>
<tr>
<td></td>
<td>Safety of the road</td>
</tr>
<tr>
<td>Road Furniture</td>
<td>Guardrail condition</td>
</tr>
<tr>
<td></td>
<td>Signage is properly maintained</td>
</tr>
<tr>
<td></td>
<td>Signage is informative</td>
</tr>
<tr>
<td>Traffic management</td>
<td>Traffic information</td>
</tr>
<tr>
<td></td>
<td>Traffic diversion/dispersal scheme</td>
</tr>
<tr>
<td></td>
<td>Signage</td>
</tr>
<tr>
<td></td>
<td>Traffic equipments</td>
</tr>
<tr>
<td>Building and facilities</td>
<td>Maintenance of the building and facilities (incl painting, tiles and etc..) at</td>
</tr>
<tr>
<td></td>
<td>(a) RSA (b) OBR (a) lay-by</td>
</tr>
<tr>
<td></td>
<td>Landscaping maintenance</td>
</tr>
</tbody>
</table>
Service quality research in Highway services is very limited. Some application of the SERVQUAL model have been made to measure service quality in various areas such as hospitals (Babakus and Glynn, 1992), property (Seiler, 2004 and Zarita, A.B., 2006), hotels (Saleh and Ryan, 1991), Railway service (K, Y Low and C.K. Lim, 1998) and Commercial banks (Tahir and Bakar, 2007) and Lim (1992).

In view of the limitation, this study is also to look various studies in other areas that have the similarity to the proposed model. This study is developing a conceptual service quality framework for the highway service provider. This study adopted most of the dimensions related to the overall highway services namely Cleanliness, Traffic management, Road furniture, Building and facilities and pavement. Figure 2.4 illustrates the modification and expansion framework of the SERVQUAL (Parasuraman et al, 1988) and PROPERTYQUAL (Zarita, 2006) for the purpose of this research.
CHAPTER THREE
METHODOLOGY

3.0 Introduction

This study was designed to use a service quality instrument or HIWAYQUAL to investigate highway user’s perceptions of service quality in highway management services. This will undertaken by determining if gaps existed in highway users expectations against perceptions of their actual experiences with services delivered by the highway service provider.

This study is exploratory in nature. There is no evidence that a similar research has been done in this area of highway service management. Sekaran (2000) suggested that an exploratory study undertaken when not much is known about the situation at hand or when no information is available ob how similar problems or research issues have been solved in the past. Exploratory research is also consistent with Parasuraman et al (1988) on their first inquiry on service quality. Sekaran (2000) reported that exploratory studies are undertaken to better comprehend the nature of the problem and where limited study has been conducted in the area.

The purpose of this chapter is to discuss how the research was designed and implemented. The discussion includes the research design, sampling procedure and sample size, questionnaire design and data analysis technique.
Figure 3.1 below illustrates the relationship between the main objectives of this research with the research questions and the instruments adopted in this study.

<table>
<thead>
<tr>
<th>RESEARCH OBJECTIVE</th>
<th>RESEARCH QUESTIONS</th>
<th>INSTRUMENT</th>
<th>SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>To measure customer’s perception of service quality in the highway management or service provider</td>
<td>What are the sizes of the gaps of expectation and perceptions toward highway service management in PLUS? What are the customer’s satisfaction level and the level of importance towards the service provide?</td>
<td>Quantitative: Questionnaire survey</td>
<td>PLUS Highway user at Northern area</td>
</tr>
</tbody>
</table>

Figure 3.1: Relationship between Research Objective, Research Questions, Instrument and Sample

3.1 Research design

This study utilises the quantitative research which concerned with the collection and analysis of data in numeric form. According to Punch (1998), quantitative approach conceptualises reality in terms of variables and the relationships between them. Furthermore, it rests on measurement, and therefore pre-structures the data, and usually research questions, conceptual frameworks and design as well. Samples in quantitative studies are typically larger than in qualitative studies and generalization through sampling is usually important. Punch (1998) further argued that, “Quantitative does not see context as central, typically stripping data from their context and it has well developed and codified methods for data analysis. Thus, its
methods are more uni-dimensional and less variable than qualitative methods, and easily replicable”.

This study uses highway users at PLUS Expressway as the unit analysis. Sekaran (2000) defines unit analysis as the level of aggregation of the data collected during the subsequent data analysis stage. In principle, it can be seen that highway users are the main factor that is subject to analysis and the highway is the object to provide the services. The study has been carried out at Northern Region due to the existing/current lane widening work is being carried out at both Central Region and Southern Region.

3.2 Measurement of Construct

Gap generally can be defined as an opening, space between objects or points, an interruption of continuity, a conspicuous different, or imbalance; a disparity or problematic situation resulting from such disparity. Oxford-Fajar Advance learner's Dictionary defined gap as an opening or break between two things, deficiency which needs to be filled. From the marketing perspective, gaps can represent strategic opportunities between the organization’s desired position and its actual position in such areas as corporate image, market segments, or product sales, the difference between attitudes toward one product and another from one person to another or from expectations to performance (Parasuraman et al, 1988).
Since satisfaction is basically a psychological state, care should be taken in the effort on quantitative measurement. Work done by Parasuraman, Zeithaml and Berry between 1985 and 1988 provide the basis for the measurement of customer satisfaction with a service by using the gap between the customer’s expectation of performance and their perceived experience of performance and known as SERVQUAL model. SERVQUAL method takes into account the perceptions of customers of the relative importance of service attitudes. This allows an organization to prioritize and to use its resources to improve the most critical service attributes.

The ultimate goal of service quality measurement is to assist managers in ensuring service quality and customer satisfaction (Webster, 1988). Measurement is a necessary step towards devising any action plan. Defining and measuring quality in services might be difficult due to the intangible nature of the service offering. Many of the researches on service quality have been carried out within this framework of widely accepted service quality model (SERVQUAL instrument) developed by extensive research.

3.2.1 The gap analysis model

The ultimate goal of service quality measurement is to assist managers in ensuring service quality and customer satisfaction (Webster, 1988). Measurement is a necessary step towards devising any action plan. Defining and measuring quality in services might be difficult due to the intangible nature of the service offering.
As can be seen, models for measuring service quality is either viewed as a measure of the degree of discrepancy between consumers’ perceptions and expectations (e.g. Parasuraman et al., 1985) or a tool for assessing the perceived quality (Teas, 1993). Yet, further alternative models have been offered by other authors (Cronin and Taylor, 1992; Bolton and Drew, 1991). A literature review those models can be found in Cauchick Miguel and Salomi (2004) from which the Table 3.1 summarises their main characteristics. Satisfaction and service quality are often treated together as functions of customer’s perception and expectation. The simplest mode is the two-concept equations defined as \( Q = P - E \). There are exceptions in this model. A zone of indifference exists among some customers who have not formed an expectation or do not care about a service. But for most of the part, when perceptions (P) are equal to Expectation (E), service quality (Q) is satisfactory. If expectations are higher than actual perception, a customer’s rating becomes negative (Cottle, 1990).

<table>
<thead>
<tr>
<th>Author</th>
<th>Model</th>
<th>Main Characteristics</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grönroos (1984)</td>
<td>There is no mathematical representation</td>
<td>Quality is a function of expectations, outcome and image</td>
<td>Different types of services</td>
</tr>
</tbody>
</table>
| Parasuraman et al. (1985, 1988) | \(SERVQUAL\)  
\(Q_i = P_i - E_i\) | 22-item scale using 5 quality dimensions | Different types of services |
| Brown and Swartz (1989) | \(Q_i = E_i - D_i\) | Use 10 quality dimensions defined by Parasuraman et al. (1985) | Medical surgery |
| Bolton and Drew (1991)  | Assessment model of service and value. There are many equations representing the model | Use four dimensions developed by Parasuraman et al (1988) and introduce the concept of value for quality assessment | Telephone services |
| Cronin and Taylor (1992)| \(SERVPERF\)  
\(Q_i = P_i\) | Use 5 quality dimensions defined by Parasuraman et al. (1988) | Different types of services |

Table 3.1: Proposed models for measuring service quality (adapted from Cauchick Miguel and Salomi, 2004).
When examining the literature, it becomes clear that there is no consensus on which model is more appropriate in a general sense. SERVQUAL heightened the interest of many researchers but there are some arguments against its validity. Criticisms include the use of different scores, applicability, dimensionality, lack of validity, etc. Critical reviews of SERVQUAL are offered by Asubonteng et al. (1996) and Buttle (1996).

Despite those criticisms, a large number of applications of SERVQUAL have become available. In addition to the applications listed in Table above, different types of services have been investigated using SERVQUAL. Examples of service are fast-food, airlines and long distance telephone calls (Gupta and Chen, 1995), banking (Newman, 2001; Cui et al., 2003), physiotherapy (Curry and Sinclair, 2002), web sites (Iwaarden et al., 2003), health care (Wong, 2002; Kilbourne et al., 2004) hospitals (Babakus and Glynn, 1992), hotels (Saleh and Ryan, 1991), Railway service (K, Y Low and C.K. Lim, 1998) and Commercial banks (Tahir and Bakar, 2007), Lim (1992), to name but a few. The investigations on SERVPERF applications have also been intense but not as much as SERVQUAL. Nevertheless, instances of service types include public services (Bigné et al., 2003), hotels (Nadiri and Hussain, 2005). Kang and James (2004) presented the application of Grönroos’ model (Grönroos, 1984) to explore the European perspective of measuring quality of cell phone services considering other dimensions (technical) besides the functional ones. Application of the SERVQUAL model have been made to measure service quality in Many of the researches on service quality have been carried out within this framework of widely accepted service quality model (SERVQUAL instrument) developed by extensive research.
SERVQUAL was modified in the present study to reflect the nature of highway management services. Parasuraman et al (1988), indicated that such modifications were appropriate and do not represent difficulties related to the reliability and validity of the instruments. The revision includes the adding of new dimensions to reflect the highway management services. The new dimensions of the highway management services include cleanliness, pavement conditions, road furniture, traffic management and building maintenance.

### 3.2.2 Gaps analysis model to measure expectation and perception of highway users

It is obviously shows that the gap analysis has been used in various instances. This research also attempts to use the approach by asking highway users about their expectations and perceptions of their experiences. The study’s gap analysis has built on the SERVQUAL’s technique of asking the users to responds according to what they believe on their perceptions and expectation towards services provided by the highway users. Parasuraman et al (1985) suggested that ‘regardless of the type of service, customers used basically similar criteria in evaluating service quality’.

The instrument used in this study was a modification of SERVQUAL (Parasuraman et al, 1985, 1988), which has a 48 items self completed questionnaire that measured customer expectations and perceptions of service quality. The instrument that has been developed is named HIWAYQUAL. HIWAYQUAL measures expectations and perceptions of service quality along five dimensions of service quality determinants (Parasuraman et al, 1988) and other five dimensions which has been developed in previous Chapter 2 (Conceptual Fraework) and summarised as table 3.2 below.
<table>
<thead>
<tr>
<th>Name</th>
<th>SERVQUAL</th>
<th>HIWAYQUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct</td>
<td>Functional</td>
<td>Functional</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Technical</td>
</tr>
<tr>
<td></td>
<td>Assurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tangibles</td>
<td>Reliability</td>
</tr>
<tr>
<td></td>
<td>Empathy</td>
<td>Assurance</td>
</tr>
<tr>
<td></td>
<td>Responsiveness</td>
<td>Tangibles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Empathy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Responsiveness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cleanliness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pavement condition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Road Furniture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building facilities</td>
</tr>
<tr>
<td>Items</td>
<td>22</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 3.2: Summary of SERVQUAL and HIWAYQUAL

3.3 Sampling Techniques

The focus of this study is the highway users that utilised the facilities provided by the highway concessionaire. Quota convenient sampling technique is used in this research where it makes an explicit provision for representative according to race by assuming that they have an equal chance of being selected for the sample. During this survey, the population is proportionately divided into races based on the current majority of races live in Malaysian as Table 3.1 below:
<table>
<thead>
<tr>
<th>Race</th>
<th>% Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malay</td>
<td>60 – 70 %</td>
</tr>
<tr>
<td>Chinese</td>
<td>20 – 30%</td>
</tr>
<tr>
<td>Indian and Others</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>Total</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Table 3.3: Percentage of Sample Size by Races

The traffic volume frequently travelled along the North South Expressways (NSE) is recorded about 368 millions of cars in year 2007 (PLUS Annual Report, 2007) and average daily of 1.0 million cars.

Currently, PLUS Expressway is divided into 3 Regions for their administration purposes.

- Northern Region – Ipoh Utara/Jelapang until Bukit Kayu Hitam
- Central Region- Ipoh Selatan until Seremban
- Southern Region – Seremban until Johore Baharu

This study is focus on Northern Region area that covers from Jelapang (Ipoh Utara) until Bukit Hitam due to the current lane widening works at the Central and Southern Region. With the disturbance and interruptions of traffic flow at these two Regions, it will influence the findings for this study.
The survey has been carried out at all the Rest and Service Area (RSA) of the Northern Region as these areas are the most convenient place for the road users to stop-by and relax. The Rest and Service Area are located as follows:

a. Grurun RSA North and South Bound  
b. Mini Juru RSA North bound  
c. Bukit Gantang RSA North and South Bound  
d. Sungai Perak RSA North and South Bound

These locations and maps can be viewed PLUS official website (http://www.plus.com.my). The respondent would be selected accordingly and questionnaires would be distributed to them in situ. The data will be collected after the respondents had completed the questionnaires.

3.4 Questionnaire Design

The questionnaire was designed based on the objective of the study (Refer to Appendix 1). Two languages are used in this questionnaire: Bahasa Malaysia and English. The questionnaires were divided into 3 Sections. The First Section was designed to measure the respondent’s expectation (E) regarding service quality and respondents’ perceptions (P) of service quality actually provided by the highway service provider. A five-point Likert Scale ranging from 1 (low) to 5 (high) was used to measure the attributes under five dimensions of functional construct and five dimensions of the technical construct.
Section two of the questionnaire asked the respondent to choose the importance level each of the main services provided by the highway service provider. Meanwhile Section three of the instrument contained questions concerning demographic information. All respondents completed identical questionnaires.

One set of questionnaire was used in this study to measure the customer’s expectation and perceptions of service quality of Highway management services in PLUS highway. The instrument did not require participants to write their names on the survey instruments, respondents felt reassured that their comments were kept confidential.

3.5 Data Analysis Techniques

The instrument used for data collection was a questionnaire. The methodology used to address the research questions are a descriptive research design and statistically analysis. Descriptive research involves the collection of data to answer questions concerning the current status of a given subject and it also involves the formation of hypothesis and collection of data to test that hypothesis.

The researcher analysed the data from the study using descriptive and inferential statistical procedures from Statistical Package for Social Science (SPSS). A reoccurring issue in data analysis of Likert or semantic differential response scales is the appropriateness of certain statistical techniques. DeVellis (1991), pointed out that data collected by Likert types scale might be considered ordinal by some researchers, yet he also stated that a wealth of accumulated experience and prevailing viewpoints supported applying interval-based analytical methods to Likert-sales (Brown and
Swartz, 1989; Parasumanan et al. 1988). However according to DeVellis (2003), a majority of behavioural researchers subscribes to Nunnally’s, (1978), suggestion that its permissible to treat most of the measurement methods in psychology and other behavioural sciences as leading to interval scales.

Cronbach’s alpha was used to investigate the internal consistency reliability. Reliability analysis with Conbach’s alpha was computed for the variables measuring the same dimension to provide evidence of reliability. Above 0.70 was generally considered acceptable (Nunnally, 1978). Reliability analysis was utilised for expectations and perceptions of service quality of the highway users. Descriptive analysis is also used in this study. This analysis is used to describe the gaps using means and standard deviations for each dimension of expectation and perception and for each service quality questions. Descriptive statistics were appropriate statistical analysis because it involves techniques from describing data. The mean measures central tendency of all the respondents for the sample of the population. Standard deviations were used as a measure for variability to indicate how far all of the scores deviated or varies.

Additionally, Pearson’s correlation coefficient and multiple linear regressions are used to analyse the research study. Pearson’s coefficient is used to measure the strength of any linear association between variables. In addition, regression is used to test the effects of an independent (predictor) variable on a single dependent (criterion) variable. The linear regression is used to determine the significant dimensions that influence the perception (satisfaction) of service quality in the highway management services.
CHAPTER FOUR
RESEARCH RESULTS

4.0 Introduction

This chapter is to present research findings, which objectively to test the gap of expectations and perceptions of highway users to the highway services provided by the highway concessionaires (i.e. PLUS Expressway Berhad). This chapter reports the results of the statistical techniques applied in analysing the research results surveys distributed to the highway users in PLUS highway.

4.1 Research Profile

A total of 300 questionnaires were distributed at the respective areas and returned by the respondents and therefore become a sample in this study. However after scanning and screening done towards the instrument data, some missing values has been identified and deleted manually from the analysis. Only 264 questionnaires were valid and accepted. This is to ensure the consistency of the data for the research analysis.

The parametric test were carried out as the sample size was relatively large (n>30) and hence the data was deemed to be normally distributed. This was in accordance to the Central Limit Theorem i.e. for sufficiently large samples (n>30), the sample means will be distributed around the population mean approximately in a normal distribution (Cooper and Schindler, 2001).
4.1.1 Gender

Table 4.1 below shows the total of 264 users who were willing to contribute for the study purpose by gender. Among these 264 respondents, 166 respondents (62.9%) are male and 98 (37.1%) are female. It may be assumed that most of the road users at the highways are male as majority of them use highway for working purposes. While most female travellers are assumed commute the highway for leisure purposes and accompanying husbands or with family to visit parents and relatives.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>166</td>
<td>62.9</td>
<td>62.9</td>
<td>62.9</td>
</tr>
<tr>
<td>female</td>
<td>98</td>
<td>37.1</td>
<td>37.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.1 : Distribution of Respondents by Gender

4.1.2 Age

Table 4.2 Shows the distribution of users by age class category, where most of the respondents are from age class 35 – 44 years old (41.3%). The second highest age class is 45 – 54 years old (22.7%), and the lowest age class is above 55 years old (3.0%). According to the results below, it may assume that the majority of the highway users are in the middle age category (35 – 44 years old).
Table 4.2: Distribution of Respondents by Age Class

<table>
<thead>
<tr>
<th>Age Class</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>39</td>
<td>14.8</td>
<td>14.8</td>
<td>14.8</td>
</tr>
<tr>
<td>25-34</td>
<td>48</td>
<td>18.2</td>
<td>18.2</td>
<td>33.0</td>
</tr>
<tr>
<td>35-44</td>
<td>109</td>
<td>41.3</td>
<td>41.3</td>
<td>74.2</td>
</tr>
<tr>
<td>45-54</td>
<td>60</td>
<td>22.7</td>
<td>22.7</td>
<td>97.0</td>
</tr>
<tr>
<td>55 and above</td>
<td>8</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: Distribution of Respondents by Age Class

4.1.3 Marital Status

Table 4.3 shows the distribution of users in PLUS highway by marital status. Most of the users of which 75.8% are married and the rest 23.9% are single. It may be assumed that the users who are married were using the highway for working purposes or they use the highways to visit family and relatives.

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>200</td>
<td>75.8</td>
<td>75.8</td>
<td>75.8</td>
</tr>
<tr>
<td>Single</td>
<td>63</td>
<td>23.9</td>
<td>23.9</td>
<td>99.6</td>
</tr>
<tr>
<td>single parent</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3: Distribution of Respondents by Marital Status

4.1.4 Education Level

The table 4.4 indicates that most of the respondents by education level are graduates (39.8%), followed by Secondary leavers (23.1%) and subsequently, with certificate background or college (23.1%). From this data, it is assumed that the opinion of the
survey is well distribute based on their education level. It is essential to obtain views and responses from various background and education level towards the service quality provided by the highway service provider.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary</td>
<td>81</td>
<td>30.7</td>
<td>30.7</td>
<td>30.7</td>
</tr>
<tr>
<td>college</td>
<td>61</td>
<td>23.1</td>
<td>23.1</td>
<td>53.8</td>
</tr>
<tr>
<td>graduate</td>
<td>105</td>
<td>39.8</td>
<td>39.8</td>
<td>93.6</td>
</tr>
<tr>
<td>post graduate</td>
<td>17</td>
<td>6.4</td>
<td>6.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.4 : Distribution of Respondents by Education Level

4.1.5 Job Status

Table 4.5 below demonstrates the working profile of the respondents. Most of the respondents are non managerial category (45.8%) followed by middle management (43.9%) and the least is in senior management position (10.2%). It is tandem with the distribution of respondents by education level which cumulatively the college and secondary level response the most.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-managerial</td>
<td>121</td>
<td>45.8</td>
<td>45.8</td>
<td>45.8</td>
</tr>
<tr>
<td>Middle Mgmt</td>
<td>116</td>
<td>43.9</td>
<td>43.9</td>
<td>89.8</td>
</tr>
<tr>
<td>Senior mgmt</td>
<td>27</td>
<td>10.2</td>
<td>10.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5 : Distribution of Respondents by Job Status
### 4.1.6 Income Level

Table 4.6 shows the distribution of respondents by income level. The highest income level is RM1001 – RM3000 (48.1%), and this is followed by income level of RM3001 – RM5000 (27.7%), while the lowest respondent is from income level RM8000 and above. It is assumed that income level RM5000 and below are the frequent users of the highways as there are energetic, young and frontline managers of the company.

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1000</td>
<td>50</td>
<td>18.9</td>
<td>18.9</td>
<td>18.9</td>
</tr>
<tr>
<td>1001-3000</td>
<td>127</td>
<td>48.1</td>
<td>48.1</td>
<td>67.0</td>
</tr>
<tr>
<td>3001-5000</td>
<td>73</td>
<td>27.7</td>
<td>27.7</td>
<td>94.7</td>
</tr>
<tr>
<td>5001-8000</td>
<td>12</td>
<td>4.5</td>
<td>4.5</td>
<td>99.2</td>
</tr>
<tr>
<td>8001-10,000</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>99.6</td>
</tr>
<tr>
<td>10,001</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4.6 : Distribution of Respondents by Income level**

### 4.1.7 Race and Religion

The Table 4.7 shows that 200 respondents are Malays (75.8%) and 64 respondents (24.2%) are others or non Malay with various religious background. However, it is slightly achieved below target of this research quota where it intends to obtain 60 -70% for Malay respondents and 30 – 40 % non Malays.

<table>
<thead>
<tr>
<th>Race</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malay</td>
<td>200</td>
<td>75.8</td>
<td>75.8</td>
<td>75.8</td>
</tr>
<tr>
<td>Chinese</td>
<td>38</td>
<td>14.4</td>
<td>14.4</td>
<td>90.2</td>
</tr>
<tr>
<td>Indian</td>
<td>23</td>
<td>8.7</td>
<td>8.7</td>
<td>98.9</td>
</tr>
<tr>
<td>Sikh</td>
<td>2</td>
<td>.8</td>
<td>.8</td>
<td>99.6</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.4</td>
<td>.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4.7 : Distribution of Respondents by Race**
The Table 4.8 shows that 200 respondents are Muslims (75.8%) and 64 respondents (24.2%) are non muslims or other religious backgrounds.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>islam/muslim</td>
<td>200</td>
<td>75.8</td>
<td>75.8</td>
<td>75.8</td>
</tr>
<tr>
<td>christian</td>
<td>20</td>
<td>7.6</td>
<td>7.6</td>
<td>83.3</td>
</tr>
<tr>
<td>hindu</td>
<td>22</td>
<td>8.3</td>
<td>8.3</td>
<td>91.7</td>
</tr>
<tr>
<td>buddha</td>
<td>19</td>
<td>7.2</td>
<td>7.2</td>
<td>98.9</td>
</tr>
<tr>
<td>other</td>
<td>3</td>
<td>1.1</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.8 : Distribution of Respondents by Religion

4.2 Reliability Assessment

Reliability in this research refers to its ability to cope and manage the same value when measurement is replicated in another situation. According to Bruner and Hansel, 1994 ‘Alpha-Cronbach’ is a standard method for measuring reliability of the study.

The internal consistency of the instrument was assessed through 10 dimensions of Functional and Technical constructs. The five dimensions: tangibles, responsiveness, empathy, reliability and assurance were used as indicators of the functional construct. Other dimensions: cleanliness, pavement condition, road furniture, traffic management and building maintenance were used as indicators of Technical constructs. Both expectations and perception scores for each dimension were assessed using Cronbach’s Alpha. The results are summarised in Table 4.9 as below:
Table 4.9 : Reliability coefficients for ten dimensions

4.3 Overall test

The test of consistency for overall items gives the high value of Alpha Cronbach i.e. 0.952 as shown in Table 4.10. Therefore, it can be concluded that this instrument is reliable and applicable to be used. This is based from Nunnally’s (1959) study that Cronbach’s Alpha above 0.70 was generally considered acceptable. Furthermore, Chua (2006) mentioned that when Cronbach Coefficient Alpha produced the value 0.60 to 0.95 it shows that the level of the instrument is good and suitable to be used. While Cronbach Alpha too low at the value below 0.60, it shows that the instrument is having low reliability and the instrument should be improved. When Alpha Coefficient is too high i.e. 0.96 and above, it shows that most of the items are similar or redundant among themselves and the redundant items in the instrument is not
required. Consequently, this study shows high level of instrument reliability and it is suitable to apply in this study.

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardised items</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>.952</td>
<td>.956</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 4.10 : Reliability statistics for overall items

4.4 Gap analysis

As we acknowledged earlier in the previous chapter, one of the objective of this study is to identify the sizes of the gaps towards highway management services in Malaysia. The gap score is obtained by subtracting expectations from perceptions (G= P-E). Thus gap score greater than one is large, which suggest there is a tremendous difference between the perception and expectation scores (Harris, 2002). The gaps were investigated for the highway users as shown in Table 4.11.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Dimensions</th>
<th>Perception</th>
<th>Expectations</th>
<th>Gap score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional</td>
<td>Reliability</td>
<td>3.43</td>
<td>4.28</td>
<td>-0.85</td>
</tr>
<tr>
<td></td>
<td>Responsiveness</td>
<td>3.55</td>
<td>4.41</td>
<td>-0.86</td>
</tr>
<tr>
<td></td>
<td>Assurance</td>
<td>3.61</td>
<td>4.38</td>
<td>-0.77</td>
</tr>
<tr>
<td></td>
<td>Empathy</td>
<td>3.46</td>
<td>4.28</td>
<td>-0.82</td>
</tr>
<tr>
<td></td>
<td>Tangibles</td>
<td>3.60</td>
<td>4.35</td>
<td>-0.75</td>
</tr>
<tr>
<td>Technical</td>
<td>Cleanliness</td>
<td>3.76</td>
<td>4.52</td>
<td>-0.76</td>
</tr>
<tr>
<td></td>
<td>Pavement condition</td>
<td>3.48</td>
<td>4.42</td>
<td>-0.94</td>
</tr>
<tr>
<td></td>
<td>Road furniture</td>
<td>3.68</td>
<td>4.42</td>
<td>-0.74</td>
</tr>
<tr>
<td></td>
<td>Traffic mgmt</td>
<td>3.53</td>
<td>4.35</td>
<td>-0.82</td>
</tr>
<tr>
<td></td>
<td>Building &amp; fac</td>
<td>3.66</td>
<td>4.42</td>
<td>-0.76</td>
</tr>
</tbody>
</table>

Note: M = Mean : SD = Standard Deviation

Tables 4.11 : Descriptive statistics of highway user’s expectation and perception towards Highway Management Services
All the gaps scores were less than one, which suggested that the respondents perceived quality of the service were less than expectation. The greatest disparity among the dimensions between expectation and perception means was Pavement condition (-0.94) and followed by Responsiveness (-0.86).

Referring to the table above, it shows that the value of the gap scores is negative in all dimensions. The lowest gap (G = -0.74) was Road Furniture (Technical Construct) while the highest gap (G = -0.94) was Pavement Condition (Technical Construct).

4.5 Satisfaction level

Perception is the experience that the customers (highway users) have gone through with the service provider. Customers (highway users) perceived services in terms of the quality of the service and how satisfied they are overall with their experience. Thus perceptions are always considered relative to expectations. Since expectations are dynamic, evaluation may shift over time, from person to person and from culture to culture. In addition, what is considered quality service or the things that satisfy customer today may be different in the future.

Zeithaml and Bitner (2003), reported that satisfaction is generally viewed as a broader concept, whereas service quality assessment focuses specifically on dimensions of service. Based on this view, perceived service quality is a component of customer’s satisfaction. In addition, Rust et al (1996) have pointed out in two different situations for customer’s satisfaction. As illustrated in the literature review, if the perceived
quality is higher than expected, this situation will usually result in satisfaction. Oppositely, if perceived quality is not as good as expected, in this situation will result in dissatisfaction.

Based on the above illustration by Rust et al (1996) we can observed from the Table 4.12, that almost all of the gaps are negative. Most of the respondents perceived service provided by the service provider is less than expected. The lowest gap (G = -0.74) was Road Furniture (Technical Construct) while the highest gap (G = -0.94) was Pavement Condition (Technical Construct).

From the above observations, this shows that highway users is not satisfied with all the dimensions measured and pavement condition rank the highest, responsiveness follows the next rank while Road furniture rank the lowest.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAVEMENT</td>
<td>264</td>
<td>-0.9407</td>
<td>.99569</td>
</tr>
<tr>
<td>RESPONSIVENESS</td>
<td>264</td>
<td>-0.8649</td>
<td>.89868</td>
</tr>
<tr>
<td>RELIABILITY</td>
<td>264</td>
<td>-0.8500</td>
<td>.80639</td>
</tr>
<tr>
<td>EMPATHY</td>
<td>264</td>
<td>-0.8210</td>
<td>.97396</td>
</tr>
<tr>
<td>TRAFFIC</td>
<td>264</td>
<td>-0.8194</td>
<td>.95914</td>
</tr>
<tr>
<td>ASSURANCE</td>
<td>264</td>
<td>-0.7699</td>
<td>1.07483</td>
</tr>
<tr>
<td>BUILDING</td>
<td>264</td>
<td>-0.7642</td>
<td>.78750</td>
</tr>
<tr>
<td>CLEANLINESS</td>
<td>264</td>
<td>-0.7614</td>
<td>.77432</td>
</tr>
<tr>
<td>TANGIBLES</td>
<td>264</td>
<td>-0.7538</td>
<td>.79761</td>
</tr>
<tr>
<td>ROADFURN</td>
<td>264</td>
<td>-0.7424</td>
<td>.88123</td>
</tr>
</tbody>
</table>

Table 4.12 : Respondent Gaps Score

The tables above shows that the customers are not satisfied with the current condition of the pavements.
4.6 Level of Importance

The respondents were also inquired to state their opinion on the importance of the dimensions of the SERVQUAL. Descriptive analysis is used to conduct the study and compare the opinions. Table 4.13 shows that the pavement condition ranks the most important among the dimensions. Compare to the gaps score, the pavement condition also rank the most important dimensions among the respondents.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Mean</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement Condition</td>
<td>2.33</td>
<td>1</td>
</tr>
<tr>
<td>PlusRonda Service</td>
<td>2.29</td>
<td>2</td>
</tr>
<tr>
<td>Road Furniture</td>
<td>2.29</td>
<td>3</td>
</tr>
<tr>
<td>Traffic Management</td>
<td>2.24</td>
<td>4</td>
</tr>
<tr>
<td>Facility Maintenance</td>
<td>2.19</td>
<td>5</td>
</tr>
<tr>
<td>Cleanliness</td>
<td>2.05</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4.13: Ranking of Importance of service dimension as perceived by Highway user

4.7 Determining the Significant Dimensions that influence Highway Service Quality Perception.

In order to determine the significant factors that influence highway service quality perception, the researcher first conducted Pearson’s correlation coefficient. Pearson’s Correlation Coefficient is usually signified by \( r (\rho) \), and can take on the values from -1.0 to 1.0. Where -1.0 is a perfect negative (inverse) correlation, 0.0 is no correlation, and 1.0 is perfect positive correlation. In interpreting correlation coefficients in linear
relationships, correlation coefficients of 0.30, 0.40, 0.70, irrespective of the sign, are typically interpreted as weak, moderate and strong respectively (Harris, 2002). Table 4.14 illustrates the interpretation of correlation coefficients. Seldom, a correlation be zero or perfectly be zero or perfect, usually, the covariation between variables will be something like 0.43 or -0.16 (Rummel, 1996).

Table 4.14 : Summary of Correlation Coefficient Interpretation

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong negative relationship</td>
<td>-1.00 to -0.70</td>
</tr>
<tr>
<td>Moderate negative relationship</td>
<td>-0.69 to -0.40</td>
</tr>
<tr>
<td>Weak relationship</td>
<td>-0.39 to -0.39</td>
</tr>
<tr>
<td>Moderate positive relationship</td>
<td>0.40 to 0.69</td>
</tr>
<tr>
<td>Strong positive relationship</td>
<td>0.70 to 1.00</td>
</tr>
</tbody>
</table>

(Source : Harris, 2002)

Based on the coefficients (Table 4.15), it shows that the customers overall service quality perception is significantly correlated at p<0.01 but moderately positive relationship with their perceptions of the 10 dimensions. Therefore, Multiple Linear Regression was carried out to investigate the relationship.
From the above analysis it is observed that service quality perception has positively relationship with the dimensions while the service quality expectation has negatively relationship with the ten dimensions of the instrument. A regression equation is important in expressing the relationship between two (or more) variables algebraically. It indicates the nature of the relationship between two (or more)
variables. In particular, it indicates the extent to which the researcher can predict some variables by knowing others, or the extent to which some are associated with others ie Highway user’s overall service quality perception and the ten dimensions of the instrument.

A second measure of relationship was the use of multiple linear regression analysis, stepwise approach. Table 4.16 shows the results of multiple linear regression analysis.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.879</td>
<td>.035</td>
<td>110.089</td>
</tr>
<tr>
<td></td>
<td>RELIABILITY</td>
<td>.076</td>
<td>.056</td>
<td>1.361</td>
</tr>
<tr>
<td></td>
<td>RESPONSIVENESS</td>
<td>-.015</td>
<td>.044</td>
<td>-.340</td>
</tr>
<tr>
<td></td>
<td>ASSURANCE</td>
<td>.048</td>
<td>.029</td>
<td>1.648</td>
</tr>
<tr>
<td></td>
<td>EMPATHY</td>
<td>.047</td>
<td>.038</td>
<td>1.220</td>
</tr>
<tr>
<td></td>
<td>TANGIBLES</td>
<td>-.039</td>
<td>.050</td>
<td>-.778</td>
</tr>
<tr>
<td></td>
<td>CLEANLINESS</td>
<td>.103</td>
<td>.045</td>
<td>2.265</td>
</tr>
<tr>
<td></td>
<td>PAVEMENT</td>
<td>.082</td>
<td>.038</td>
<td>2.153</td>
</tr>
<tr>
<td></td>
<td>ROADFURN</td>
<td>.077</td>
<td>.049</td>
<td>1.574</td>
</tr>
<tr>
<td></td>
<td>TRAFFIC</td>
<td>.046</td>
<td>.039</td>
<td>1.177</td>
</tr>
<tr>
<td></td>
<td>BUILDING</td>
<td>-.057</td>
<td>.053</td>
<td>-1.086</td>
</tr>
</tbody>
</table>

a Dependent Variable: Perception

It was found that the significant factors that influence highway user’s service quality perception were cleanliness and pavement condition (p <0.05). The positive value of regression coefficient indicates that cleanliness and pavement condition have a positive effects on the overall service quality perception. Cleanliness was found to have a greater influence on the service quality perception compared to pavement condition as indicated by the coefficient.
Table 4.17 illustrates the percentage R square which explain the percentage of the variance in overall service quality scores. It also shows that the adjusted R-Square of 0.365 indicates that 36.5 percent of the total variation in service quality perception is explained by their perception on cleanliness and pavement condition.

Table 4.17 : Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.623(a)</td>
<td>.388</td>
<td>.364</td>
<td>.36562</td>
</tr>
</tbody>
</table>

a Predictors: (Constant), BUILDING, ASSURANCE, RESPONSIVENESS, CLEANLINESS, PAVEMENT, EMPATHY, TRAFFIC, TANGIBLES, ROADFURN, RELIABILITY
b Dependent Variable: Perception

Cleanliness in this research focused on the cleanliness of the highway and highway facilities. It includes cleanliness at the highway proper, cleanliness at wash/toilet areas, cleanliness at external and internal of the building areas. Cleanliness is very important factor due to perception of users that the highway are properly kept and maintained accordingly. It also symbolised the image of the company that the highway has been properly managed and under control. Without proper cleanliness in the highway and highway facilities, it will give bad impression to users and especially foreigners that our people are unhygienic and dirty. Thus, this has influence highway users positive effect of cleanliness towards the perception of service quality because cleanliness plays an important role/influence in the daily activities.

In addition, the results also revealed that Malaysian highway users perceived that pavement conditions are also important factors. Pavement conditions include comfort during driving, safety of the road and condition of the road line markings. All these elements contribute towards a better roads and safety of the road. Highway road user
feel safe and comfortable if the condition of the roads are properly rehabilitate, safe and without obstructions. It also means that safety comes first. Therefore, pavement condition/road surface has to have a minimum standard so that highway operators to follow and ensure that to increase the perception of service quality and hence gain satisfaction from them.

4.8 Socio-demographic Analysis

On this situation, the researcher wishes to use t-test and one-way analysis of variance ANOVA and to compare the means of score. ANOVA was applied to test the significant difference for Gap means with respect to Age categories and income range. While the T-test was applied to determine the significant difference of the Gaps means between two groups such as Gender, status of marital and others.

The basic procedure of ANOVA, is to derive two different estimates of population variance from the data, then calculate a statistic from the ratio of these two estimates. One of these estimates (between-groups variance) is a measure of the effect of the independent variable combine with error variance. The other estimates is within-group variance is error variance by itself (Coakes. S.J.,2005).
4.8.1 Gap Score and Age Category

The mean value of Gaps occurs to be varies in age category as shown in Table 4.17. the highest mean for the Gaps Score in age category is from respondent’s age category below 34 years old (-0.8996), this follow by age category 45 and above (-0.7969). The lowest mean value is from user’s age category between 35 – 44 years old (-0.7520). From the data gathered, most of the users are middle age category whereby giving the lowest mean value for the gaps score.

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 34</td>
<td>87</td>
<td>-0.8996</td>
</tr>
<tr>
<td>35-44</td>
<td>109</td>
<td>-0.7520</td>
</tr>
<tr>
<td>45+</td>
<td>68</td>
<td>-0.7969</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>-0.8122</td>
</tr>
</tbody>
</table>

Table 4.18 : Mean Gap Score and Age Category

The results form the Analysis of Variance (ANOVA) in table 4.19 shows that the mean Gap Score are statistically insignificant with respect to different age category at the 0.05 significant levels.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.075</td>
<td>2</td>
<td>.538</td>
<td>1.005</td>
<td>.367</td>
</tr>
<tr>
<td>Within Groups</td>
<td>139.632</td>
<td>261</td>
<td>.535</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>140.707</td>
<td>263</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.19 : ANOVA results by Age Category
4.8.2 Gap Score and Education Level

The mean value of Gap score occurs to be varies in age category as shown in Table 4.20. The highest mean for the Gap Score in Education level is from respondent of Certificate holder (-0.8948), this follow by graduate (-0.7902). The lowest mean value is from Secondary level (-0.7831). From the data gathered, most of the users are Certificate holder whereby giving the lowest mean value for the gap score.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary</td>
<td>81</td>
<td>-0.7831</td>
</tr>
<tr>
<td>Certificate</td>
<td>61</td>
<td>-0.8948</td>
</tr>
<tr>
<td>Graduate</td>
<td>122</td>
<td>-0.7902</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>-0.8122</td>
</tr>
</tbody>
</table>

Table 4.20 : Mean Gap Score and Education Level

The results form the Analysis of Variance (ANOVA) in table 4.21 shows that the mean Gap Score are statistically insignificant with respect to different age category at the 0.05 significant levels.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.544</td>
<td>2</td>
<td>.272</td>
<td>.507</td>
<td>.603</td>
</tr>
<tr>
<td>Within Groups</td>
<td>140.163</td>
<td>261</td>
<td>.537</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>140.707</td>
<td>263</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.21 : ANOVA Results by Education Level
4.8.3 Gap Score and Job Category

The mean Gap Score is found not significant between Job Category. The mean Gap Score for the non-managerial (-0.9051) was higher than the managerial respondents (-0.7336). The T-test results show that the difference is significantly different at the level 0.05. The T-test results was summarised in Table 4.22.

<table>
<thead>
<tr>
<th>Job category</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-managerial</td>
<td>121</td>
<td>-0.9051</td>
<td>.78278</td>
<td>.07116</td>
<td>-1.908</td>
<td>.058</td>
</tr>
<tr>
<td>manageri al</td>
<td>143</td>
<td>-0.7336</td>
<td>.67788</td>
<td>.05669</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.22 : T-test Results by Job Category

4.8.4 Gap Score and Marital Status

The mean Gap score is found significant between Marital Status as shown in Table 4.23. The analysis indicated that the single respondents giving the high gap score (-1.0238) compared to married respondents (-0.7445).

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>200</td>
<td>-0.7445</td>
<td>.74066</td>
<td>.05237</td>
<td>2.690</td>
<td>.008</td>
</tr>
<tr>
<td>Single</td>
<td>64</td>
<td>-1.0238</td>
<td>.66377</td>
<td>.08297</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.23 : T-test Results by Marital Status
4.8.4 Gap Score and Races

The mean Gap score is found not significant between races as shown in Table 4.23. The analysis indicated that the non-Malay respondents giving the high gap score (-0.9327) compared to Malay respondents (-0.7736).

<table>
<thead>
<tr>
<th>Job category</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaps Malay</td>
<td>200</td>
<td>-.7736</td>
<td>.76166</td>
<td>.05386</td>
<td>1.159</td>
<td>.130</td>
</tr>
<tr>
<td>Non-Malay</td>
<td>64</td>
<td>-.9327</td>
<td>.61766</td>
<td>.07721</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.23 : T-test Results by Races

4.8.5 Gaps score and Income Range

The mean Gap score is found not significant between income ranges as shown in Table 4.24. The analysis indicated that the income range of RM3000 and below respondents giving the high gap score (-0.8404) compared to income range of RM3000 and above (-0.7547).

<table>
<thead>
<tr>
<th>Job category</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaps Below RM 3000</td>
<td>177</td>
<td>-.8404</td>
<td>.72270</td>
<td>.05432</td>
<td>-0.894</td>
<td>.372</td>
</tr>
<tr>
<td>Above RM 3000</td>
<td>87</td>
<td>-.7547</td>
<td>.74985</td>
<td>.08039</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.24 : T-test Results by Income Range
CHAPTER FIVE
SUMMARY AND CONCLUSION

5.0 Introduction

This final chapter will discuss on the findings of the study. This exploratory study has developed a new instrument to measure the highway management services and also to investigate the status of service quality and satisfaction in Malaysian highway. Without this proper instrument it is unsure whether service quality gap can be measured and exists. Furthermore it assists us to plan future corrective actions and focus on the customer satisfaction. This section is organised in the order of the two research objectives. Each research objective is first restated and then the conclusions are set forth and discussed.

5.1 Overview of the Study

The intention of this research is to measure the customer’s satisfaction and service quality of the highway management services. Although the objective of the study relates to gap analysis and customer satisfaction, but the limitation of the study on service quality on highway that contributes to the development of this modification of SERVQUAL model to suits the existing industry. For meaningful of the development of this model and future reference, this model can be called as HIWAYQUAL
The process of developing HIWAYQUAL, involved three main stages; firstly the background search to support the instrument (chapter 2 – Literature review), Secondly, the development of the questionnaires (chapter 3 – Methodology) and thirdly, utilising the statistical analysis which are aimed at investigating the reliability of the instrument (Chapter 4 – Data Analysis).

On the first stage, various comparisons and search has been carried out to determine the right construct for the new development of service quality models. As there is no service quality model for highway management services, the search is more towards the similar and closely associated with the concepts. The synthesis suggested that each of the models consists of at least one construct that explained service before (functional) and after (technical) to fit the industry understudy.

The second process involves the identification of the dimension of service quality. A comparison been made between the various authors that develop significant service quality dimensions such as Sasser (1978), Parasuraman et al (1988) and Gronroos (1988). Finally, the author has chosen Parasuraman et al (1988) five dimensions of service quality namely reliability, assurance, tangible, empathy and responsiveness as the most relevant dimensions to measure functional construct.

A highway management service is different from other service where it involves two components, the management and the facilities provided by the operator. The management side mainly focus on the service is being performed. The dimension
under the management is explained under the functional construct or the five dimension mentioned earlier. While the facilities provided are the outcome of the physical product. Based on the management experience and focus, the author has identified five dimensions under technical construct that is cleanliness, pavement condition, traffic management, Road furniture and building and facility maintenance. Upon identification of the conceptual framework, it continues with the development of the questionnaires. The development of the questionnaires has been discussed in chapter 3 Research methodology.

This next stage is to evaluate and carry out reliability test for HIWAYQUAL, service quality instrument for highway management services. This test is to assess the internal consistency of the dimensions used in the HIWAYQUAL. Further to that, this study has used HIWAYQUAL to measure the perceived service quality of the highway service provider. It measures the gaps between the perceptions of users against the expected services provided by the highway service provider. This study has also provided the highway users to rank the relative importance of the service quality dimensions. This study is a starting point for the highway service provider to comprehend the relative degree of satisfaction and dissatisfaction of the highway users. Subsequently, improvement and strategies for the betterment of the highway and current facilities could be made accordingly.
5.2 Summary of Major Findings

The internal reliability of the instruments shows that all dimensions of HIWAYQUAL have adequate and high internal consistency for both expectation and perception dimensions as the reliability coefficients are above 0.952. This is based from Nunnally’s (1959) study that Cronbach’s Alpha above 0.70 was generally considered acceptable. Furthermore, Chua (2006) mentioned that when Cronbach Coefficient Alpha produced the value 0.60 to 0.95 it shows that the level of the instrument is good and suitable to use. While Alpha Cronbach too low at the value below that 0.60, it shows that the instrument is having low reliability and the instrument should be improved. When Alpha Coefficient is too high i.e. 0.96 and above, it shows that most of the items are similar or redundant among themselves and the redundant items in the instrument is not required. Hence, this analysis also shows that HIWAYQUAL is a robust instrument to measure service quality in other highways in Malaysia.

From the Gap analysis at Chapter 4, it is observed that most of the dimensions shows negative gap among the respondent’s opinion. The gap score is obtained by subtracting expectations from perceptions (G = P - E). Thus gap score greater than one is large, which suggest there is a tremendous difference between the perception and expectation scores (Harris, 2002). The lowest gap (G = -0.74) was Road Furniture (Technical Construct) while the highest gap (G = -0.94) was Pavement Condition (Technical Construct). Pavement condition elements include comfort during driving, safety of the road and condition of the road line markings. All these elements give great impact to the road user if not properly maintained and monitored. During this
research study carried out at area, North South Expressways is in progress to widen its road from dual lane to three lanes both bounds. During this process most of the locations are obstructed and few areas with traffic flow are congested. The safety of the area also below par as it is still under construction. Subsequently results the highway users will meet unhappy experience during the journey and influence the judgement of the survey.

However, the highway operator should not take for granted for the above occasions. Safety of the users should be come first. Proper maintenance of the road should also take into accounts. From the current scenario, the Highway Service provider has carried out on the improvement of the facilities and infrastructure especially the road improvement programmes. Bases on PLUS Annual Report (2007) they have spent more than RM 40 millions to improve, upgrade and rehabilitate roads and other facilities that not under the third lane widening projects. This is to ensure the roads are safe and according to standard required by the authorities. The third widening projects also contribute to the improvement of the traffic flow and customer satisfaction in future.

Customer satisfaction measurement serves two roles, providing information and enabling communication with customers. Perhaps the primary reason for taking the time to measure customer satisfaction is to collect information, either regarding the customers say that needs to be done differently or to assess how well an organization is currently meeting its customer needs. A secondary, but no less important function of customer satisfaction measurement in service industries, is that by surveying customers, an organization is demonstrating its interest in communicating with its
customers – finding out their needs, pleasures and displeasures and overall well-being. Though it is impossible to measure the satisfaction of every single customer, those whose opinions are solicited and others, who observe this process, are given a sense of importance and recognition.

As discussed previously on customer satisfaction, Rust et. al. (1996) have clearly illustrated in the relationship between perceived quality and satisfaction. It has pointed out in two different situations. When the perceived quality is higher than expected this situation will usually result in satisfaction. Oppositely, if perceived quality is not as good as expected, it will result in dissatisfaction. This disconfirmation (gaps) forms the conceptual basis for the SERVQUAL model for the service quality and satisfaction.

From the data analysis on chapter 4, pavement condition ranks the highest dissatisfaction among the dimensions in the gaps analysis. This shows that the highway operators need to focus on the pavement condition especially on the safety of the roads ie reduce obstruction, ensure the roads are in good condition and road line markings are maintained accordingly. Safety of the roads also should be taken care especially rehabilitation and improvements of the roads. Proper traffic signage and diversion during the works and early warning for any lane closure can contribute to the safety of the users. The quality of the roads should be reviewed by the Highway operator, where some of the roads are undulating and bumpy at a certain stretch. The minimum standards should be adhered to not for the sake of authority requirements but to ensure the users have a riding comfort when using the highways.
Kotler and Johnson (1999) mentioned that satisfaction is not a universal phenomenon and not everyone gets the same satisfaction out of the service experience. The reasons are that customers have a different needs, objective and past experience that influence the expectations. Therefore aim is not only satisfying their customers but also delight them. In view of the above illustrations, past experience influence the judgement of the services. In this research context, the respondents/highway users have gone through dissatisfying situation along the highway as major stretch of the highways are under constructions. This also influences the judgement of the respondents on the survey. Nevertheless, the highway operators should consider and view this seriously to ensure the condition of the roads are up to the required standards and proper care should be enhance on the safety of the roads.

Based on the respondents/highway user’s opinion, the important factor/dimension rank highest is the pavement condition. This shows a relationship between the satisfaction and important perception of the respondents. Respondents perceived that pavement condition dimension is the critical factor in the highway management services. This finding is true as the main asset for highway operators is the roads. If the condition of the roads is in bad condition and not properly maintained, the user will raise complaints to the authorities and will give bad impression towards the management of the highway. Additionally will tarnished the highway operators image and finally the concessionaires agreements can be terminated.
Hence, the highway operators and authorities are now able to make decision about service improvement and customer’s satisfaction. This also allows the operators and authorities to look in different angle and in different ways. This study initiates for the highway operators and the authorities to comprehend better the relative degree of satisfaction and dissatisfaction of the users. This is a major contribution of this study whereby this information is non-existence before. Improvement and strategic approach can be made accordingly. The Highway operators should consider establishing service standards to improve the customer’s satisfactions. Technical and social skills of the employees should be emphasized and improved. The important of good service performance is imperative to the success of the company, thus each employee should share the responsibility of the service quality.

During this globalization waves and customer focussed markets, customer’s opinions have to be considered. Their suggestions and comments should be addressed accordingly to ensure the service is properly adhered to the benchmark. Thus, maintaining strong and close relationship with the users adds value beyond the basic services provided is critical to achieving long term satisfaction. Customer’s satisfaction has a direct impact on relationship strength (Gronroos, 2000). Firstly is the relationship between customer and a service/product; secondly is the relationship between the customer and the provider of the service/products; and thirdly is the relationship between the provider of the service/product and their service or products. Satisfaction is subjective; therefore, it is not inherent in the individual or the service but is socially constructed response to the relationship between customers, the
service/products and the provider. Thus the provider (service/product) can influence the various dimensions of the relationship as well as customer satisfaction.

Conclusively, this study has contributes to better understanding of service quality and satisfaction in the highway management services in Malaysia. The development of HIWAYQUAL becomes an assessment tool in determining the levels of perception of the service quality towards the highway services. The questionnaires survey has provided an informational tool for determining what the highway operators need to focus and to improve the service quality offered to their users. The study also reveals the importance of delivering quality service in order to satisfy their customers. Additionally this study will add base of knowledge regarding the assessment of service quality and customer satisfaction for highway management services in Malaysia. Another important contribution from this study is to add underdeveloped pedagogy related to defining and measuring service quality and satisfaction in the highway management services.

5.3 Managerial Implications

Customer satisfaction ad service quality has drawn interest of government institutions, regulatory body and business entities. Thus cooperation between the regulatory bodies and the business entities is essential to embed the culture of service quality and satisfied the customer in ensuring the improvement of the service. The findings resulting from this study have meaningful managerial implications for the regulatory bodies as well as the highway operators.
5.3.1 Implications for the Regulatory bodies

Regulations and standards of practice have been established to ensure the maintenance and safety of the road users is regulated. All the requirements and specifications have been outlined in the Maintenance Management Agreements (MMA) during the sign off between the Government and the privatised company. The regulatory body for highway in Malaysia, known as Malaysian Highway authorities (MHA) supposed to carry out customer satisfaction survey for all privatised road in Malaysia every two years. MHA appointed consultants to carry out the survey and unfortunately different consultant for every survey. Thus, there is no standard survey form and each company has their own survey procedures and questionnaires. With the establishment of this HIWAYQUAL, the Regulatory body, MHA can utilise the instrument to evaluate the customer satisfaction of highway users in Malaysia. Furthermore to standardised the format and analysis during the survey. Secondly, the Regulatory body should establish a customer satisfaction Index (CSI) for highway operators. This is to benchmark the customer satisfaction of the highway concessionaire so these companies are regulated with comparative standards in maintaining the highways.

5.3.2 Implications for the Highway Concessionaires/Operators

Highway operators should viewed highway users as valid customers. If customers dissatisfied, this is because their needs have not been met. When customers expressed their dissatisfaction about highway management services, it suggests a systematic failure to communicate and properly set expectations with the customers. Kotler,
(2005), argued that most companies described themselves as customer oriented but
few practice this. According to Kotler (2005), customer care attitudes must be
implemented where needs to tract the level of customer satisfaction in relation to
competitors’ level of customer satisfaction.

The study reveals that pavement condition would improve service quality and
satisfaction of the highway users. More emphasis should be focus on the
improvements on the existing condition of the pavements. Highway operators should
focus on the supervision and the professionalism of its employees. This is to ensure
that the services rendered to the customer are according to specification and
requirements. The Highway operator must ensure that the service performance meets
the minimum standards. The role of employees needs to be clarified and ensure that
all employees understand how their jobs contribute to customer satisfactions. In order
to enhance performance and service quality, the most appropriate methods and
reliable technology and equipments must be selected.

5.4 Limitation of Research

There are numbers of limitations within this research study. The limitation relates to
the data sample and the range of variables contained within the research model. The
data was gathered from the highway users at the Northern part of the highway. It only
focus on convenient areas at the Rest and Service Areas at the Northern Region of the
Expressways. The variables of the research model especially on the Technical
Construct and dimensions only based on the experience and discussion of the authors
within the PLUS Expressway Berhad.
5.5 Recommendation for future research.

The amount of research pertaining to service quality and customer’s satisfaction is increasing, and there are still ample topics meriting investigations. HIWAYQUAL should be tested to other privatised highways and expressways in Malaysia. Furthermore it can also be tested for non-privatised roads as the maintenance of the non-privatised road is carried out by consortium of companies. Further research can analyse the barriers to implementing programs of service quality as well as customer satisfaction and ways to overcome the barriers. Study the level of tolerance in order to meet halfway. Another area in need of study is an additional of construct to improve the existing instrument. Image could be one of it.

Additionally, future research should also compare the perceptions of service quality and expectation between Regulators, highway operator and the highway users. This research is to extent the knowledge findings on the perception of quality service among different categories.
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