BY LAND OR SEA?

An investigation into the travel preferences and potential for ferry patronage of the residents of the Whangaparaoa Peninsula

A thesis presented in partial fulfillment of the requirements for the degree of Master of Management at Massey University, Albany, New Zealand.

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ABSTRACT

The aim of this study was to establish an understanding of the travel preferences of the residents of the Whangaparaoa Peninsula with a view to assessing the likelihood of future patronage of a ferry service from the Whangaparaoa Peninsula to downtown Auckland and to North Shore City. The factors that impact on the travel decision-making of residents in respect of ferry travel were identified, to assist both operators and local bodies responsible for the provision of transport infrastructure in their planning for improved ferry services from the Whangaparaoa Peninsula.

A survey of residents of the Whangaparaoa Peninsula was conducted by way of a self-reply postal questionnaire sent to a random sample of 700 residents over the age of 20 years. The questionnaire was designed to collect data concerning current travel behaviour and stated preferences in respect of ferry travel. A total of 308 completed questionnaires were received. A second self-reply questionnaire was administered by the researcher to patrons of the current Gulf Harbour commuter ferry service. Twenty-seven responses were obtained to this questionnaire, which asked ferry users for information about travel patterns and their opinion of the attributes of the service.

Analysis of the data collected by the survey shows that almost half of the commuting population of the Whangaparaoa Peninsula travels regularly to central Auckland or North Shore City and by far the most popular mode of transport is the private car. Despite the majority of those travelling by car experiencing significant delays due to traffic congestion, many have expressed satisfaction with their current travel mode due to the convenience and flexibility it affords.

The current ferry service from Gulf Harbour carries little of the total commuter population but a significant proportion of respondents have indicated they would be likely to use a ferry service, even occasionally, if a terminal was located at Arkles Bay. There is no great support for a service calling in at Browns Bay en route for downtown Auckland due to concerns over the extra total travelling time this would entail.

The factors identified by both current and prospective ferry users as crucial to continued and future patronage are an increase in service frequency, reliability and reduced trip time, comfortable seating and a competitive pricing scheme. There is some interest in integration of both the fare package and the service with other transport modes. This information can be utilised by ferry service operators in their marketing and operational planning.

This research has indicated a fair level of interest in the continuation and upgrading of the current ferry service from the Whangaparaoa Peninsula. These findings are of value, for future decision making and planning, to the bodies involved in the provision of ferry transport, including the Auckland Regional Council (ARC) and Auckland Regional Transport Limited (ARTNL).

In addition to its practical management applications, this research has contributed to the body of travel behaviour knowledge in respect of both non-users' and users' perceptions of ferry travel. The attributes of the ferry service which respondents have indicated are influential in the choice to travel by this mode, reflect the factors recorded in travel behaviour research as influencing the use of other public transport modes such as bus or rail. These findings have therefore provided a deeper understanding of urban ferry travel behaviour and have enabled a model for the travel decision-making by residents of the Whangaparaoa Peninsula to be developed.

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CHAPTER ONE

INTRODUCTION

Public passenger transport systems are currently a focus of regional development and planning bodies in the Auckland area (Auckland Regional Council, 2002; North Shore City Council, 2000). Moves to improve road systems are seen as necessary, but there is concern that this will simply lead to increased use of private motor vehicles and hence increased congestion, and there is evidence to suggest this has already happened (North Shore City Council, 2000). The Energy Efficiency and Conservation Authority has cautioned that transport now outstrips the industrial sector in energy use and New Zealand has the highest CO_2 emissions from the transport sector (45%) in the OECD (Kennedy, 2000). Public transport is seen as a way to combat transport energy use and thus help the economy and the environment (Kennedy, 2000).

One mode of public transport that has the potential to address concerns over pollution and congestion is ferry travel. Auckland is geographically suited to a ferry network and indeed a ferry service has operated for many years, linking particularly the North Shore to downtown Auckland. The Auckland Regional Council (ARC), in its draft Auckland Regional Ferry Strategy (PPK Environment & Infrastructure Pty Ltd, 2000), has indicated its commitment to developing a strategy that assists in reducing peak hour traffic congestion and that increases the share ferry travel has in regional commuter travel.

As part of the strategy to improve the public transport network in the Auckland region, a regional LATE (Local Authority Trading Enterprise), Auckland Regional Transport Network Limited (ARTNL), has been established. One of its objectives is the upgrading of existing ferry terminals and the construction of new terminals

around the shores of Auckland to introduce new services at new locations (Auckland Regional Council, 2002).

An area of the greater Auckland region that is experiencing considerable population growth is the Whangaparaoa Peninsula in Rodney District (PPK Environment & Infrastructure Pty Ltd, 2000). This growth, in combination with the geographic constraints of a peninsula, is contributing to serious access problems for those who live on the Whangaparaoa Peninsula (Jamieson & Williams, 1998).

Rodney District Council (RDC) has been working on plans to address the access issue for many years. A strategic approach to finding solutions was articulated in the 1996/97 Annual Plan (RDC, 1996). It required the RDC to identify the best solution for the transport needs of the Whangaparaoa Peninsula, based on the wider environmental, social, and economic impacts of the alternative options. The most recent draft Annual Plan for 2003/2004 reiterates the desire "to progress a solution to Whangaparaoa Peninsula traffic congestion" (RDC, 2003, p.8).

In its consideration of alternative solutions, the access options study commissioned by the RDC (Jamieson & Williams, 1998) recommended that the ferry be part of the long-term strategy and that the use of the ferry be encouraged. The improvement of ferry services will provide additional flexibility for commuters between the Whangaparaoa Peninsula, the North Shore and Downtown Auckland.

The studies conducted to date have focussed primarily on the physical practicalities of providing a ferry service from the Peninsula (Jamieson & Williams, 1998) and "future patronage potential". The latter was estimated from assumptions about population growth, the proportion of work trips to downtown Auckland and the ability of the ferry service to achieve a level of frequency and time savings to compete with other travel modes (PPK Environment & Infrastructure Pty Ltd, 2000).

Current travel behaviour literature supports the validity of obtaining data based on the "stated preferences" (what individuals state they would like to do) of potential travellers as well as observing their current travel behaviour (revealed preferences) (Louviere & Hensher, 2001). No studies have specifically researched the stated travel preferences of residents of the Whangaparaoa Peninsula to assess the likelihood of them switching to ferry travel.

This study therefore seeks to "fill the gap" and complete the travel picture for the residents of the Whangaparaoa Peninsula in connection with their travel to downtown Auckland and to North Shore City. The focus is on both their current travel patterns and their attitude towards the present and possible alternative ferry services.

ARTNL has indicated that such a study of residents of the Whangaparaoa Peninsula would be of value to their assessment of potential services, as the existing Gulf Harbour ferry service is currently not well patronised and not cost effective (FerryBiz Solutions Ltd, 2001b). There is a need to ascertain whether an improved ferry service would be patronised and whether residents of the Whangaparaoa Peninsula would be likely to prefer a ferry terminal at another location on the Peninsula.

Achieving an understanding of the needs, expectations and impressions of Whangaparaoa Peninsula residents in respect of ferry travel can also, if the improvements appear warranted, form a valuable basis for the design and marketing of the revamped service. No such research has been conducted to date in this area.

The research questions on which this study is founded are therefore the following:

- What are the travel preferences of the residents of the Whangaparaoa Peninsula for journeys from the Whangaparaoa Peninsula to central Auckland and to North Shore City?

- What factors are likely to lead the residents of the Whangaparaoa Peninsula to travel by ferry to central Auckland or to North Shore City?

This study is primarily a descriptive one (Zikmund, 2003) seeking to determine specifically the likelihood of ferry patronage by Whangaparaoa Peninsula residents and the considerations which lead to ferry patronage. Implicit in this research, however, is the search for an answer to the broader question of why individuals choose to travel by ferry.

Layout

The thesis is presented in six chapters. Chapter Two reviews a wide range of literature from the fields of consumer behaviour, travel behaviour, public transport, services management and urban transport planning that demonstrate consistent themes in the travel decision making process for individuals. Marketing and feasibility studies of ferry and other transport and access options are discussed together with relevant local and regional transport planning documents.

Chapter Three sets out the research objectives and the methods employed in this study to attain them. Details are given of the survey method applied, including the sampling frame, pre-test, questionnaire format and administration of the two questionnaires. There is an explanation of the techniques used for analysing the data and a discussion of the limitations of both the method and the data obtained.

Chapter Four provides a comprehensive presentation of the results of the analysis of the data collected with the two questionnaires. Charts and tables aid in the visual

representation of the frequencies and cross-tabulations of responses. Statistically significant relationships between variables are identified using chi-squared tests of association.

Chapter Five contains a discussion of the results set out in Chapter Four and the implications of those results for a ferry service from the Whangaparaoa Peninsula. A travel decision-making model is developed, based on a model for tourist travel buying behaviour discussed in Chapter Two.

Final conclusions are made in Chapter Six together with recommendations for both ferry operators and those responsible for the transport infrastructure in the region. The chapter closes with suggestions for the direction of future research in this field and a reflection on the significance of the findings.

Plate 1.1 Gulf Harbour ferry berthed at downtown Auckland

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Public transport systems involve many stakeholders with wide ranging desires and expectations. Governments and local authorities, particularly in industrialised nations with large urban centres, are concerned with the efficient and effective deployment of resources that will facilitate the movement of commuters and other travellers around their cities and environs (Brog, 1993; Auckland Regional Council, 2002). In efforts to ease congestion, minimise pollution, and increase commercial and tourist activities in their regions, these bodies are constantly looking for means to improve services and increase patronage of modes of public transport.

Passengers, be they commuters, tourists, or leisure travellers, also desire cost-effective, reliable, timesaving means of travelling in and around major centres (Chandler, 1996). The behaviour of public transport users and the reasons for their choice of a particular mode of travel have been the subject of numerous studies conducted by those working in many fields. These fields include economics, psychology, planning, tourism, marketing and management (see Hensher & Stopher, 1979; Golob, Horowitz & Wachs, 1979; Chandler, 1996; Pizam & Mansfeld, 1999). Individual transport operators are interested in the outcomes of these studies for commercial reasons and public bodies are constantly seeking information to aid the direction of transport policy.

The area of passenger preferences and travel behaviour touches on a range of disciplines and in order to provide a theoretical framework for this research a broad selection of literature has been reviewed. General writings on salient public transport issues have been examined and a brief outline of aspects of the extensive research into consumer behaviour has provided a backdrop to the more specific travel behaviour literature.

The service management field is closely interwoven with both consumer behaviour and the delivery of transportation services as part of the infrastructure of an economy (Fitzsimmons & Fitzsimmons, 2001). Aspects of urban planning and studies of the relationship between urban form and transportation have been integrated into a review of public transport issues. Further detailed information on urban transport planning is available in works by Campbell (1993), Chandler (1996), Cervero (1996) and Gane (1999).

This chapter presents a review of local and international literature concerning public transport and the behaviour and preferences of passengers from a range of research fields as set out in Figure 2.2.1 below. Local transport studies and reports for the Auckland and, more specifically, the Whangaparaoa region are considered.

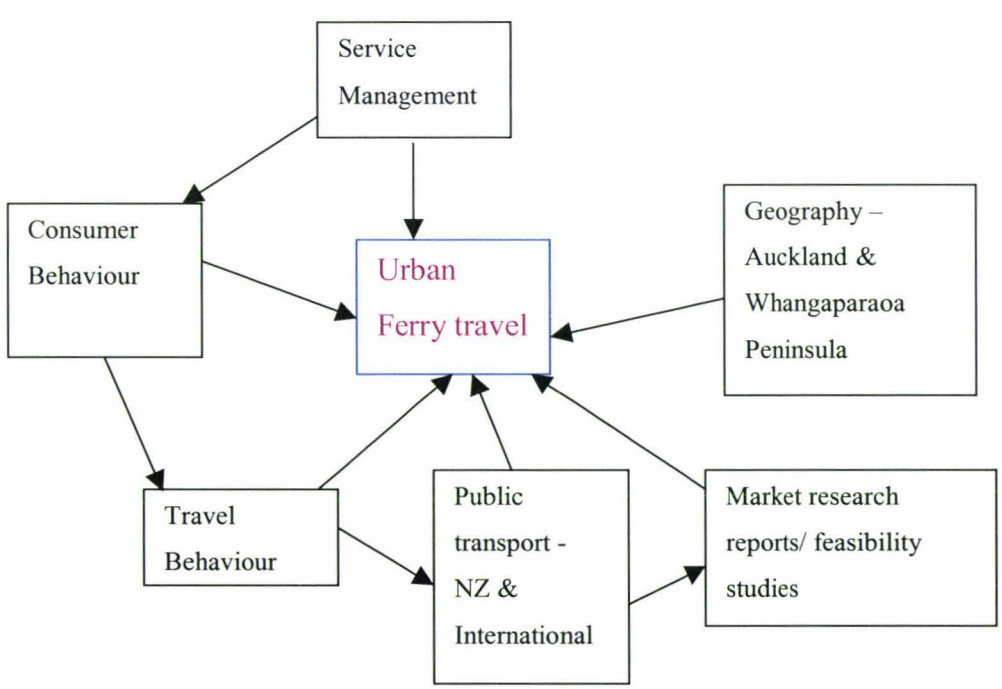
Common factors influencing users' choice of travel mode are identified, which are of assistance in the design of the present study. The methodologies employed in research across these topics are discussed briefly in this chapter where particular studies are considered, but are discussed in more depth in Chapter Three, where the methodology for the research presented in this thesis and its implementation are explained.

2.2 Method of searching literature

The literature searched includes electronic (Business Source Premier, Academic Elite Search) and bibliographic sources, internet web sites, together with reports commissioned by local authorities and transport organisations. The searches were limited to English language material published from 1957 to July 2003 inclusive. Material referenced in retrieved publications was also identified.

Publications were included if they provided information concerning studies relating to consumer behaviour, public transport use and travel behaviour. Papers and publications were selected if they included academic research and particularly if they included discussions of research methodology in this field.

Figure 2.2.1 Research fields forming the Literature Review



2.3 Consumer behaviour

"Consumer behaviour covers the acquisition and use of goods and services by individuals or households" (East, 1990, p.1).

Those who travel by public transport are by definition consumers of a service. A large body of literature exists covering many facets of consumer behaviour and discussing the variety of models used to measure and assess them. Each product or service being consumed has particular features that will influence the type of behaviour exhibited by the consumer (Bettman, Luce & Payne, 1998).

The various models of consumer behaviour that have been formulated are adapted by researchers in more refined fields where the behaviour of a particular sector of consumers is being studied. One such field is that of public transport. Many consumer researchers have identified the vital role of this service industry in a country's infrastructure (Faivre D'Arcier & Steffen, 1993; Natalisa & Subroto, 2003).

2.3.1 Decision-making

In essence, consumer behaviour consists of a series of decisions (Bettman et al., 1998; Kotler, Brown, Adam & Armstrong, 2001). It is of interest to researchers involved in marketing and those developing a broader policy framework, in the case of transport, to discover why, as well as how, when and who is likely to use a particular service. Also of interest is why or how that choice may change.

Despite a range of interpretations of the consumer decision process, writers concur in the fact that a variety of processes accompany different types of decisions (Howard & Sheth, 1969; Bettman et al., 1998; Tavares, 2003). A common approach is the division into four types of behaviour depending on the level

of involvement of the consumer and the difference between the brands available: complex buying, dissonance-reducing, habitual buying and variety-seeking. The highest level of involvement and range of brands leads to a complex process whilst low levels and range leads to habitual behaviour (Kotler et al., 2001). The behaviour of transport consumers tends to fall within the latter category as a result of a lower range of options, and thus many regular travellers have formed habits in their travel decision-making.

Other important features of the process include the needs of the consumer, the consumer's perception of attributes of the service (Kotler et al., 2001; Tavares, 2003), and the level of satisfaction achieved relative to expectations (Decrop, 2001). The "cognitive dissonance", or lack of comfort with the inevitable compromise involved in choosing between alternatives (Festinger, 1957; Kotler et al, 2001) is a feature of many consumer decision process studies.

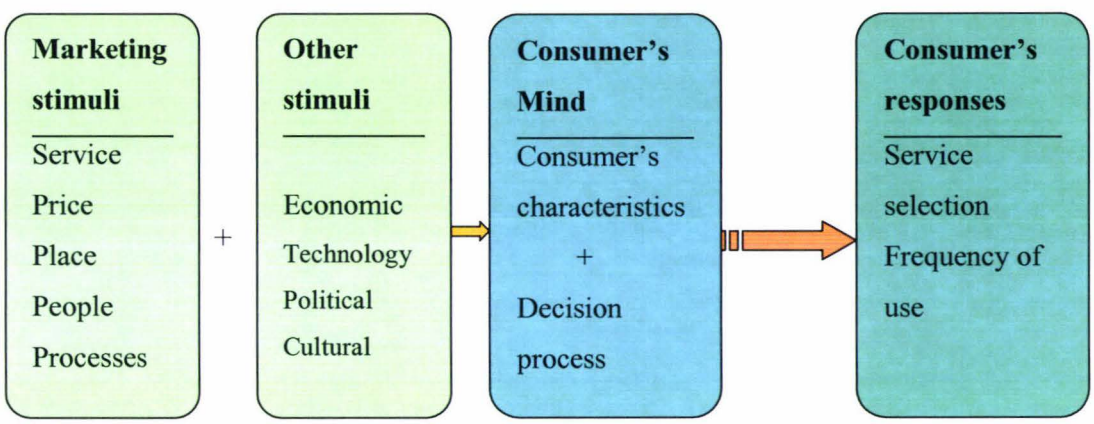
Recent papers discussing consumer decision making are showing a change in an understanding of consumer preferences (Bettman et al., 1998; Drolet, 2002). Research by Drolet (2002) and others now suggests that consumers change preferences as much because they like making a change as for any other set rationale.

This supports the view that consumers seek variety in their choices of both goods and services. It also goes further to suggest that consumers seek variety in their decision making processes (Drolet, 2002). Whether this extends to consumers of transport services, where a great variety of options does not exist, has yet to be tested. Nevertheless, this view on consumer behaviour provides a broader appreciation of consumer decision-making than the traditional more "rational" approach.

Consumer behaviour stimulus-response model

To establish a clear picture of consumer behaviour, much research has focussed on how consumers respond to marketing and other stimuli (summary of models in Schiffman & Kanuk, 1994, p.644—56). All the factors that influence a consumer in a particular choice are considered, such as the stimuli, characteristics of the consumer and how the decision is made. The responses these lead to are then observed. Figure 2.3.1 shows a stimulus-response model setting out these factors:

Figure 2.3.1 Consumer behaviour model



Source: Adapted from Kotler et al., 2001, p.193.

2.3.2 Influential factors

According to Kotler et al., (2001) it is possible to divide the main characteristics which influence consumer behaviour into internal psychological and personal factors, and external factors from the surrounding cultural and social environment.

Personal characteristics

The personal characteristics researchers have identified as most influential in the behaviour of a consumer are the family life-cycle stage, age, education, occupation and economic situation (Reilly, Eroglu, Macheit & Omura, 1984; Schopphoven, 1991; Kotler et al., 2001). Psychology has become a useful tool for marketing

research. The "psychographics" (Farnsworth Riche, 1989; Foxall and Goldsmith, 1994) are becoming an important focus of consumer behaviour studies where writers in this field concur on the need to examine the motivation, perceptions, attitudes and learning, both behavioural and cognitive, of consumers (Foxall & Goldsmith, 1994; Kotler et al., 2001).

Many of these personal characteristics are linked and can influence both the needs and wants of the consumer as well as the ability to purchase a certain service (Burghouwt, 2002). The trend in consumer behaviour studies is increasingly to examine these needs and desires of the consumer, from the perspective of the consumer.

Satisfaction

The satisfaction or dissatisfaction of consumers with their purchase of goods or services has been the subject of many studies, resulting in a range of theories and models (Ritchie, 1994; Widing, 2003). It is of particular popularity in marketing literature since the assessment by consumers of their level of satisfaction following purchase has been shown to influence future behaviour (Decrop, 2001).

In a tourism context, the necessity of conducting "research related to post-experience feelings and behaviour with a view to understanding the impact of previous travel on future choice behaviour" has been promoted by Ritchie (1994, p.11). Some of the theories concerning dissatisfaction consider it to be "an attributional problem" (Decrop, 2001, p.334). In other words, where the service provided does not justify the cost to the consumer, dissatisfaction results. This theory supports the notion that external factors, such as the transport supplied, rather than internal factors such as expectations will lead to dissatisfaction. Decrop (2001) provides references to many theorists who have evidence to support this approach.

In contrast, many writers concur that consumer satisfaction arises where expectations are matched or exceeded by performance (Bateson, 2002; Natalisa & Subroto, 2003). This "disconfirmation theory" was first developed by Pizam, Neuman and Reichel (1978) and has since become well entrenched in marketing and consumer research. Some are now challenging such a simplistic approach and call for a more profound investigation of the impact of satisfaction or dissatisfaction on future consumer behaviour (Decrop, 2001).

The longitudinal study conducted by Decrop (2001) in relation to summer vacations highlighted the range of factors that appear to influence satisfaction or dissatisfaction with a service such as the transport mode. Emotional and social considerations, as well as comparison with expectations or prior experience and assessments of cost/benefits all featured in his results. An important finding was that satisfaction does not always lead to repeat behaviour when emotions or variety seeking are at play and equally, dissatisfaction does not always lead to a desire to change.

Much research has concentrated on different approaches to measuring satisfaction with products or services (Oliver, 1997; Pizam & Mansfeld, 1999; Friman & Garling, 2001; Bateson, 2002). Satisfaction can be regarded as overall satisfaction with a service or product, or satisfaction with individual attributes of the service's or product's performance (Friman & Garling, 2001).

Other studies have looked at how the performance of the consumers themselves can affect their level of satisfaction with a service (Hui & Bateson, 1991; Bateson, 2002). The "scripts" learned by the consumers about a service will determine how expert they are at using the service. Those who are expert and knowledgeable tend to have higher levels of satisfaction (Bateson, 2002). These writings suggest that service providers should ensure that they cater for both experienced and inexperienced "novice" consumers and thus achieve higher levels of consumer satisfaction (Hui & Bateson, 1991; Bateson, 2002). Good information about

a service can assist consumers to make full use of that service and become "experienced".

Sensory experience

Many authors now suggest that price is less of a factor in determining whether a consumer will purchase a service. What is more influential is the "sensory" experience of consumers (Decrop, 2001; Berry, Carbone & Haeckel, 2002; Bateson, 2002).

Berry, Carbone and Haeckel (2002) have identified two sets of "clues" in addition to the obvious operative aspect of the service, which relate to the emotional aspect of the consumer experience. The "mechanics" are given out by the non-human part of the service, such as comfortable seats or enticing smells. The "humanics" are clues relating to the people delivering the service. Combined, these sensory aspects of the consumer's experience greatly influence the decision-making process.

Constraints

The point has been made by some writers, contradicting earlier studies of consumer choices, that in many cases the amount of choice available to consumers is less than previously thought (East, 1990; Jones, Dix, Clarke & Heggie, 1983). Limitations of choice may stem from a lack of resources, lack of time, lack of information and lack of alternatives (East, 1990).

Another approach to the issue of constraints is a consideration of those who *do not* use a service. Despite little research being undertaken directly in relation to those who opt *not* to use a service or product, Hudson (1999) has stressed the importance from a marketing viewpoint of identifying and understanding those who fall into this category of *non-users*.

This issue of *constraints* on behaviour is a recurring theme in the more specific travel behaviour literature which is discussed in the next section (Goodwin, 1985). In tourist research some researchers have examined constraints on travel and the effect this has on individuals choosing not to book a particular journey (Stemerding, Oppewal, Beckers, & Timmermans, 1996). This approach could be refined to look at those who do not use public transport, when it is an option, and any constraints on travel experienced by them.

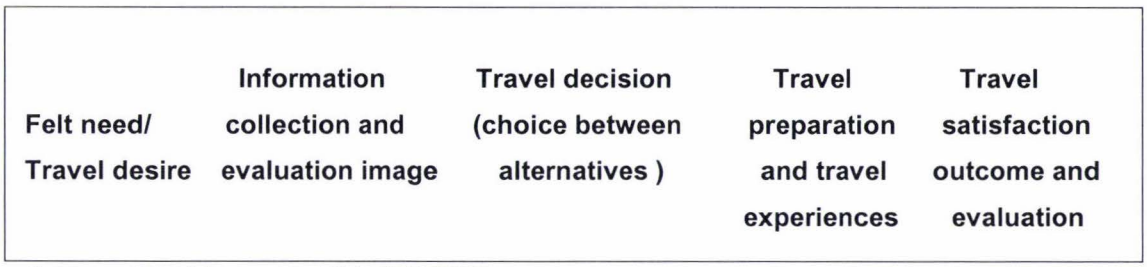
2.3.3 Consumer behaviour in tourism

Tourism is an area in which a growing body of theory and research is focussing on related aspects of consumer behaviour (Swarbrooke & Horner, 1999; Crouch & Louviere, 2001). It has much relevance to general travel behaviour since all tourism includes an element of travel.

Swarbrooke & Horner (1999) and Hudson, (1999), provide a useful summary of many consumer behaviour constructs that have been applied to tourism. Few have been tested through empirical research, and the simplicity of what are mainly linear models is questioned by Swarbrooke and Horner on the basis that tourist travel behaviour is complex.

This simplicity is not necessarily so limiting when looking at regular daily travel patterns. Constraints of daily work, study or family schedules do not allow for the same scope as tourists may experience in a holiday situation. Linear models are therefore of interest and an example is Mathieson and Wall's (1982) five-stage model of travel buying behaviour, shown in Figure 2.3.2.

Figure 2.3.2 Travel-buying behaviour



Source: Mathieson and Wall (1982)

The stages of behaviour attributed to an individual in the model set out in Figure 2.3.2 can be applied clearly to the processes most individuals experience when travelling for any reason. By breaking the process down into its component stages useful factors can be identified which will help gain an understanding of travel preferences.

Another recent comprehensive model for tourist behaviour adapted by Hudson (1999) from Moutinho, has many features that could be adapted for public transport passengers. The three parts, as broad divisions, could apply to decisions concerning the choice of daily travel mode:

a) The first part is entitled the "predecision and decision processes" which involves personality, environmental influences and family influences creating a "preference structure". This combines with travel information and past experience to contribute to the decision making (Hudson, 1999).

b) The second part is entitled "postpurchase evaluation" and relates to the level of satisfaction with the service purchased. This influences future behaviour (Hudson, 1999).

c) The third part is "future decision making". Different probabilities for subsequent repeat buying are analysed (Hudson, 1999).

The three sections could be modified to provide a useful insight in to what factors influence the choice of public transport or other modes of transport for regular travel. In particular, the level of satisfaction or dissatisfaction experienced by a passenger would be likely to impact on future travel choices and could be introduced to such a model.

Characteristics influencing tourist behaviour

The factors suggested by Swarbrooke & Horner (1999) as influences upon tourist behaviour are similar to those which appear in the general consumer behaviour literature. They include the personality, lifestyle, past experiences and personal circumstances of the individual tourist.

To some extent the distinctions which are made between business tourists and leisure tourists (Swarbrooke & Horner, 1999) can apply also to those who travel from home for business and those who travel to carry out other activities such as shopping or recreation. As with the business tourist, the advancements in communication technology are seen as a possible threat to the business commuter market as the need to travel to do business is reduced. This emphasis on the activity or reason for the travel will be explored further in section 2.4.

2.3.4 Summary of consumer behaviour literature

Consumer behaviour research emphasises the various internal and external factors that influence an individual's decision to purchase goods or services. Psychological elements such as motivation and perceptions contribute to the decision of the consumer. The lifestyle of the consumer is considered important, as are the constraints upon the alternatives truly available to an individual.

Such considerations are of value in this investigation into public transport consumer preferences, where there is an interest in the likelihood of

travellers changing their regular transport mode. This approach suggests the importance of establishing why the target population has chosen a particular form of transport and what factors may lead to a change in that choice.

The consumer behaviour research suggests that a comprehensive study of any consumer behaviour, such as travel behaviour and ferry travel preferences, should include questions concerning aspects of the travel experience other than cost. Factors such as comfort and quality are valid points to be considered.

Much writing focuses on the measurement of satisfaction with attributes of a service or the service as a whole, as this is seen to affect future consumer choices. This literature has relevance to this thesis as in order to assess the likelihood of ferry patronage by the target population, it is necessary to consider the levels of consumer satisfaction with both the existing ferry service and with alternative means of transport. Both overall satisfaction and individual attributes of the alternative transport modes should be considered.

Tourist consumer behaviour literature provides relevant linear models for travel decision making which form a useful basis for analysing the stages in travel behaviour. They take into account the various factors that impact on an individual's travel decision-making process and have the potential for being developed further to assist the analysis of the travel preferences and behaviour of the residents of the Whangaparaoa Peninsula.

2.4 Travel behaviour

2.4.1 Introduction

The area of travel behaviour research has become a specialisation drawing on many disciplines from geography and engineering to planning and economics, and more latterly psychology and sociology. It seeks to investigate the increasingly complex issues of human travel utilising tools from this range of disciplines, with a focus on the relationship between individuals and their travel decisions (behaviour). Theoretical travel behaviour modelling has been concerned primarily with the movement of urban passengers (Hensher and Stopher, 1979).

Much of the research designed to uncover the factors that determine travel behaviour is carried out from not only an academic viewpoint, but also from a practical business perspective (Pizam & Mansfeld, 1999). These studies look at a raft of different aspects of travel behaviour, from commercial travel and personal travel through to public transport.

2.4.2 Background

Over the last 50 years the theories on which travel behaviour studies have been based have been refined. Arising from the need to establish procedures to forecast travel demand in the face of rapid growth in car use, a standardised four-stage methodology emerged in the 1960s (Wilson, 1974; Hensher & Stopher, 1979). There was soon dissatisfaction with these models. It became apparent that they were inaccurate and simplistic in their portrayal of modal choice as separate from other aspects of travel behaviour, and in their suggestions that therefore it was relatively easy to persuade car users to switch to public transport (Jones et al., 1983).

Literature concerning the actual experience of policy initiatives that restricted car use and promoted public transport, show that the models made assumptions which ignored reality. In particular, the interrelationship of travel and non-travel aspects of life and the effect of the behaviour of members of a household on the travel choices of each other were not considered (Jones et al., 1983).

Researchers then began to seek ways to better model true travel behaviour and a well received piece of work was conducted by a group from the Oxford University Transport Studies Unit (TSU) over the course of five years (Jones et al., 1983). The TSU group formed an activity approach, based on the urban planning adoption of the sociological/anthropological human activity studies (Chapin, 1974). This was one of the early moves away from a focus on past travel trends towards a broader examination and understanding of travel *behaviour.*

2.4.3 Socio-demographic factors

A body of research has focussed on the study of travel behaviour from both a sociological/psychological and economic perspective. Many studies conclude that socio-demographic characteristics of the population have a definite impact on the choice of travel mode (Golob et al., 1979; Gane, 1999). For example, research that compared the impact of urban form characteristics with those of socio-demographic factors on travel distance and trip frequency found that the socio-demographic characteristics appeared more influential (Handy, 1995).

These results point to the importance of considering socio-demographic factors in an analysis of travel behaviour. Some of the most common approaches to analysing different socio-demographic aspects of travel behaviour include the activity and lifestyle approaches.

Activity based analysis

The *activity approach* figures prominently in up to date travel behaviour literature. Recent writing in this field explains that the popular economic random utility theory has been combined with the rules based paradigm from psychology to provide a more rounded research model (Hensher and King, 2001). This approach ties in with the activity paradigm for decision making which has been adopted by a number of researchers in preference to the previous trip-based modelling techniques (Jones et al., 1983; Brog, 1985; Goodwin, 1985; Hensher and King, 2001; Steg, Geurs & Ras, 2001). The *activity approach* to travel behaviour has shown that to truly understand travel mode choice, it is necessary to consider the general context of travel behaviour by looking at the activities of the whole household (Goodwin, 1985; Hensher and King, 2001).

A significant part of the activity approach is the consideration of *constraints* upon choice of travel mode that may arise from the household situation (cf. paragraph 2.3.2). It has been established that time is such a constraint for many travellers and can restrict the choice of travel mode more than distance (Jones et al., 1983).

Linked to this, a consideration that has a real influence on travel choices and on general travel patterns is children and the impact of their needs (Goodwin, 1985). Time can be closely related to the needs of children where deadlines for collection from daycare, or taking them to activities, enters the complete travel scenario.

Life-style based analysis

Another method of analysing the activities undertaken by members of a household that has formed a basis for travel behaviour research is the *life-style.* For example, the impact of "telecommuting", as part of a lifestyle choice, on travel behaviour has been investigated (Bernardino, Ben Akiva & Salomon, 1993).

Studies are beginning to show a pattern of some potential for reduction in private and public transport costs where individuals who would traditionally commute, are able to work from home (Bernardino et al., 1993). Such life-style choices impact on travel behaviour and any comprehensive survey of the travel behaviour of a particular population must include questions relating to these activities.

2.4.4 Preferences

Chandler (1996) has set out some basic assumptions concerning travel behaviour in the context of his work on the interaction and integration of land use and transport planning. He states that "transport is derived from the needs, choices and decisions of individuals" (1996, p.3).

Reiterating the work of many travel researchers, Chandler acknowledges that individuals make decisions founded on what appear to them to be rational bases. He cautions that the complex nature of these decisions, incorporating considerations such as cost, convenience, mood and status, do not necessarily constitute rational decisions for the system as a whole (Chandler, 1996). His challenge is to find a means to bridge the gap between the travel preferences of individuals and an effective efficient transport system.

This view focuses on the subjective nature of travel behaviour. Individuals weigh up factors that have a direct effect on their own situations, such as how much they are able to spend on transport, and do not necessarily consider the wider implications of such choices. These assumptions fall in line with much empirical research into travel choices (Carlsson, 2003), which indicate a need to make allowances for individual preferences when planning public transport strategies.

The importance of the relationship between the preferences of an individual and the travel choice or behaviour exhibited was expressed some years ago by Golob,

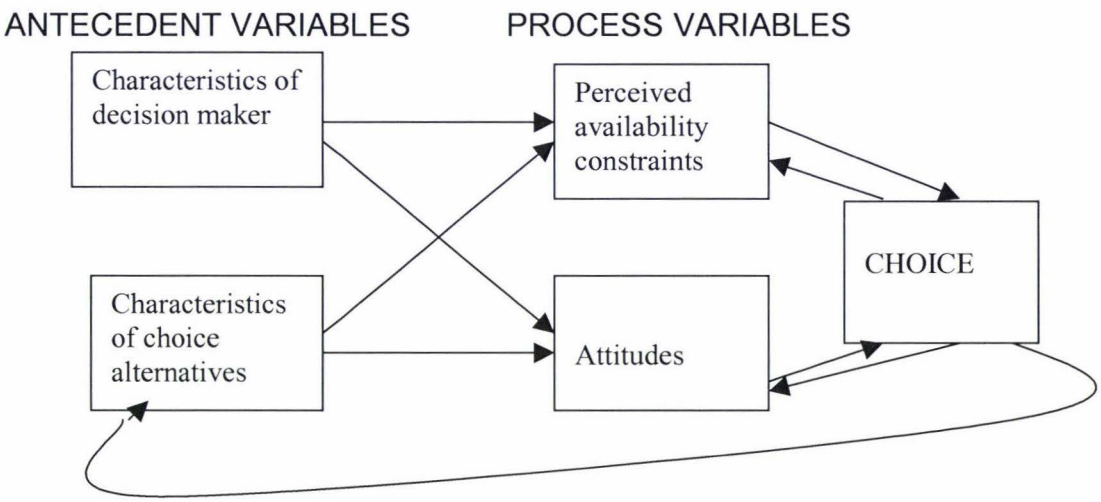
Horowitz and Wachs (1979). Other writers including Louviere (1979; Crouch & Louviere, 1999) and Wilson and Piccolo (Louviere, Wilson & Piccolo, 1979) were also early pioneers of the application of psychological theory to the study of travel behaviour.

Golob et al. (1979) made the point that although travel demand models had started to look at both "manifest" (revealed) preference data and "conceived" (stated) preference data they were incomplete in so far as they concentrated on the relationship between variables at one particular point in time. These researchers stressed the importance of gaining insight into the decision processes that were behind a given choice, in order to understand fully the implications of attitudes or preference variables for travel behaviour.

One such theory, suggested by Golob et al. (1979) is "cognitive dissonance" (cf. section 2.3.3 above), which is integral to the conceptual model of travel decision-making displayed in Figure 2.4.1. This theory holds that the attitude of an individual will be adjusted once that individual has made a choice so that the alternative selected, along with its positive and negative attributes, will be seen as more satisfactory, than those not selected (Golob et al., 1979). So called "captive" passengers on a particular service who have no readily accessible alternative means of travel, have been shown by empirical research to have a lower level of satisfaction with that service than those who have more room for choice (Golob et al., 1979).

The conceptual model separates antecedent variables from process variables. Antecedent variables are those over which the individual does not have immediate control, such as age, and number of children. The process variables cover the perceptions and attitudes of the individual. The most important relationship identified in this model is that between the characteristics of the choice alternatives and the attitudes.

Figure 2.4.1 Conceptual model of travel decision making



Source: Golob et al., 1979.

It follows that attitudes towards travel determine, and are determined by, travel choices, which are in turn influenced by what is available (Golob et al., 1979). This link between attitude and choice is now being employed in transport planning as it is being shown that attitudes or preferences are important factors in future behaviour. Though past behaviour has an influence, attitudes can indicate a change when there is a change in the alternatives for travel mode. These writers suggest that analyses of travel attitudes or preferences are crucial to developing innovative transport plans and promoting effectively the advantages of particular transport alternatives.

Aggregate data of beliefs, evaluations or preferences can identify the main attributes of different possible alternatives. Aggregate attitudinal measures are considered to be reliable (Golob et al., 1979).

2.4.5 Motivation

In line with consumer behaviour writing, Steg et al. (2001) reinforce the view expressed by Chandler that the *motivation* of passengers for their travel choices is an important factor and should be incorporated into passenger transport models. They suggest that until recently little attention had been given to motivational factors because transport modelling has traditionally been the work of geographers and urban economists. Psychologists and sociologists are just beginning to contribute to this field and information gained concerning the perceptions and attitudes of passengers can be influential at a policy making level (Golob & Hensher, 1998).

The issue of motivation had been broached by Brog in 1985 in a study of German urban travel choices. He saw that the increase in travel choices, as cars became more affordable and public transport improved, led to the importance of understanding an individual's *motivation* as an element in that mode choice (Brog, 1985). He questioned the concentration by transport planners on simply the supply of public transport and discussed the need to look at the "soft" aspects of policy, such as the demand for services to fulfil the needs and desires of individuals.

Steg et al. (2001) consider that travel behaviour and motives are interdependent in so far as individuals' motives are affected by their use of a particular mode of transport and equally their motives influence the choice of transport mode. Many motivational variables have been identified in empirical studies and associated literature in relation to car use and choice of travel mode. They include attitudes towards different modes of travel, social norms, personal norms, being aware of the problems caused by car use and a perception of responsibility for those problems (Steg et al., 2001).

These considerations echo those identified in the consumer behaviour literature (section 2.3) and are relevant to decisions concerning the choice of public

transport as an alternative to car travel. Some of the specific factors that have been identified in research as impacting on travel behaviour are discussed more fully below.

2.4.6 Factors influencing choice

The design of the urban environment is closely allied to the urban transport system and its infrastructure and hence impacts on the travel behaviour of the population it serves (Gane, 1999; Burghouwt, 2002). Travel demand is highest where land use is most dense, such as a CBD. The use of cars and public transport can satisfy that travel demand. Policies that aim to decentralise urban areas will equally influence the transport systems and the corresponding travel behaviour.

A study was carried out in Toronto by Miller (1993), that looked at the relationship between mode choice and parking demand in urban central areas. The cost of parking and time taken to walk from the parking area were compared with other factors influencing commuters' travel mode choice such as travel time. The parking issues were shown to have a greater impact than travel time and fares. Other studies in the United States have reinforced the importance of parking in travel mode choice (Cervero, 1996).

Miller (1993) made the point that to form a greater understanding of the role parking plays in the travel mode choice of commuters, it would be of value to survey the attitudes of car drivers and the reasons for their car use. These comments reinforce the growing awareness of the benefit of obtaining information from commuters and others concerning their travel preferences to complement the large body of data collected by observing actual travel behaviour (revealed preference data).

Time, as an influential factor in the decision process, has been considered from a number of viewpoints (Jones et al., 1983; Booz-Allen & Hamilton (NZ) Ltd & Hensher, 1999). Researchers have cautioned that it is important to clarify in any study whether travel time includes the total trip time, from leaving home to reaching the destination, or the time spent using a particular mode of transport for part of a journey. Time is inevitably linked to distance and the importance of the trip time depends often on the type of trip (business or leisure).

Time can also be split into waiting time, in-vehicle travel time and the alternative use of time can be assessed (Ortuzar, Ivelic & Candia, 1997; Ortuzar & Gonzalez, 2002; Wojahn, 2002). This concept is important for ferry travel where passengers are able to read, study or work, particularly on a long journey. Time can be better spent whilst travel is taking place on the ferry, than with car travel, where the driver does not have the opportunity to make use of travel time for other activities.

Habit will also influence choice. It is a preference which alters once a change in transport mode has been made (Goodwin, 1985) and relates to the type of journey being undertaken. Research indicates that it is stronger when there is little or no choice available for an alternative mode of transport and comes from a choice often influenced by social and economic factors. Many studies indicate that there needs to be a great deterioration in the current mode to switch (Goodwin, 1985).

Papers presented at the recent Australasian Regional Transport Forum (October 2003) have stressed the difficulty of breaking existing travel habits when trying to encourage more use of various forms of public transport (Stopher & Gordon, 2003). Some individuals will not change mode because of misconceptions concerning the reliability or levels of comfort of a service, or because of a lack of appreciation of the real costs of a service, compared with alternatives. Many writers have recognised that not all these "constraints" are realistic, but are part of an individual's perception or attitude towards a type of travel service (Golob et al,

1979; Brog, 1993). An understanding of the subjective nature of travel decision making is necessary if research is to be of benefit in transport planning.

A factor that has been identified as influential in decisions to change travel mode is the level of understanding by the individual of the potential benefits of making that change (Pharaoh & Apel, 1995; Garling & Sandberg, 1997). In some studies of the effect of policies to limit car use in cities, individuals have shown higher degrees of willingness to change from car use to more "environmentally friendly" travel modes, such as walking, cycling or public transport, where they appreciated the benefit of that change (Pharaoh & Apel, 1995).

Other studies have had contradictory findings where intentions to change travel modes in hypothetical situations did not correspond with a stated concern over air pollution from cars (Garling & Sandberg, 1997). A suggested explanation for some inconsistent results is the difference between intentions to change travel behaviour and actual behaviour where individuals have changed their minds (Garling & Sandberg, 1997). This latter point is important to keep in mind in the present study where respondents may state a desire or likelihood of using a particular travel mode, but in reality, may never act on that intention.

Perhaps surprisingly, cost has been found in many public transport studies to have limited influence on modal choice on its own (Brog, 1993). The rationale given for this is the relatively small impact of travel costs on an individual's or household's economic situation where the travel is for short distances. Even significant rises in fare prices or increases in fuel costs for car users usually can be and are absorbed by commuters. This indicates, that, as some researchers suggest, price can influence choice in respect of the formation of travel habits (Goodwin, 1985).

Travel behaviourists go on to say that cost is more a decision factor for longer trips as it has more of an impact financially (Goodwin, 1985). The present study considers the travel preferences of a population situated at a reasonably

significant distance from the city centre (approximately 65km), but still to be considered within commuting distance. It may be wise therefore to investigate the influence of price on travel mode choices in respect of this population.

In the case of business passengers, research has confirmed that business passengers have high expectations of service attributes other than cost (Carlsson, 2003). The reason for this result is the fact that although this segment of passengers does not have to bear the cost of the trip, most business passengers still choose their mode of travel.

Carlsson (2003) concludes that it is important to measure passenger preferences rather than the ticket purchasing company's preferences. Costs affecting the passenger such as time, comfort and reliability are more significant to them than the ticket cost borne by the company. Even commuters who bear the cost of regular travel themselves have shown a tendency to favour high quality transport services (Brog, 1985; Wojahn, 2002). The improvement of the frequency, reliability and comfort of transport modes have been more influential in attracting patrons than price incentives (Brog, 1985; Wojahn, 2002; Carlsson, 2003).

2.4.7 Service management

The service aspect of travel modes and transport systems is important to the decisions made by consumers. The management of transport services, by both the commercial operator and the local authorities that provide the infrastructure, has an impact on travel behaviour. Ignoring customer concerns, neglecting quality and failing to plan strategically for the long term can affect the patronage of services such as public transport (Fitzsimmons & Fitzsimmons, 2001).

The service management field overlaps with those of marketing and consumer behaviour as a result of the high involvement of the consumer in the delivery of

services (Faivre D'Arcier & Steffen, 1993; Fitzsimmons & Fitzsimmons, 2001). Many of the factors noted in travel behaviour research as influential to the travel decision making process are considered by service management theorists in the context of how the service can be managed most efficiently and competitively.

Issues of demand and supply impact on the frequency of the service offered and the frequency of the service and reliability play a significant part in the level of service quality provided in the transport sector. How to deliver quality is an important aspect of service management research as the level of service quality directly impacts on the satisfaction experienced by the consumer (Hostage, 1975). In turn, the level of satisfaction with the service provided by public transport operators has a bearing on the level of patronage of those services.

2.4.8 Summary of travel behaviour literature

Brog (1985) cautions that studies cannot measure or necessarily be aware of all the factors that influence travel behaviour. Nevertheless certain findings in the travel behaviour literature are consistent and suggest the basis for some appropriate questions to achieve an appreciation of the travel preferences of the sample population.

The focus of researchers is clearly now on the motivation and preferences of individual travellers as the key to understanding travel behaviour. The factors that have been identified as likely to influence the travel decisions include internal factors such as the activities and lifestyle of the individual and their household.

Alongside these are the external factors such as the quality of the service (comfort, reliability, travel time, frequency, simple ticketing), its cost, urban form and parking options, availability of alternatives (habits) and a true understanding of the benefits of a particular mode of travel.

These same considerations are examined by theorists in the service management field as they look at how to deliver a quality service. Successful management of a service such as public transportation requires a clear understanding of travel behaviour.

2.5 Public transport

"Transport systems...have a fundamental influence on the general quality of our lives" (Hutchings, 2001 p.9).

Public transport, the travel services provided for the general population, forms a significant part of transport systems. The wide reaching impact on all facets of life of transportation systems, particularly urban transportation, has led to a wealth of research and corresponding literature from a great variety of disciplines (Taebel & Cornehls, 1994).

Studies have historically tended to focus on travel demand and land-use planning (Chandler, 1996; Cervero, 1996). There is consequently little academic research into travel behaviour relating specifically to ferries and ferry travel will be examined separately in the following section. Likewise little research has been conducted to investigate the reasons for choosing between different forms of public transport, such as between bus and ferry services. However, the models employed and the scope of general public transport research can be directly related to water-based travel and it is therefore useful to consider this body of knowledge.

Traffic engineers, economists, environmentalists, urban planners, sociologists and political scientists have contributed to what has become a diverse and slightly disorganised body of literature. Taebel and Cornehls (1994) have attempted to bring some order to this mass of articles and books and have classified as "the

balancer" those who seek a balance between the provision of a public transport system and limited car use. Public authorities are viewed as the parties able to provide some balance between private producers and users of transport. The constraints on achieving such a balance through urban planning are acknowledged. This issue, which stems largely from historical developments and geographic limitations on choice, will be addressed later in this chapter.

2.5.1 Social impact

From a social perspective, writers are now stressing the need for adequate public transport systems to provide for the carless groups. Employment opportunities are often decentralised and a comprehensive metropolitan transport system is necessary to cater for this (Koutsopoulos & Schmidt, 1994). The activities undertaken by the carless groups are an important factor in public transport planning and the "activity" approach (Brog, 1993; Hensher & King, 2001) to travel behaviour research, discussed in the previous paragraph provides an appropriate model to incorporate the needs of a variety of groups. This concept is based on the premise that in regular travel from home, the reason for that travel is an activity out of the home (Brog, 1993).

The link between "prosperity and mobility" (European Conference of Ministers of Transport (ECMT), 1993, p. 184) is a concern and public transport is one way public authorities can work to alleviate the growing gulf between the mobile sections of society and those that are limited in mobility (Cervero, 1996). The use of the car and the urban planning that has accommodated the increasing number of cars in cities has, according to Cervero, segregated cultures: "old from young, home from job and store, rich from poor" (1996, p.48). Public transport routes need to reflect the travel patterns and meet the requirements of all sectors.

By virtue of being a service provided for the public at large, public transport and other forms of transport are closely allied with current public policy issues. Public authorities recognise the link between a strong local economy and an efficient public transport system (Auckland Regional Council, 1999; ECMT, 1993; Ortuzar et al., 1997).

Authorities are starting to recognise the importance of using research into consumer perceptions of the various attributes of the public transport system to be able to provide services that will be well patronised (Ortuzar et al., 1997). There is consensus in public transport writings (ECMT, 1993; Ortuzar et al., 1997) that as greater choices are available for most regular travellers, in order to compete effectively for customers, it is important to be aware of all users' needs (De Boer, 1994; Hensher, 2000).

The most effective way of keeping in touch with the desires and expectations of those users is through surveys of both current and potential users, seeking information about what activities instigate travel, and consequently what services are needed (ECMT, 1993; Ortuzar et al., 1997). This knowledge is important when evaluating or planning services as the type of activity will often dictate the type of transport required to meet the transport needs (for example, the need to take heavy or large equipment, or carry shopping).

One important area of public transport policy is the desire to combat the effects of high levels of car use in and around cities (Pharaoh & Apel, 1995; Ortuzar et al., 1997; Burghouwt, 2002). The rationale behind many policies is the reduction or at least minimisation of car travel into urban centres as many studies have highlighted the detrimental environmental, social and economic effects of automobile use in cities (Gane, 1999; Douglass, 2001).

The effect of car ownership on public transport patronage is well documented (White, 2002). In addition to the main car user choosing not to take public

transport, other household members may take advantage of the car to obtain a lift to another destination and many can travel in the one car for trips. Thus many former public transport patrons are lost to one car. Apart from limiting car use through systems such as traffic bans in city centres and parking control, the promotion of public transport is seen as a "pull" strategy (Pharaoh & Apel, 1995, p.238).

The focus by local authorities in urban centres on "automobility" (Cervero, 1996) or the movement of individuals by private car (Dalvi, 1979), has given way to a movement to alter the paradigm, to plan more for "accessibility" than "mobility" (Dalvi, 1979; Cervero, 1996). This is another move towards concentrating on the individuals and their needs in terms of accessing or reaching a destination, rather than looking at transportation systems in isolation.

Individuals desire to arrive at a destination swiftly so that time can be spent at that destination, rather than en route (Dalvi, 1979). By extension, the suggestion is that means of transport should be sought that minimise congestion and ease the travel from one location to another. The Whangaparaoa Peninsula is a case in point, where congestion is a serious issue and it is imperative that travel modes other than the private car are fully investigated to allow for accessibility. Public transport is crucial to providing this accessibility (Brog, 1993; Cervero, 1996) as well as having the potential to address environmental concerns over increasing fuel emissions from high car use.

2.5.2 Strategies to increase patronage

Much of the international literature concerning public passenger transport concentrates on rail and bus transport, as these are by far the most common forms of public transport. Nevertheless, many features of these systems are analogous to other modes of transport and can give indications of successful strategies for increased patronage (Hensher, 2000).

The "density" of the service, in terms of networks, and the frequency, correlate with high usage, as do accessibility for disabled passengers; simple integrated tariff systems; and integrated modes of transport such as rail and bicycle use (Pharaoh & Apel, 1995; Henhser, 2000). Empirical studies in Europe have highlighted various approaches to public transport issues that have shown quantifiable improvements in terms of the objective of increased patronage (Pharaoh & Apel, 1995).

In Freiburg a successful strategy to promote public transport tapped into its environmental benefits and the public desire to "go green" (Pharaoh & Apel, 1995). An "environment protection ticket" was introduced in the 1980s to allow travel on the city's public transport system at a reduced cost for anyone in possession of the ticket at the time. This fully transferable ticket was extremely popular and resulted in many travellers changing from car to bus and rail for their regular trips.

This was extended out to the wider region with a "go-as-you-please" ticket that allowed for travel by bus and rail on all local and regional services. These tariff systems were supported by Bike-and-Ride and Park-and-Ride facilities, to provide a well-patronised, comprehensive, public transport package. The city also subsidised the cost of public transport travel to support its use.

Quality of service

As public transport providers have become more aware of the increasing competition between transport modes, the focus has shifted from simply supplying a service, to ascertaining the needs of existing and potential users (ECMT, 1993; Carlsson, 2000). Attributes that have been identified in surveys of public transport users as most important vary according to the income bracket of the respondent and whether travel is at peak or off-peak times (Ortuzar et al., 1997). The central factor in deciding upon a particular travel mode however is now the quality of that service (Carlsson, 2003).

Quality is made up of the following elements (Brog, 1993; Pharaoh & Apel, 1995; Ortuzar et al., 1997; Olsson, 1993): frequency, comfort, in-vehicle time, travel cost, accident risk, reliability, waiting time and simplicity of ticketing. This would have more of an impact on attracting users than price changes.

European studies that have examined aspects of quality in public transport likely to encourage increased patronage (ECMT, 1993; Brog, 1993; Pharaoah & Apel, 1995) emphasise the importance of frequency of public transport services, particularly in small to medium size locations. This entails higher costs for providers and possibly initial subsidies by local authorities to instigate the more frequent service.

Another important factor which has been identified as key to a quality public transport service is the level of comfort provided by that service (ECMT, 1993; Ortuzar et al., 1997). Comfort can involve the seating, amount of room provided and issues of overcrowding.

Public transport users also demand a fast service that will save them time in their daily activities (ECMT, 1993). Inability to provide this speed of service means travellers are not likely to change to public transport. Reports on new express public transport systems such as the express bus system in parts of Sweden, indicate that a frequent, comfortable fast service can achieve high levels of patronage (Olsson, 1993).

Subsidies

Subsidies are viewed as a strategy to keep costs low to encourage use of public transport and in some cases are seen as "socially desirable" (Roson, 2000). Many local authorities subsidise public transport by sometimes over 60%. Examples are the Sydney ferries: 41% and San Francisco ferries: 68% (FerryBiz Solutions, 2001).

Comparative studies in Europe have shown that some cities have managed to keep fares relatively low but still cover 60%-70% of costs, by running an efficient frequent service that generates a healthy revenue from tickets (Pharaoh & Apel, 1995). Even in cities with less than 100,000 inhabitants, a public transport system can be well patronised and run with no greater subsidy than larger cities if the service is attractive, frequent, and the tariff is favourable (Pharaoh & Apel, 1995). Ferries are particularly expensive to run (personal communication, R. Daniels, 15 May 2003) and the issues of cost will be addressed in the following section concerning ferry travel.

Satisfaction

Various studies have examined the reasons given by passengers for choosing modes of travel other than public transport and researchers have undertaken some discussion about levels of satisfaction with public transport services (Brog, 1993; Friman and Garling, 2001). Recent studies have recognised that in order to provide a well-patronised efficient service, public transport companies need to understand why customers are satisfied or dissatisfied with the service and have developed a variety of approaches to measure satisfaction. In some cases overall satisfaction is assessed, or individual service attributes tested.

A study of consumer satisfaction with the service on domestic airlines in Indonesia (Natalisa & Subroto, 2003) examined the factors affecting satisfaction using regression analysis. Results showed that the consumers' perceptions of service quality were a significant factor. The popular SERVQUAL multiple-item scale for measuring service quality was employed (Parasuraman, Zeithaml & Berry, 1988). This instrument is designed to incorporate the many tangible and intangible dimensions of service quality and is well-regarded as a means of assessing customer satisfaction with any service (Fitzsimmons & Fitzsimmons, 2001).

Consumers' perceptions of the quality of service related to five SERVQUAL dimensions of tangibility, reliability, assurance, empathy and responsiveness (Parasuraman et al., 1988), the latter being the only dimension with little impact on consumer satisfaction (Natalisa & Subroto, 2003). On time departure was the variable that differentiated between satisfaction and dissatisfaction whereas price appeared to be of little relevance. The lack of impact of price on satisfaction levels is explained by the fact that most travellers were either business passengers and do not pay the fares or they were from a high income bracket (Natalisa & Subroto, 2003).

In the study carried out by Friman and Garling in Goteborg, Sweden (2001), in addition to these satisfaction measures, an assessment of the impact of "negative critical incidents" (Friman and Garling, 2001, p.848) was carried out. The impact of incidents that were particularly dissatisfying, such as extreme service delays, were recorded. The experiences of public transport users were analysed and the study concluded that the critical incident technique was useful, but to achieve a comprehensive picture of passenger satisfaction with public transport, a multi-method approach to researching this aspect of travel is needed (Friman and Garling, 2001). This result reinforced earlier theories on the effect of service performance on satisfaction (Oliver, 1997).

Communication

Expectations of, and satisfaction with a service have been shown to relate to the consumer's level of knowledge about the service (Bateson, 2002). Studies show that approximately one out of two motorists in urban areas with good public transport systems knows little about the service (Brog, 1993). The poor communication of the real opportunities to take this alternative transport is common with many urban transport systems and contributes to an ill-informed negative attitude towards public transport (ECMT, 1993). The benefits of car use in contrast to public transport are also often exaggerated in terms of convenience, cost

and travel times (ECMT, 1993).

To raise public awareness with the aim of increasing public transport use, public transport must be *perceived* as a "real behavioural alternative" (Brog, 1993, p.17). Communication is seen as the key to convincing potential users of the communal benefits of the public transport system, particularly from an environmental standpoint (Goodwin, 1985; Cervero, 1996).

2.5.3 Change in travel behaviour

Brog (1993) provides a useful analysis of public transport travel decisions with an example from the Ruhr corridor in Germany. In his study 13% of all trips were by public transport. He divided the travelling public who did not use public transport into five categories:

i) Those who do not use public transport because of "practical constraints" such as needing their car for work (26% of all respondents);

ii) Those who have no alternative because public transport does not serve their destination (40%);

iii) Those who do have an alternative but subjectively do not believe this , perhaps through lack of knowledge (16%);

iv) Those who could use public transport and are aware of this, but have a negative opinion and choose not to for their own reasons, such as cost, time, comfort, etc (2%);

v) Those who could use public transport and have no negative opinion, but still exercise their discretion not to use public transport (3%).

Of the 13% of trips that are by public transport, 7% are made where a suitable alternative exists and are thus made by those who freely choose public transport.

This type of analysis identifies different categories of existing or potential public transport users to whom targeted marketing strategies can be addressed. This understanding of the public transport market is applicable to any travel mode and is helpful when seeking to understand why certain groups may or may not choose to patronise a particular service.

2.5.4 New Zealand

The key role played by transport systems in the cohesion of society and its impact on our environment have placed transport policy at the forefront of national and local government agenda in New Zealand over the last ten years or more (Hutchings, 2001). The public transport issues that face New Zealand are in line with those facing the majority of developed countries. Most writers allude to the growing reliance on car travel which is out pacing growth in urban populations and the accompanying concerns over increased congestion and pollution (Hutchings, 2001; Douglass, 2001).

A focus of transport policy has therefore been measures to combat the difficulties associated with high car use ranging from roading improvements to expansion and promotion of public transport. Figures from 1997/98 show that from their rates revenue, Regional Councils were spending $41.3 million on bus, ferry and rail services (Hutchings, 2001). This level of expenditure has not diminished and indicates the importance of these services to the infrastructure of the entire country.

Despite this focus, in the context of the Auckland geography and government import policies, Aucklanders' strong preference for car use (Dunlop, 1996) means

that they have not embraced public transport. It is reported that only 14% of commuters use public transport to travel to work (Heal, 1997).

Historically, employment was concentrated on the Isthmus of Auckland and workers commuted from the suburbs. From the latter part of the 20th century, employment has become more dispersed across the region, the central business district in 1999 accounting for only 12%-13% of regional employment (Gane, 1999). As a result, there is a need for a public transport system that can provide services across diverse routes to many destinations.

The Auckland Regional Land Transport Strategy (ARC, 1999b) sets out the policies for Auckland up to 2050 which are designed to accommodate the growth in "nodes" of higher density and transport corridors. These plans are more conducive to travel by cycling, walking and public transport. Land transport is also seen to have a role in supporting the increasing use of water transport. The Auckland Regional Passenger Transport Action Plan (ARC, 1999c) contains the implementation detail of the land transport strategy which includes plans for more use of the harbour.

Transport studies carried out in Christchurch over the period 1969 to 1996 show a decrease in the importance of trips to work, when compared with the increase in trips to other activities (Douglass, 2001). The results of these studies are comparable with the information gained concerning Auckland. It appears that many trips have multiple purposes and the car is therefore the favoured mode of transport to travel to a succession of different locations (Douglass, 2001). If public transport is to compete with the car on this basis it appears that a full integration of both public transport services and also other non-vehicular means of transport must be achieved.

Integration

Despite the promotion of alternatives to increasing the road system, such as cycling, walking and public transport, a common theme in studies of transport systems in New Zealand is the lack of successful integration of these various options (Hutchings, 2001; Douglass, 2001). Not only is the integration of services and travel options recommended, but also commentators put forward the need for integration of transport planning at all policy making and implementation levels, to incorporate the economic and social impacts of transport systems (Douglass, 2001).

The outcomes of international studies indicate two ways of creating networks that cater for the diverse travel plans in an area such as the greater Auckland region, where activities are dispersed and the car is widely used. These are "tangential" routes for the public transport network and "multi-modal" travel (Pharoah & Apel, 1995). The former promotes links between services such that waiting times are minimised and fare systems are integrated to avoid any financial penalty or inconvenience to those who travel using more than one service.

The second approach involves the provision of facilities to allow the smooth transfer from one mode to the other, such as Park and Ride or cycle parking at either end of the journey. Providing for carriage of bicycles on public transport also enhances the flow of travellers from dispersed activities to those that are more centralised and within reach of better public transport services (Pharoah & Apel, 1995).

Attempts to establish and develop an integrated bus and ferry operation have been made over the last five or six years, with the Link service between operators Fullers and the Yellow Bus Company (McManus, 1998). A further step in this direction has recently been taken in Auckland, where in March 2003 a six-month trial began of an integrated pass allowing unlimited travel on local bus, ferry and train services over a 24 hour period (Thompson, 2003).

Seven public transport operators, not including the Gulf Harbour ferry operators, have collaborated in the introduction of the pass, which covers services ranging from Wenderholm in the north down to Papakura. They have overcome competitive rivalry to share information necessary to set up the integrated system and it will be interesting to observe the outcome of the trial.

Local Studies

In New Zealand, studies of public transport issues have, for the most part, been produced by private service providers, local authorities or the national roading body Transfund. The latter body has commissioned research on a range of transport issues, utilising various research models and theoretical frameworks derived from international practices (Booz-Allen & Hamilton (NZ) Ltd & Hensher, 1999; Gammie, 1998; Booz-Allen & Hamilton, 2000b).

Two recent studies concerning public transport in New Zealand look at the issues of the value to be placed on individual components of a public transport journey (Booz-Allen & Hamilton, 2000b) and measurement of public transport services to provide a performance system of benefit per $ subsidy of public transport (Gammie, 1998). The subsidy performance study raises some interesting issues concerning the difference between subsidy/passenger boarding and subsidy/passenger-kilometres. In the case of the existing Whangaparaoa Peninsula ferry service there is a substantial subsidy and few boardings, although the distance covered is relatively significant in terms of kilometres.

These studies are of interest in that they indicate some areas that have been investigated in relation to public transport in New Zealand, but do not bear directly on the focus of this study, the travel preferences of a segment of the greater Auckland population. It is interesting to note that in this research performance is based solely on the quantitative aspect of patronage of all public transport services and does not investigate the qualitative issues.

2.5.5 Summary of public transport literature

Most of the public transport literature reviewed discusses strategies for increasing use of public transport as an alternative to the private car and the results of research into current trends in public transport patronage. International research is relevant to the New Zealand situation, particularly the Auckland region, which is experiencing the same issues as cities world-wide associated with population growth and the increasing use of the private car for commuter journeys.

New Zealand research consists, for the most part, of purely quantitative data based on current travel patterns, designed for the construction of demand forecasting models. An opportunity exists therefore for more investigation into the stated preferences and the reasons for those preferences of potential public transport patrons in New Zealand, particularly for ferry travel.

In the context of this particular paper, it is clear that issues of satisfaction with the present means of transport, both public transport and personal car are relevant to determining travel preferences for the subject population. The satisfaction of travellers with existing services must be considered when assessing the popularity of those services and the likelihood of continued or increased patronage.

The integration of services, together with the quality of those services, are seen as the key to a successful "city-friendly transport strategy" (Pharoah & Apel, 1995). For the benefits and features of any public transport system to be appreciated, good communication to the general public of their worth is essential.

2.6 Ferry travel

Very little literature is available concerning urban ferry transport. The reason for this, suggested by Dr Rhonda Daniels, the Strategic Planning Manager of the State Transport Authority of New South Wales, Australia (personal communication, 15 May, 2003), is that most systems are small and each city has its own unique characteristics. This is undoubtedly true of the Auckland situation, but a comprehensive paper on planning ferry services using research, based on results from extensive studies carried out in Sydney (Daniels and Streeting, 2002), provides a useful approach to understanding a service that has some similarities with the Auckland situation.

Other international studies of ferry travel have identified some commonalties in the factors that lead passengers to choose ferries over other forms of transport. Various studies of ferry use in the Auckland region have been conducted over the last five years by ferry operators and by consultants commissioned by local authorities (Beca Carter Hollings & Ferner, 2000a; FerryBiz Solutions Ltd, 2001a; PPK Environment & Infrastructure Pty Ltd, 2000: Booze-Allen & Hamilton, 2000a). They also provide useful information concerning trends in ferry patronage.

2.6.1 Tourist travel

Urban transport ferry services can attract tourists "as a convenient form of local transport or as an original way to view the city" (Holloway, 2002, p.132). Holloway examines services in many big cities around the world that have become tourist attractions in their own right. These include the New York Staten Island ferry, Hong Kong's Star ferry, the Manly ferry in Sydney, Bainbridge Island in Seattle, Bosphorous in Istanbul and here in Auckland, New Zealand, the services to Devonport and Waiheke.

Hobson & Uysal (1993) emphasise the vital role transport plays in the development of the tourist industry and cite ferry travel as an integral part of the tourist infrastructure. Their concern over the negative impact of traffic congestion on the growth of the tourist industry echoes that of local bodies, which realise the importance of a sound infrastructure to a strong economy. Local authorities in Auckland have stated their desire to develop tourism in the region and have confirmed that the ferry service forms part of this strategy (PPK Environment and Infrastructure Pty Ltd, 2000).

Passenger studies have identified differences in ferry service patronage depending on the season (Graham & Russell, 2001). In winter periods research has found predominantly business commuter use of ferries, whereas leisure use increases in the summer months. The results obtained from any survey of ferry passengers should therefore be analysed in the context of the particular season in which data were collected.

2.6.2 Auckland

Comparisons with other ferry operating systems (FerryBiz Solutions Ltd, 2001a) show Auckland's system to be highly efficient. In the area of subsidies, most cities, including Seattle, Brisbane, San Francisco and Sydney provide public support of 40-70 %, whereas Auckland's subsidy is only 6%. In relation to Sydney, Auckland has a far greater number of ferry users per head of population at a far lower cost.

Ferry travel is very expensive to provide from a supply side, so it is only viable in a market where travel time savings are so great that people are prepared to pay the very high fares needed to recover costs, or where the market has high incomes to pay high fares (R. Daniels, personal communication, 15 May 2003). Subsidies can compensate to some degree for the operating costs.

Internally, a comparison of ferry operating subsidies with those for rail and bus services again shows that ferries receive the lowest level of public funding per passenger (FerryBiz Solutions Ltd, 2001a). Aside from Hong Kong, Auckland is unusual in that private operators own and operate the ferry network.

Reports suggest that despite Auckland having maintained a rare level of profitability, the increasingly competitive nature of the market and the high cost of expansion, in terms of infrastructure and new vessels capable of operating in Auckland, mean that the market may not be sustainable (FerryBiz Solutions Ltd, 2001a).

The issues operators need to address have been identified by technical consultants and include service frequency, capacity requirements, efficiency and passenger comfort (FerryBiz Solutions Ltd, 2001a). These factors reflect some of the considerations identified in the academic travel behaviour research as important to passengers (Brog, 1993; Pizam & Mansfeld, 1999). Studies carried out in respect of local ferry travel and related transport issues are examined further in the next section, 2.7.

The section of the Auckland Regional Passenger Transport Action Plan that addresses the issue of increasing use of the Waitemata Harbour (ARC, 1999b) has four main components:

- Ameliorate existing ferry services in terms of frequencies, facilities and vessels;
- Develop ferry terminals;
- Integrate ferry services with bus and train services;
- Identify possible future ferry service routes.

Some of these objectives are already being implemented with minor improvements to existing terminals and wharf facilities and progress on the major redevelopment of the downtown terminal (K.Brown, personal communication, 10 October, 2003).

2.6.3 International

The indication from international research that the commuter ferry market is highly unprofitable (FerryBiz Solutions Ltd, 2001a; Daniels & Streeting 2000) has already been raised. Nevertheless, ferries remain an important component in many urban passenger transport systems (PPK Environment and Infrastructure Pty Ltd, 2000). Often this is as part of the overall "image" of a city and the level of subsidy provided in many cases by the state reinforces the view that ferries are more than just a means of transport (Daniels & Streeting, 2002).

The draft Auckland Regional Ferry Strategy provides a summary of the key service success factors for the ferry services in Sydney, Brisbane, Seattle, Vancouver and Hong Kong (PPK Environment and Infrastructure Pty Ltd, 2000). It is important to bear in mind that each ferry service operates in a unique geographic, political and economic environment (PPK Environment and Infrastructure Pty Ltd, 2000; Daniels & Streeting 2002). Notwithstanding this fact, certain key success factors, common to all services, have been identified by ferry operators and are set out in Figure 2.5.

These factors, identified in literature as pivotal to successful water transport systems, were presented to the operators from all five countries. The operators then ranked them in the order of importance displayed in Figure 2.5

Figure 2.5 Ferry service success factors

[in descending order of relevance to successful ferry operations]

(1) **Reliability**

(2) **Frequency of service/integration in transport network**

(3) **Travel time on ferry/safety/absence of real alternative/ pleasant way to travel**

(4) **Total trip cost to passenger/environmental performance/ communication/cost of operations (subsidy)/ total travel time by other mode**

Source : PPK Environment and Infrastructure Pty Ltd, 2000

Alongside these sit the factors identified as influential in the choice by individuals of ferry travel over other modes of transport. The draft Ferry Strategy (PPK Environment and Infrastructure Pty Ltd, 2000) cites a number of characteristics which are very similar to those appearing in most travel behaviour and public transport literature as discussed in sections 2.4 and 2.6 above.

The following characteristics are described as most influential:

- Travel time;
- Fare structure (perceived cost rather than actual cost, such as petrol plus parking, rather than full cost of purchase, maintenance of car);
- Service frequency;
- Reliability;
- Access to wharves (facilities which maximise ease of transfer from one mode to another such as bus or car to ferry and vice-versa);
- Access to destinations;
- Passenger comfort and convenience (to compete with the car).

Sydney

Perhaps even more so than in Auckland, ferries are a distinctive feature of the city of Sydney. Over 13 million passengers a year ride the ferries in Sydney Harbour and Parramatta River to over 40 wharves on 2000 services per week (Daniels & Streeting, 2002).

On an average weekday 58% of trips are for commuter use and 45% of all ferry travel occurs between Circular Quay (the hub of the services in the CBD) and Manly. The total of all services shows that on average 45% of ferry travel is for commuter use. This indicates that ferries are widely used for other purposes, particularly at weekends (88%), such as shopping, recreation and "just enjoying a ferry ride" (Daniels & Streeting, 2002, p.6).

Patronage is relatively stable, however financial performance is poor (Daniels and Streeting, 2002). Despite an extensive study reported by Daniels and Streeting (2002) considering over 20 potential service developments, little evidence was found that financial improvements could be achieved. They felt constrained by policy and operational factors in attempts to develop potential business options that resulted from this research.

The research led by Daniels from the State Transit Authority (Daniels & Streeting, 2002) included collection of primary data through stated preference surveys of mode choice. The key attributes seen to impact on mode choice were travel time, price, frequency, reliability and the need to interchange. Ferry users and non-ferry users were questioned in this survey.

A separate survey of ferry users identified characteristics of ferry travel such as the purpose of ferry trips and the time of travel. In this study all 2000 ferry services a week were surveyed.

The key service factors that were found to impact favourably on the appeal of ferries in comparison with other travel modes were frequency and travel time savings. Service deterioration and cancellations were most likely to lead passengers to switch to other modes from the ferries.

The data showed that the perceived cost of interchange from one travel mode to another was higher for ferry users than bus users. Peak ferry users stated they would prefer a 9 minute longer ferry ride rather than have to have an interchange such as bus to ferry. This information provides an interesting insight into the perceptions and preferences of ferry users. It suggests that practical or logistical transport planning focussing solely on the movement of passengers as quickly as possible from one location to another does not always reflect the needs or preferences of the individuals it is aiming to transport.

2.7 Local studies and reports

Consultants and market research companies, commissioned by local bodies and commercial public transport operators across the Auckland region, have compiled a number of reports. They investigate both the existing and potential ferry terminal locations and the attitude of local residents to ferry transport, in contrast to other possible forms of transport from the peninsula to central Auckland. A recent report has also been completed in respect of a possible new ferry service from West Harbour to downtown Auckland (Gomez, 2003).

In 1999 the North Shore City Council (NSCC) decided to plan strategically to improve the passenger transport network for North Shore City (North Shore City Council, 2000). Project FaB (Ferries and Buses) was created as an initiative to identify opportunities for immediate improvements, with the goal: "To identify ways in which local public transport could be improved to better meet the needs of the community" (Booz-Allen & Hamilton, 2000a, p.2).

Consultation was a major part of the project and hinged on a community survey (Public Transport Feedback Form). The results of that survey are discussed below.

The draft Auckland Regional Ferry Strategy (PPK Environment and Infrastructure Pty Ltd, 2000) assessed existing and potential ferry wharf sites and the potential for patronage from those locations. The assessments were made from estimates based on commuter trip information obtained from the 1996 Census and ARC population projections. The stated preferences of potential passengers have not been taken into account.

2.7.1 Auckland

Surveys of ferry users by commercial operators have obtained data primarily concerning satisfaction with the existing service. This has a bearing on continued patronage and can influence the perceptions of possible future patrons through word-of-mouth recommendations (Brog, 1993).

A survey carried out by the operator Fullers, in 1998, (FerryBiz Solutions Ltd, 2001b) measured Service Quality Gaps experienced by ferry users for the seven services into downtown Auckland. The gap between users' expectations and their actual experience was identified along with the importance level to them of the aspects of service measured. Such measurements are widely used in the service management field (Fitzsimmons & Fitzsimmons, 2001).

Results showed overall satisfaction between 74% and 83%, depending on the particular run. Most users pinpointed the poor facilities at the downtown wharf as their main concern, but some showed a significant gap between the expectation and performance for "value for money".

The operators are now using such methods to ascertain how to deliver the most satisfactory outcome from the users' perspective. This approach follows the trend of the re-focussing of public transport studies away from a pure supply issue to a consideration of passenger needs (ECMT, 1993; Carlsson, 2003).

The ARC has produced various transport strategy documents together with action plans, which fit within the broad growth strategy for the region. At the Auckland Regional Growth Forum in 1999 (ARC, 1999a), greater use of ferries and more frequent services were identified as essential to the aims of reducing car use, meeting the needs of households and creating the high quality of urban form desired for Auckland

The draft Ferry Strategy has looked carefully at the possibility of developing many new terminal sites for commuter travel to downtown Auckland. (PPK Environment and Infrastructure Pty Ltd, 2000). One such site that is considered to have real potential for a viable ferry service is Browns Bay. The reasons cited for its potential are the large population within the primary and secondary catchment areas and the high level of orientation for commuters to downtown Auckland. In terms of time advantage, the ferry is considered to be faster than the car by 35 minutes at peak hour, but approximately equal in journey time with the bus.

2.7.2 West Harbour

Auckland Regional Transport Network Limited (ARTNL) commissioned a market research report on the potential for ferry patronage by the residents of West Harbour (Gomez, 2003). No service exists at present but an investigation is underway into the viability of operating a service from the West Harbour Marina to Downtown Auckland. The current travel patterns of the residents were determined in the report, with a particular focus on those who commute to the central city.

The key expectations for a ferry service that were established include affordability, regularity and reliability. The frequency of any peak time service was stressed and residents showed an interest more in the service and value aspects of ferry travel than in physical factors such as terminal facilities and on board extras (Gomez, 2003).

2.7.3 North Shore

The FaB survey was sent out to 4,536 organisations and individuals within North Shore City (Booz-Allen & Hamilton, 2000a). Only 759 were returned (16.8% response rate) and the sample was not representative of the population in regard to gender, community grouping or age. Some useful data were collected, however, particularly in connection with the issues of most concern to respondents. The most frequent issue was the frequency of services, with concern also over cost (fares), nearness of services to both the place of residence and destinations and routes. Other service features such as safety, comfort and accessibility of services were of much lesser concern.

In a comparison between satisfaction with the bus and the ferry services in North Shore City, the bus fared worse than the ferry. A significant number of ferry users were still dissatisfied with the frequency of their services. The reasons given for using the ferry service were traffic congestion, and convenience (Devonport being the main service), whereas bus users were most motivated to use that service because no car was available. The most frequent reasons given for not travelling by public transport were the service not going where needed, service times not being convenient and a preference for car travel.

The results of this survey provide a helpful indication of areas of concern to residents of a location adjoining the Whangaparaoa Peninsula in respect of public transport. The design of the survey is indicative also of the paradigm shift for local

government, away from road improvements, to public transport (Booz-Allen & Hamilton, 2000a). An appreciation of the importance of consumer input to public transport planning is evident in the high degree of public consultation and the emphasis on "community needs" in the Project FaB process.

2.7.4 Whangaparaoa

A report was prepared for Rodney District Council (RDC) by R Cubed Limited (2000) concerning the proposed Weiti Crossing based on a public opinion survey of both businesses and local residents. RDC was investigating a proposal to construct a toll road and bridge over the Weiti Creek to improve access to the Whangaparaoa Peninsula and ease congestion. The survey was conducted by way of a computer aided telephone interview (CATI) with 705 randomly selected residents of the Hibiscus Coast. In addition 132 randomly selected businesses were interviewed.

The main focus of the survey was to gauge the opinion of the respondents in connection with the crossing proposal. At the same time, one of the objectives was to assess the level of support for the proposal as opposed to other options, including public transport. The findings indicated that local residents showed slightly greater support for improved public transport than any other options, whereas businesses were more in favour of the Weiti Crossing.

The "big issues" raised by respondents to general open ended questions highlighted concern over increased traffic and congestion in the region. Even more respondents voiced this concern when a specific question regarding population growth was asked. The need for better transport systems was mentioned in a number of cases.

The final report on access options (Jamieson & Williams, 1998) recommended a crossing at the Weiti River together with some widening of Whangaparaoa Road. It also carefully considered various alternatives including improvement of public

transport systems by ferry and bus.

The assessment of environmental effects in the access options study (Jamieson & Williams, 1998) concluded that such measures were necessary to complement any roading improvement. It was considered that the ferry might replace the car for a limited proportion of the population only, but was an important long-term strategy and the use of the ferry should be encouraged. The access options study considered previous studies conducted during the early 1990s by the ARC and reached the same conclusion that improved ferry services around the North Shore would provide increased flexibility for commuters and an alternative means of commuting between the Whangaparaoa Peninsula, the North Shore and Downtown Auckland.

Other studies commissioned by RDC and the Auckland Regional Council (ARC), which has overall responsibility for provision of public transport in the region, have looked at a variety of public transport options to ease traffic congestion on the peninsula. The 1999 Regional Land Transport Strategy prepared by the ARC for the period 1999-2004 states as part of its policy that it aims to provide bus and ferry passenger transport services connecting the Whangaparaoa Peninsula, Orewa, Albany and Auckland CBD (ARC, 1999b).

The discussion paper prepared by Beca Carter Hollings & Ferner (2000a) notes the belief by Fullers that Weiti River would be a more suitable location for a ferry terminal than Gulf Harbour, being a more central base for the Whangaparaoa Peninsula population. In the Whangaparaoa Access Options Study carried out over 1997 and 1998 (Jamieson & Williams, 1998) Weiti River, Arkles Bay and Gulf Harbour were the three ferry terminal sites investigated on the southern shores of the Whangaparaoa Peninsula (see map in Appendix A). Sites on the northern side of the peninsula were not selected owing to the additional travel time required to round the peninsula.

Existing road access, deep water close to the shore and sufficient shelter from wind and waves were the criteria for identifying these sites. Of the three possible locations, it was concluded that Gulf Harbour was the most viable long term due to the existing facilities. To construct terminals at the other sites would require substantial engineering works resulting in negative social and environmental impacts.

The draft Ferry Strategy prepared for the ARC (PPK Environment and Infrastructure Pty Ltd, 2000) does not consider any terminal other than Gulf Harbour on the Whangaparaoa Peninsula. It presents a review of all existing wharf sites around Auckland and in relation to Gulf Harbour notes that a low proportion of total work trips are to downtown Auckland, in 1996, only 11.5% of those work trips being by ferry.

This report does, however, recommend that the existing service be maintained. It also recommends that in order to increase patronage and overall share of the commuter trips to downtown Auckland, the advantages of the service in terms of travel time, over travel by bus or car, be promoted. In addition, the need to investigate ways to improve the reliability of the service in adverse weather conditions was noted (PPK Environment and Infrastructure Pty Ltd, 2000).

The possibility of linking the existing service from the Whangaparaoa Peninsula to downtown Auckland with a service from another East Coast terminal has been considered as an opportunity to increase overall patronage, in the long term (Jamieson & Williams, 1998; personal communication, K.Brown, ARTNL, 9 June 2003). The terminal recommended in the draft Ferry Strategy as having most potential of all East Coast sites, in the short term, is Browns Bay (PPK Environment and Infrastructure Pty Ltd, 2000).

The draft Ferry Strategy does consider the possibility of linking a service from Browns Bay to a future service from Takapuna, over the long term, but has

not investigated linking the Gulf Harbour service with a service to or stop at Browns Bay. The attitude of Whangaparaoa Peninsula residents to a service that links in with Browns Bay either as a destination or as a stop en route for downtown Auckland has not yet been established.

2.8 Geographic factors

Auckland

Auckland is undeniably a city experiencing considerable growth. The population of Auckland was estimated at 1.2 million in 1999 and it is expected to reach 1.46 million by 2016 (PPK Environment and Infrastructure Pty Ltd, 2000). Much growth is also taking place in the area to the north of Auckland, in the direction of the Whangaparaoa Peninsula, in particular in the Albany area. This is an area of diverse activities including the university, stadium, new commercial zone and residential pockets (Gane, 1999).

Highest activity levels for the Auckland region as a whole are still concentrated in the central city district. It is possible however, that many living in the Whangaparaoa Peninsula area may now be commuting to locations away from the centre and therefore their travel requirements do not include regular trips to the city centre. Indeed a recent traffic survey undertaken for Rodney District Council (Beca Carter Hollings & Ferner, 2000b) shows that only an estimated 9% of morning traffic originating on the peninsula, travelled south of the Harbour Bridge whereas 27% travelled to the North Shore, including Albany. These factors must be taken into consideration when assessing the viability of public transport options from the Whangaparaoa Peninsula.

Whangaparaoa

The Whangaparaoa Peninsula is situated within Rodney District. It has a population of approximately 23,508 (Statistics New Zealand, 2001) served by one main arterial road the length of the peninsula which becomes congested at peak commuter times.

The report from the 2001 population Census (Quinn & McGregor, 2002) notes that cities in the Auckland area are showing above average increases in the "census usually resident" population count. It goes on to show that districts surrounding cities that are exhibiting strong population growth include Rodney, with a growth rate of 14.6% compared with 1996 Census results. Of locations with existing ferry services, Gulf Harbour on the Whangaparaoa Peninsula is an area experiencing higher than average growth for the Auckland region (PPK Environment and Infrastructure Pty Ltd, 2000).

The peninsula has a bus network, but there are problems of access as the main arterial road is on a ridge and bus passengers often face a steep walk to bus stops (Beca Carter Hollings & Ferner Ltd, 1998). The limited ferry service to downtown Auckland currently operates one trip from Gulf Harbour at 7.10am on weekdays, returning from downtown Auckland at 5.35pm. Services run occasionally at weekends, but are not regular.

Gulf Harbour is located at the eastern arm of the peninsula and can only be accessed by travelling along the often heavily congested main arterial road, Whangaparaoa Road. Residents of the western end of the peninsula are in close proximity to the recently opened motorway extension that can be accessed at Silverdale or Orewa and allows relatively fast travel by car to the North Shore and to the city.

2.9 Summary

It is clear that urban transport research has swung away from simply providing planning data for car access and an interest in the supply side of transportation. It now shows recognition of the need to encourage less environmentally detrimental forms of transport and to focus on the *needs and preferences* of the existing and potential users of different modes of transport.

Local authorities in the Auckland region are facing the same issues of increasing traffic congestion from car use and a growing population as many cities in the world. They have initiated policies to overcome some of these problems, an important one being the development and further integration of the regional public transport network. Improvements and expansion of the existing ferry service form part of the regional transport strategy.

Local studies have indicated support for further investigation into the possibility of improving public transport from the Whangaparaoa Peninsula and have highlighted the ferry service as an important part of that transport system.

Researchers in the travel behaviour field have indicated the value of looking at the stated preferences of potential transport users and combining this hypothetical data with observations of actual travel behaviour to create a clear understanding of long term travel behaviour. No recent research has been conducted into the travel preferences of the residents of the Whangaparaoa Peninsula.

Both the international and local literature reviewed in this chapter has highlighted certain trends in consumer and travel behaviour research. It has been possible to identify factors in the travel mode decision-making process that can form the basis of a worthwhile study into the travel behaviour of the residents of the Whangaparaoa Peninsula.

The key factors are the personal characteristics and lifestyle of the decision-maker, external factors such as traffic congestion, access, availability and type of alternative modes of transport and the attributes of the travel modes. The individual attributes that have been proved to influence decisions regarding the choice to take public transport include:

- Length of journey time;
- Level of comfort;
- Parking availability and costs;
- Reason for the journey (work/shopping/recreation, etc);
- Frequency of service;
- Reliability;
- Integration with the transport network;
- Safety;
- Communication of the benefits and attributes of the service;
- Absence of real alternative; and
- Cost.

Not surprisingly, there is considerable overlap between those attributes considered important from the consumers' point of view and the factors identified by service providers as essential to a successful operation.

The issue of consumer satisfaction has been shown to have a great influence on consumer decision-making and is no less important in the context of travel. Any investigation into current and possible future travel decisions would therefore not be complete without an assessment of satisfaction levels.

This chapter has provided a background to the issues involved in travel behaviour and public transport from the Whangaparaoa Peninsula to downtown Auckland and the North Shore through a review of relevant literature. The method for

conducting the study into the travel preferences of the residents of the Whangaparaoa Peninsula is explained in the next chapter. It sets out the means of collecting and analysing information to help determine the possibility and likelihood of Whangaparaoa Peninsula residents patronising a ferry service to downtown Auckland and the North Shore and to assist in establishing factors likely to encourage the use of ferry travel.

Such research will assist those organisations involved in planning and providing ferry services to determine the future direction of ferry travel from the Whangaparaoa Peninsula, as part of the wider ferry strategy for Auckland.

CHAPTER THREE

METHODS

3.1 Introduction

This chapter sets out the methods employed for this research. It describes the aim of the research, the development and organisation of the sample, data sources and collection techniques, methods of analysis of that data and the limitations and assumptions relating to the sample and methodology.

3.2 Aim of research

The literature reviewed in the previous chapter revealed a need to investigate the travel preferences of residents of the Whangaparaoa Peninsula in order to establish the likelihood of them patronising a ferry service to downtown Auckland. This research is therefore based on the associated questions:

What are the travel preferences of residents of the Whangaparaoa Peninsula for journeys to central Auckland and North Shore City?

and

What factors are likely to lead the residents of the Whangaparaoa Peninsula to travel by ferry to central Auckland or North Shore City?

The following objectives have guided the research with the aim of providing answers to the two key research questions:

i) To determine the current travel behaviour of the residents of the Whangaparaoa Peninsula

ii) To determine the level of satisfaction of Whangaparaoa Peninsula residents with their current mode of travel to Downtown Auckland and to the North Shore City

iii) To determine how many residents are likely to travel by ferry

iv) To identify the main ferry service features desired by existing and potential passengers

v) To identify the preferred ferry terminal location or locations

vi) To determine the reasons why some choose not to travel by ferry

vii) To develop a model which explains the travel preferences and travel behaviour of the residents of the Whangaparaoa Peninsula.

Variables

In this study variables have been selected to determine the travel preferences of the residents of the Whangaparaoa Peninsula in relation both to travel to Downtown Auckland and travel to locations in the vicinity of Browns Bay in North Shore City. Variables have also been chosen to determine the reasons for those preferences. The choice of variables is grounded in the review of relevant literature pertaining to travel behaviour research, discussed in Chapter Two, in which recurring aspects of transport services and factors relating to the individual travel consumer were

identified that have been shown to influence the travel decision making process. The selected variables are discussed in section 3.5 below.

Preference data

An increasingly popular method for analysing travel behaviour is the use of preference data. Traditionally, revealed preference data were used, whereby observed preferences were recorded (Miller, 1993; Crouch & Louviere, 2001). The limitations of this approach are that such data contain information restricted to existing options and do not reveal the reasoning behind a particular choice. There is therefore increasing use of ***stated preference*** data for research that looks into what consumers "state" they will do rather than relying on what they have done (Crouch & Louviere, 2001). These data are used in many aspects of consumer research to construct models and to provide an indication of future consumer behaviour.

Theory supports the comparison of preference data between revealed and stated preferences for the same sample of consumers (Bernardino, Ben-Akiva & Salomon, 1993; Crouch & Louviere, 2001). The combination of revealed and stated preference data for the same sample is considered to improve external validity (Bernardino et al., 1993). It is therefore appropriate to gather information concerning both the forms of travel the sample population is using at present (revealed preferences) and what preferences they have for the future (stated preferences).

An in depth study using a carefully constructed stated preference experiment measuring individuals' perceptions of the attributes of proposed alternative travel modes would be worth investigating. Such an approach is outside the scope of this research but the preference data have been collected so as to provide a description of the travel desires of the target population together with an indication of the attributes they regard as important in a ferry service.

Decision-making models

Choice Modelling is a common methodology employed for analysing consumer choice based on the Random Utility Theory (Ben-Akiva & Lerman, 1985). Its relevance to the tourist sector has been endorsed (Crouch and Louviere, 2001) on the basis that tourists have a particularly complex purchasing process with many choices to be made in relation to one excursion. A discrete choice experiment is often used to assess the preferences of consumers in light of specified alternatives.

The construction of a choice model is not the aim of this research, which is a descriptive study designed to address specific research questions concerning travel preferences of the residents of the Whangaparaoa Peninsula, in particular in connection with ferry travel. However, such investigations may be possible at some later date using some of the data collected in this study as a starting point.

Descriptive approach

The *descriptive* approach is commonly employed in consumer behaviour research, whereby key information is sought relating to what actually happens, rather than the *normative* search for what should happen (East, 1990). It is therefore appropriate in this research into the behaviour of transport consumers to undertake scientific investigative research to describe the travel behaviour and stated preferences for travel of the target population.

Multimethod approach

A study which aimed to examine the relationship between service performance of public transport and overall cumulative satisfaction with service used a model with the "critical incident" technique (Friman & Garling, 2001, pg.853). Information was gained from surveys of public transport users and from public transport companies. It was noted at the end of the study that the measures used in that research did not reveal all of the specific attributes that are important to service performance.

As a result it was recommended that to obtain a more comprehensive measurement of satisfaction with public transport services, a multimethod approach should be adopted (Friman & Garling, 2001). This conclusion is typical of many studies that seek to assess consumer perceptions of a service (Bolton & Drew, 1991) and suggests that researchers be aware of the need in many cases for more than one approach.

The constraints of time and cost did not allow for a wide range of methods to collect data for this study. However, the methodology adopted for this research, based on the survey method, and consisting principally of a self-administered postal survey, was complemented by a smaller self-completion survey of ferry users. The strengths and weaknesses of these methods are outlined below as well as the actions taken in this study to allow for them.

3.3 Data source

The data required to answer the precise research questions being investigated in this study were not available from any pre-existing source. Various bodies such as commercial ferry operators and regional authorities have gathered data concerning aspects of travel behaviour and residents' attitude to travel options, in the Whangaparaoa region (R Cubed Ltd, 2000; Beca Carter Hollings & Ferner Ltd, 2000a; 2000b). These data are however, rapidly becoming out of date and, as is the case with most data collection, were collected for a specific purpose which varies from that for which data were sought in this study (Pratt, 2001). Although useful for comparison and to aid validation of the results of this research, they cannot be applied directly to answer these research questions.

As a consequence of this lack of existing data, a questionnaire was designed specifically to gather primary data to gauge the travel preferences and the existing travel behaviour of the residents of Whangaparaoa Peninsula. This main questionnaire was supplemented by a self-completion questionnaire designed for those who currently take the ferry, which was administered personally on board the ferry by the researcher. This combination of survey modes is appropriate to obtain a greater understanding of the preferences of those who do take the ferry and to give the study more depth (Zikmund, 2003).

Comparative data concerning the population was obtained from the national population census (Statistics New Zealand, 2001).

3.4 Data collection

The research is based on a survey of the residents of Whangaparaoa Peninsula concerning both their existing travel behaviour and their preferences for future travel from the peninsula in relation to ferry travel. It also includes a survey of those who currently patronise the Gulf Harbour commuter ferry service to Downtown Auckland seeking information about their travel behaviour and their preferences for hypothetical situations concerning ferry travel. This has elicited a combination of stated preference and revealed preference data (Louviere & Hensher, 2001) which is designed to provide a complete picture of the current and possible future travel behaviour of those surveyed.

3.5 Survey

3.5.1 Survey Design

The reasons for selecting the postal self-completion questionnaire as the main method of collecting primary data stem partly from the practicalities of time and budget (Sekaran, 1992; Zikmund, 2003). For larger scale studies, researchers are tending to employ computer aided telephone interview and internet survey techniques, both of which are outside the means of this exercise. A postal survey is a more cost-effective version of such methods and still enables the collection of a large amount of data in the time-frame available.

An equally important factor is that the survey is an appropriate tool for measuring and assessing consumer behaviour and travel preferences (De Vaus, 1991; Sekaran, 1992) and is widely accepted as a valid means of collecting data in the transport research field (Richardson & Wolf, 2001). It is regarded by researchers as the best way to collect extensive data from many respondents so that the information can be as representative as possible of the research population (Page & Meyer, 2000; Macky, 1998).

The self-administered postal survey has inherent strengths and weaknesses. One strength is the opportunity it leaves for the respondents to answer the questions in their own time. The responses are thus likely to be more thoroughly considered (Brog, 1985). It also avoids the influence of the personal attitude or behaviour of the interviewer on the interviewee's responses, which can occur in interactive data collection (Page & Meyer, 2000). Conversely, leaving a respondent to complete a questionnaire alone, without assistance from a researcher, can lead to misinterpretation of the questions being asked (Page & Meyer, 2000). It is therefore essential that the layout and wording of the questionnaire are both clear and unambiguous.

3.5.2 Content of questions

Much of the content of the questionnaire was based on the factors highlighted in the literature review in Chapter Two that have a bearing on modal choice and preferred service features. These include:

- Reason for journey
- Length of journey time
- Frequency of service
- Level of comfort
- Reliability
- Cost
- Integration with the transport network
- Absence of real alternative
- Safety
- Parking availability and cost

The variables concerning service features and attributes leading to the use or non-use of the *ferry* were developed from the travel literature reviewed in Chapter Two. The recent research into ferry travel conducted in Sydney by Daniels and Streeting (2002) provided a foundation for many questions. Examples are the questions about trip purpose, frequency of the trips, destination, and demographic information.

At recent workshops concerning travel behaviour research held in Australia, delegates from around the world noted that in terms of research methods, greater attention should be given to methods emanating from the fields of social and cognitive psychology (Louviere and Hensher, 2001). This conclusion is in line with the call to include *motivational* factors discussed earlier in Chapter Two (Steg et al., 2001). It suggests the inclusion of survey questions that not only ask "what" a respondent's current travel routine consists of, but also "why" that particular travel choice has been made. An opportunity for respondents to provide this information was therefore included in the two travel behaviour questionnaires.

Questions asking for the respondent's level of satisfaction with current modes of transport were designed to assist an assessment of the likelihood of switching to ferry travel from the existing travel mode. Satisfaction has been recognised as an important element in the decision to choose a particular form of transport, where an alternative is available (Natalisa & Subroto, 2003).

Inextricably linked to all answers is the destination of both commuter travel and other leisure or occasional work related travel. The destination determines the choice of available transport alternatives and trip time. Separate questions looked at travel behaviour relating to travel to central Auckland and to the North Shore, as these two locations are either existing or potential destinations for a ferry service.

A survey to determine the viability of a new ferry service has recently been carried out in the West Harbour region by a market research company commissioned by ARTNL (Gomez, 2003). In order for the results of this study to be of some practical assistance to ARTNL, where relevant, questions were asked using similar variables, such as the time slots for travel to Downtown Auckland and the age brackets in the demographic section. Seasonal travel can be an issue particularly with ferry travel (Graham & Russell, 2001), so this factor was covered in FQ2.

Style and wording of questions

Most of the questions were semi-structured (Taylor-Powell, 1998) so that the most common answers were printed in a list to be circled, with an option to add "other" alternative answers if nothing appropriate had been listed (see Appendices B and C for examples of the questionnaires). The benefit of this style of question is in keeping responses concise (Brog, 1985). Respondents were also given an option of "no opinion" in cases where their opinion was sought.

A five-point Likert scale (Page & Meyer, 2000; Pizam & Mansfeld, 2001) was employed for questions asking for levels of satisfaction or dissatisfaction with existing transport modes and where the likelihood of using certain ferry services

was questioned. Such a scale was chosen with a view to gauging the level of satisfaction of likelihood of ferry patronage rather than simply seeking a "yes/no" response. Respondents were allowed to take a neutral position in these questions and a balance was given between positive and negative responses (Taylor-Powell, 1998). A limited number of open-ended questions (Dillman, 1978; Taylor-Powell, 1998) gave the opportunity for respondents to provide a personal explanation for their travel preferences.

The importance of correct wording on the outcome and in particular on the validity of a survey was emphasised by Payne (1951) and repeated by many others (Taylor-Powell, 1998; Page & Meyer, 2000; Zikmund, 2003). Payne explained that words used in questions have a far greater influence on the data gathered than the sampling technique selected. In accordance with his advice, the wording of the questions remained simple and clear throughout. Care was taken to ensure that questions were specific, not biased and made no assumptions.

Questions were written so to ensure they were not time-consuming to answer and where mutually exclusive answers were not possible, respondents were given an opportunity to provide multiple responses (Taylor-Powell, 1998). The response categories for questions asking for times of departure or the length of a journey were set out in logical, even divisions.

3.5.3 Layout

The layout was straightforward with relatively simple and brief instructions. This aimed to avoid confusion and hence minimise item nonresponse (Brog, 1985; Redline & Dillman, 2000). Directions about how to answer were simple and included instructions in brackets immediately following the questions. Transitional statements, explaining what the next set of questions were about, were used to aid continuity (Taylor-Powell, 1998).

Questions were numbered consecutively running down the page with a reminder that more questions were overleaf. The same types of questions and responses were used throughout a series of questions on the same topic. The questionnaire was divided into sections moving from general travel behaviour questions to those covering specific destinations and finishing with standard demographic questions.

Many writers argue that self-completion questionnaires are more than just words (Taylor-Powell, 1998; Redline & Dillman, 2002). The numbers and symbols or signs used in such a questionnaire can also have an impact on the responses, both in terms of omissions and failures to follow instructions to branch to other questions (Redline & Dillman, 2002).

There is research to prove that there is a greater likelihood of items not being answered if a questionnaire includes branching questions, than if it does not and studies have sought to find out both why that is so, and how can this be reduced (Redline & Dillman, 2002). One conclusion is that the respondents must process all the "language" of navigation in addition to the verbal language and the quantity of information leads to errors. Experiments have been successful in reducing some errors by manipulating all these "languages" but the "perfect" model has not yet been produced (Redline & Dillman, 2002).

In light of the problem with branching questions these were kept to a minimum in this particular study. On four occasions only were respondents required to move directly to a question other than the consecutive question, if they gave a particular response.

3.5.4 Ethical issues

It is acknowledged that rights and obligations are attached to the parties participating in research of this kind (Zikmund, 2003). The research proposal was presented to the Massey University Human Ethics Committee (MUHEC), prior to

commencement of the study, on the basis that no ethical difficulties were anticipated (MUHEC, 2002). This study was then conducted following approval from MUHEC (see approval letter included in Appendix D).

At all times the objectivity of this research was maintained by working towards the collection of accurate data. Issues of privacy and anonymity were carefully considered and questionnaires did not bear the name of the respondent, nor were the respondents required to identify themselves. Assurances that the data would form part of a large data set, used only for aggregate results, were made in the covering letter sent with the questionnaires.

In the case of the smaller survey of ferry users, respondents were given the option of completing a separate sheet with contact details if they agreed to make themselves available for follow-up telephone interviewing. To avoid unintentional association of responses with the respondent, a separate collection box was available for the contact sheets. After analysis of the data collected from the ferry users the decision was made that, on the basis that sufficient valuable data had been gathered, no follow-up interview would be required. The details of those who had supplied contact information were therefore carefully destroyed.

3.5.5 Pilot Study

In order to test the suitability of the questionnaire a pilot study, or pretest, was conducted prior to the final form of the questionnaire being settled upon. The value of pretesting a questionnaire is stressed by many practitioners (Salant & Dillman, 1994; Taylor-Powell, 1998). It is seen as invaluable to ensure that individuals will be motivated to answer the questionnaire, any accidental researcher bias is avoided and the questions actually measure what they are intended to measure (Taylor-Powell, 1998).

It is particularly important to pre-test a self-reply questionnaire as respondents do not have the same opportunity as, for example, interviewees, to obtain explanations or assistance (Orams & Page, 2000). Contact details were included in the letters accompanying the questionnaires for that reason (see Appendices E, F, and G).

A draft questionnaire, together with explanatory letter (see Appendix E), was sent to 15 individuals, ranging from commuting and non-commuting residents of the Whangaparaoa Peninsula, to recently graduated PhD students, to senior transport planners and engineers at the Auckland Regional Council and Rodney District Council. Feedback was sought concerning the style and content of questions and the format of the questionnaire form as a whole. Written and verbal responses were collated and resulted in modifications to the layout and in some cases the content of the questions.

3.5.6 Response rates

It is widely acknowledged that surveys are a popular and historically valid research tool (Groves, Dillman, Eltinge & Little, 2002; Richardson & Wolf, 2001). Their popularity and widespread use over the last few decades may be at the root of the recent problem of survey *nonresponse*. The voluntary participation of survey subjects is crucial to the success of surveys, but it appears that "over surveying" of sample populations has led to increased reluctance to participate (Groves et al., 2002; Richardson & Wolf, 2001; Page & Meyer, 2000).

The issue of nonresponse has led to an examination of how nonresponse affects the ability to infer results to the target population. Attempts have also been made to improve the quality of statistical information by redefining the estimation process (Groves et al., 2002).

Particular difficulties arise in the area of nonresponse to postal surveys, as opposed to interviews, such as how to identify the reason for nonresponse (Moore & Tarnai,

2002). The effect of follow-ups on reducing non-response appears to indicate that many who do not respond forget to do so or are not particularly interested in doing so until asked again (Dillman, 1978; 1998).

Researchers have worked hard to improve response rates to postal surveys, with success, mainly through a number of survey design features (Dillman, 1978; 1998). Literature in this area cites as the most successful features personalising the mail, inclusion of a stamped addressed envelope, multiple follow-ups, incentives, and special postage, the latter three being the most effective factors (Brog, 1985: Macky, 1998; Dillman, 1998; Moore & Tarnai, 2002). The present study followed a number of these strategies to reduce nonresponse, namely stamped addressed envelopes, follow-ups and personalised mailings. Incentives were not used in order to minimise costs.

Despite efforts to reduce nonresponse, it remains a weakness of postal surveys, as in order to validate research it is necessary to understand the characteristics of non-respondents and therefore the potential bias inherent in a postal survey (Richardson & Wolf, 2001). Studies have attempted to determine the influence of demographics in addition to survey design factors on the response rate, without any particular success.

The studies carried out by Moore and Tarnai (2002) where nonrespondents were compared with respondents for two different postal surveys found that it is still not possible to estimate nonresponse error directly. They did however conclude that despite the possibility of distorting frame variables by trying to obtain higher response levels, it is desirable to include the later respondents in the data (Moore & Tarnai, 2002).

The approach taken in the design of this survey was therefore to include all responses; even those received much later after a follow-up mail-out.

3.5.7 Sample

Population

The population selected to form the basis of this study was the residents of the Whangaparaoa Peninsula north of Auckland. The total number of residents aged 20 years and above, recorded in the most recent population census of 2001, is **23,508** (Statistics New Zealand, 2001). The research relates to travel behaviour and travel preferences, therefore the section of the population likely to be in a position to make choices regarding travel mode, those that are post-secondary schooling, was the target population.

The sample was derived from the Electoral Roll and the licensed data base already obtained by the Department of Management and International Business of Massey University at Albany, contained the details of subjects aged 20 years or over at the time of the most recent election in 2001. Consequently the population base for this study was the residents of Whangaparaoa Peninsula now aged approximately 21 or over.

Random sample

From this population a random sample of 700 was generated using the Excel computer programme (Thompson, 1992). This number was selected on the basis that a sample of approximately 300 is a valid sample size for a sample population in the region of 18,000 (Cavana, Delahaye & Sekaran, 2001) and a response rate of 40%-45% was expected (Macky, 1998).

To ascertain whether this random sample appeared truly random and therefore likely to give a fair representation of the sample population, the frequencies of gender and geographic spread across the peninsula were compared with corresponding information available from the most recent population Census of 2001 (Statistics New Zealand, 2001). Chi-squared tests for statistical significance

were conducted to ascertain the Goodness of Fit of the sample. An alpha or p value of greater than 0.1 was considered a good fit (Page & Meyer, 2000).

This comparison revealed that as far as the sample was concerned the percentages of male and female subjects corresponded closely to equivalent gender proportions identified for this population, of residents aged over 20 years, in the 2001 Census. The proportions are set out in Table 3.1 below.

Table 3.5.1 Percentage of sample male and female populations

Gender	Sample % (())	Census 2001 % (E)
Male	47.71 (334)	48.17 (337.19)
Female	52.29 (366)	51.83 (362.81)
Base n:	*700*	*700*

A chi-squared Goodness of Fit test for gender showed an excellent fit (chi-square = 0.070, df = 1, p = > 0.10).

The catchments for the different areas within the Whangaparaoa Peninsula differed between the Census and the Electoral roll. Although the random sample was derived from the Electoral roll, details of the place of residence for the entire population of the Whangaparaoa Peninsula were not readily available, so it was not possible to achieve a direct comparison. Nevertheless, approximately the same equivalent proportions of subjects residing in different locations across the peninsula appeared in the sample as in the Census (Statistics New Zealand, 2001) as shown in Table 3.2 below.

A chi-squared Goodness of Fit test for place of residence did not show a good fit (chi-square = 10.7, df = 4, p= <0.1). This variance may well be as a result of the different divisions of areas.

Table 3.5.2 Percentage of sample population residing in each area of the Whangaparaoa Peninsula.

Area	Sample % (O)	Census 2001 % (E)
Red Beach	**23.43 (164)**	**25.07 (175.5)**
Stanmore Bay	**35.71 (250)**	**35.76 (250.3)**
Manly	**26.42 (184.9)**	**25.10 (175.7)**
Army Bay	**8.44 (59.1)**	**10.13 (70.9)**
Gulf Harbour	**6.00 (42.0)**	**3.94 (27.6)**
Base n:	***700***	***700***

Bearing in mind the difficulty of comparing the sample with the population information, it is not possible to conclude that the random sample of 700 residents to whom the questionnaires were mailed are truly representative of the population which forms the basis of this study. The greatest difference appears in the over representation of those living in the Gulf Harbour area.

At the analysis stage, once completed questionnaires had been examined, this exercise was repeated to determine whether those who responded and supplied data formed a representative sample of the population. The results of this comparison are noted in the following section.

3.6 Survey response

3.6.1 General questionnaire (TQ1)

Initial response

The initial mail out consisted of 700 questionnaires (TQ1) posted to the subjects identified in the random sampling process with a covering letter explaining the purpose of the study and confirming that participation was voluntary (see letter in

Appendix F). These questionnaires were numbered for identification. A stamped addressed envelope was included with the questionnaire.

After two weeks approximately 255 responses had been received. Of these, approximately 200 were properly completed questionnaires and 45 indicated that the addressee no longer resided at the given address. The remaining ten either declined to respond because they indicated they felt the survey had no relevance for them, or they requested payment before completing the questionnaire, or in one case the subject was deceased.

Follow-up

A follow-up letter (sample copy in Appendix G) was sent to all those from whom no response had been received, together with a replacement questionnaire and prepaid envelope. This amounted to approximately 445 follow-up mailings. At the end of two weeks a further 80 completed questionnaires were received and 26 more arrived over the course of the following fortnight. Approximately 35 more were returned as the addressee no longer resided at that address and three replied but declined to complete the survey as they explained they did not use public transport.

Total response rate

In all, 399 responses were received. Of these, 79 indicated the addressee no longer lived at the address to which the questionnaire had been sent, 11 declined to respond and one explained that the subject was deceased.

The total number of completed questionnaires, which form the basis of this study, is **308.**

As explained in section 3.5.7, assuming a response rate of approximately 40%-45%, and desiring a number of 300 valid responses, 700 individuals were selected as the sample to which questionnaires would be sent. A final response rate of 44% was achieved and more than the required 300 usable responses received.

Representation of population

The aim of using a random sample from which to collect data is to be able to generalise results to the entire sample population (Page & Meyer, 2000). To determine whether a truly representative selection of respondents had provided data, the geographic, age and gender spread of respondents was compared, where this was possible, with the corresponding population of the Whangaparaoa Peninsula identified in the 2001 Census (Statistics New Zealand, 2001). The Census information can be viewed in Appendix H.

This comparison (see Table 3.6.1) showed that the respondents came from a more representative geographic spread across the peninsula than the original sample and the basic spread of proportions corresponds between the two sets of percentages. A chi-squared Goodness of Fit test for place of residence showed a good fit (chi-square = 1.89, df= 2, p= > 0.1).

Table 3.6.1 Percentage of respondent population residing in each area of the Whangaparaoa Peninsula.

AREA	RESPONDENTS % (O)	CENSUS 2001 % (E)
Red Beach to Stanmore Bay	**57.8 (177)**	**60.8 (186)**
Arkles Bay/ Whangaparaoa to Tindalls Beach	**25.5 (78)**	**25.1 (76.8)**
Matakatia Bay to Army Bay/ Okoromai Bay	**16.7 (51)**	**14.1 (43.1)**
Base n:	***308***	***308***

The split between male and female respondents did not quite match the gender split of residents as set out in the Census information (refer Table 3.6.2). A chi-squared Goodness of Fit test for gender showed the fit was not good (chi-square = 6.383, df = 1, p = 0.012). A higher proportion of women responded than a true representation according to the 2001 Census would expect. This may be the result of more reluctance on the part of men to complete a questionnaire, as the sample did consist

of a representative split between men and women. A similar result was noted in the Project FaB public transport survey conducted for North Shore City (Booz-Allen & Hamilton, 2000a).

Table 3.6.2 Percentage of respondent male and female populations

Gender	Respondents % (O)	Census 2001 % (E)
Male	**44.6 (170)**	**48.17 (147.9)**
Female	**55.4 (137)**	**51.83 (159.1)**
Base n:	*308*	*308*

In respect of the age ranges, Table 3.6.3 shows there was a slight variance between the data set and the Census population. Only 21.5% of respondents came from the 60+ age bracket whereas the Census recorded a population of 30% for that age range residing on the peninsula. A chi-squared Goodness of Fit for age therefore did not show a good fit (chi-square = 26.09, df = 2, $p < 0.001$).

Table 3.6.3 Percentage of respondents' age groupings.

Age	Respondents % (O)	Census 2001 % (E)
20-39	**28.3 (84)**	**33.8 (100.4)**
40-59	**49.8 (148)**	**35.8 (106.3)**
60+	**21.9 (65)**	**30.4 (90.3)**
Base n:	*297*	*297*

The reason for the smaller percentage of results from the older age bracket may be that fewer of the respondents of that age felt inclined or able to complete the questionnaire. One of the weaknesses of the self-completion questionnaire is this inability to determine the reason for non-response (Moore & Tarnai, 2002).

A test for the significance level in relation to the two variables of "age" and the "likelihood of using a ferry from a location other than Gulf Harbour" revealed a Likelihood Ratio (Stopher & Meyburg, 1979) of **0.269**. Thus the null hypothesis cannot be rejected in relation to these variables. For this reason it was decided that any further efforts to collect data from more individuals in the "over 60" age bracket was not of any benefit to the research in terms of attempting to identify relationships between age and the likelihood of ferry patronage.

The Census asks those who are usually resident at that location and employed to state the main means of travel to work (Statistics New Zealand, 2001). Again, the Census options for answers do not mirror exactly those in related questions in TQ1. For example, the ferry is not given as a possible response in the Census questionnaire and must therefore come into the "other" category. However, a general comparison can be made to ascertain whether the respondents to TQ1 are representative of the general working population of the Whangaparaoa Peninsula, as set out in Table 3.64.

Table 3.6.4 Percentage of respondents' means of travel to work

Means of travel to work	**Respondents (O)** **%**	**Census (E)** **%**
Car, truck or van	**87.50 (91)**	**81.07 (84)**
Bus	**5.77 (6)**	**2.75 (3)**
Motor cycle	**0.96 (1)**	**0.60 (1)**
Bicycle	**0.0 (0)**	**0.39 (0)**
Other	**5.77 (6)**	**15.19 (16)**
Base n:	*104*	*104*

Note: Expected count has been rounded to achieve whole numbers.

A chi-square test for Goodness of Fit showed that the fit was not particularly good (chi-square = 9.83, df = 4, p = < 0.1). This result may be influenced by the difference in the original questioning and cannot be relied on as a true indication of

whether or not the respondents are representative of the sample frame in terms of means of travel to work. It is quite clear from the Census data, however, that travel by car, truck or van far outweighs the use of public transport or any other travel mode for journeys to work. This information is clearly reflected in the questionnaire responses.

3.6.2 Ferry questionnaire (FQ2)

Rationale

Analysis of the data collected from the postal questionnaires revealed some areas that required further investigation or clarification. Thus, additional data were sought to provide sufficient information to fully answer the research questions.

The postal questionnaire did not elicit responses from many current regular ferry users. This was to be expected as only a very limited service is operating at present and patronage is not very high. It was decided that specifically obtaining information from those who do presently use the service would complement similar data from those who do not. Questions covered their perception of the service and their attitude to possible changes in location of the terminal on the peninsula and stops at other terminals on the North Shore in addition to general travel behaviour.

One such need for clarification occurred where a large proportion of respondents (24.6%) had identified "*weather*" as the most important factor in their decision to travel by ferry (see Q. 43 of TQ1, Appendix B). It was not clear whether this meant that the respondent was concerned with the impact of weather from the point of view of reliability of service, or comfort, or indeed saw it as a positive factor.

A series of face to face interviews with a random selection of current ferry users was considered as a means of obtaining an explanation for this response. The infrequency of the service and thus the time and cost required to obtain data from a number of ferry users led to the decision to design a questionnaire (FQ2) to be

handed to ferry users for completion during the crossing. The advantages of a personally administered questionnaire are the opportunity to clarify any queries and to motivate the respondent (Cavana et al., 2001). A high response rate is also possible.

Response rate

In this instance, a total of twenty-seven questionnaires (FQ2) were administered. The ferry operator confirmed that commonly patrons number between 25 and 30 and those who responded were among the regular passengers. Thus a good response rate was achieved that was close to a census of the population of ferry users.

The first attempt to administer these questionnaires on the 7.10am sailing from Gulf Harbour on a Tuesday morning in August 2003 was not completely successful as the ferry was cancelled due to rough seas. The replacement coach service took over and the researcher boarded the coach before its departure.

After a brief explanation of the background to and aim of the study, questionnaires were handed out to twelve individuals who indicated they would be willing to complete them and return them in the prepaid envelopes supplied. Eight completed questionnaires were duly received via mail.

A second attempt to administer the questionnaire on the following Thursday proved more successful. A further fifteen questionnaires were handed out to passengers aboard the 7.10am sailing to downtown Auckland. These were completed during the journey and collected by means of a reply box left at the front of the main cabin, prior to arrival at the downtown wharf. The four individuals, who had received questionnaires on board the coach two days earlier but had not returned them by mail, handed the completed forms in to the reply box on the ferry.

Only two passengers onboard the ferry during the Thursday trip declined to complete a questionnaire. One did so because she explained she was on holiday for a short time and was not resident on Whangaparaoa Peninsula, thus felt it was not relevant to her. The other passenger said he was too tired and did not wish to take a form away for completion later.

No further attempts were made to administer the survey on the grounds that the number of respondents was very close to the maximum number of regular ferry patrons, and the passengers themselves indicated that they constituted the core of those patrons.

3.7 Data analysis

The analysis focussed on describing and understanding configurations (King & Woodside, 2001) of travel-related phenomena as well as looking at the impact of changes in independent variables to explain variance in the dependent variables of travel mode. Consequently both the qualitative comparative and analysis of variance paradigms were employed.

3.7.1 Quantitative

General questionnaire
The information gathered from the 308 questionnaires was post-coded where a number of similar responses were made to open ended questions. An example was the common response to the questions regarding the reason for slow travel times being *traffic jams*. Following recoding and cleaning (Macky, 1998) the data was entered into a format to enable analysis using the Statistical Package for the Social Sciences (SPSS) programme.

Frequencies were obtained for 117 variables and bivariate hypothesis testing was carried out on a range of variables. As all variables for which data were collected were either nominal or ordinal, crosstabs (or the chi-squared tests of association) (Page & Meyer, 2000; Cavana et al., 2001) were used to investigate the relationship between pairs of discrete variables. A significance level (p-value) of 0.05 was chosen and it was necessary in some cases to recode variables where the expected frequencies were low. This was achieved by combining variables such as "likely" and "very likely" into one value so that the p-value would be reliable.

Where the p-value was equivocal, the Likelihood Ratio (Stopher & Meyburg, 1979) was employed too. In other cases just the Pearson chi-square test was used. This test is not reliable for a sample size greater than 300 as it always tends to reject the null hypothesis of no association (Page & Meyer, 2000). In this case, no individual responses that were analysed in this way numbered more than 300, so the tests were sound.

Ferry questionnaire

Quantitative data collected from ferry users by means of a questionnaire were also examined for frequencies using the SPSS package. Although the data set was much smaller than that derived from the larger questionnaire it provided useful comparison where corresponding questions were answered. The number of responses was very close to the whole population of ferry users, thus it can be assumed that these data provided a fair representation of the behaviour and preferences of those users.

3.7.1 Qualitative

Content analysis was carried out on the answers given to open-ended questions contained in both questionnaires. In some cases individuals had added written comments on the back of the sheets and in the case of the ferry users, some had offered verbal comments to the researcher, which were noted down. This qualitative information was analysed alongside the data specifically requested.

Common themes (Page & Meyer, 2000; Zikmund, 2003) amongst the responses were identified. Where possible, these were coded and variables were entered into the SPSS programme for analysis together with the quantitative responses. Most qualitative information was recorded from the ferry users through the FQ2 form and the results are reported in the following chapter.

3.8 Data validation

3.8.1 Comparison

One use that survey results are often subjected to is comparison with other similar surveys to provide a wider picture of an issue or to see if the data collected in a particular study correlates to that collected for another. It is important that any researcher is aware that survey data is rarely completely comparable even if care is taken to phrase questions in a similar way (Pratt, 2001).

Different survey methods can produce differing results. Whether the survey was by telephone as opposed to a postal survey, whether it was carried out at the same time of year, whether non-response rates compare, are all factors that can influence the data (Pratt, 2001).

Transport behaviour surveys occur regularly as local authorities seek approval for transportation plans and policies and as private operators seek market research feedback for commercial purposes (Brog, 1985; Booz-Allen & Hamilton, 2000a). In many cases these surveys relate to specific locations or time periods so that they cannot be directly compared. Notwithstanding the caution that must be exercised when looking at other surveys, some researchers are finding benefits in terms of cost-efficiency and time by "piggy-backing" their studies on to other related data (Pratt, 2001).

This was not done in this case as very specific questions were asked requiring the collection of primary data designed to achieve the research objectives outlined at

the outset of this chapter. However, models were constructed and data were collected for Rodney District Council over the period 1997 to 2000 from broadly the same sample population through a combination of methods. Some similar questions were asked concerning travel behaviour and attitudes towards transport issues on the peninsula (Beca et al., 2000a; R Cubed, 2000).

One report shows traffic flows from the peninsula which, although not directly comparable in terms of measurement, appears to indicate trips being made to different destinations from the peninsula in similar proportions to those stated by residents in their responses to TQ1 (Beca et al., 2000b). Concerns with traffic congestion and the need to improve public transport services came through in a survey mainly of residents of the Whangaparaoa Peninsula (R Cubed, 2000), which echo many of the responses to similar questions in TQ1. A consideration of these reports is useful in so far as it allows a certain level of validation of the responses obtained to TQ1.

3.9 Limitations

The determination to ensure true anonymity for respondents to the general postal questionnaire (TQ1) meant that an opportunity to ask respondents who were so willing, to provide contact details for a possible follow-up telephone interview with the completed questionnaire, was not exploited. More detailed discussions of this kind may have elicited richer data concerning reasons for certain travel preferences. Nevertheless, a substantial amount of useful data was gathered and a number of respondents provided unsolicited qualitative information, written onto the questionnaire forms, concerning their travel behaviour and attitudes to various modes of travel.

The under-representation of the 60+ age group in the responses to TQ1 has been explained in paragraph 3.6.1. This age group is less likely to use regular

commuting services, therefore their opinions are less relevant to this research. As a result of this under-representation it is fair to describe the sample obtained as representative of the commuting residents of the Whangaparaoa Peninsula.

In section 3.6.1 mention was also made of the fact that no significant difference was exhibited between the random sample and the sample frame in respect of gender, but the final sample was comprised of fewer male respondents than expected. The sample is therefore not representative of the population in regard to gender.

The difficulty of making a direct comparison between the areas within which the respondents, sample and original population live, as a result of three different divisions between localities, has prevented the administering of an accurate test for goodness-of-fit. The results of statistical tests conducted using the best approximation of similar locations possible showed a significant difference between the random sample and the population in regard to place of residence.

The same test showed that a significant difference did not exist for the respondents and the fit was good. The geographic spread of respondents was therefore representative of the entire population of the Whangaparaoa Peninsula.

Similar difficulties in obtaining a fair comparison were encountered when attempting to compare the Census 2001 means of travel to work data with the responses to TQ1. As stated in section 3.6.1, a good fit was not found using the chi-square Goodness of Fit test, but this may well be due to the difference in questioning. The Census data is useful as an indication of similar travel patterns, rather than for validating the reliability of the data collected in this study.

The present study was primarily a descriptive study designed to establish the existing travel behaviour of, in particular, the commuting residents of the Whangaparaoa Peninsula. It also sought to gauge the general preferences of all

residents for travel to central Auckland and the North Shore with a focus on their feelings towards ferry travel. This study forms a good foundation therefore for further detailed research into travel preferences of this population.

The validity problems associated with constructing a model purely from stated preference data, where constraints are not highlighted and there is the possibility of imperfect descriptions of alternatives, are understood (Louviere & Hensher, 2001). Nevertheless the particular research questions can be addressed using the data obtained through the methods described in this chapter, and a qualified conclusion reached, bearing in mind the possibility of respondents in some cases not making a fully informed response.

A more in-depth stated preference study (Polak & Jones, 1997) could explore more complex hypothetical scenarios for respondents to consider, particularly if a new ferry service is likely. A more specific approach such as this would be a useful tool for assessing the likely response of potential users to any new or modified service (Polak & Jones, 1997). The under-representation of male respondents could be addressed in a future study.

3.10 Summary

The variables identified in the consumer and travel behaviour literature reviewed in Chapter Two formed the basis for questions designed to elicit responses to reach the research objectives discussed at the beginning of this chapter concerning travel behaviour and travel preferences of the residents of the Whangaparaoa Peninsula. This chapter has explained in detail how and from whom data were collected, then analysed, to achieve those research objectives. The extensive results of that analysis are set out in the following chapter.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the results obtained from an analysis of the data collected from the two questionnaires discussed in Chapter Three (TQ1 and FQ2). Key aspects of residents' travel behaviour are identified which may have implications for new or improved ferry services. The ferry service features desired by current and potential ferry users are highlighted, together with the attitude of respondents to alternative terminal locations and services to or via Browns Bay. Note that any reference to "central Auckland" in these results refers both to the central business district (CBD) and to the area within a radius of 5 kilometres from the CBD.

Descriptive statistics provide a clear view of the travel preferences of residents of the Whangaparaoa Peninsula and significant relationships between some variables are identified using chi-square bivariate analysis. Most of the quantitative data results are displayed in tabular or chart form, qualitative data is discussed and examples of individual opinions are quoted.

The results are arranged under the following seven headings:

- Work patterns and travel behaviour of residents of the Whangaparaoa Peninsula
- Non-commuting travel to central Auckland
- Non-commuting travel to the North Shore
- Work patterns and travel behaviour of ferry users
- Preferred Features of Ferry Service
- Terminal Location
- Reasons for not using the ferry

4.2 Work patterns and travel behaviour of residents of the Whangaparaoa Peninsula

Information regarding those who do not travel by the Gulf Harbour ferry was obtained from the TQ1 sent out to a random sample of residents of the Whangaparaoa Peninsula. Travel behaviour to the North Shore and to central Auckland was investigated through a series of questions covering frequency, mode, reasons for and destination of travel and levels of satisfaction with that travel. Stated preferences concerning ferry travel were also obtained.

4.2.1 Work/study patterns of Whangaparaoa Peninsula residents

Residents were asked about their regular week day activities. Table 4.2.1 shows that just over half work full-time (51.7%) with a further 15.9% working part-time. Another 5% either study full time or work and study part-time. Approximately 15.9% are retired and most of the remainder are engaged in home duties (15.9%) or are unemployed (1%).

Table 4.2.1 Regular day-time week day activities

Regular week day activities	%
Work full time	51.7
Work part time	15.9
Study full / part time	5.3
Retired	15.9
Home duties	7.9
Unemployment	1.0
Other	2.3

Base n: 302

4.2.2 Usual destination for work/study commuters

The Whangaparaoa Peninsula residents who work/study were asked to what destination they commute.

Destinations are geographically quite dispersed, with the highest proportion travelling to the North Shore (27.3%). As Table 4.2.2 shows, 19.3% travel to central Auckland or within 5kms of the CBD. A further 17.6% work or study between Red Beach and Warkworth, 15.9% stay on the Peninsula and the remaining 19.8% are spread across the greater Auckland region ranging from Manukau to Henderson.

Table 4.2.2 Work/study destinations for commuters

Work / study destination	%
Auckland central	12.3
Within 5km of Auckland central	7.0
North Shore	27.3
Red Beach – Warkworth	17.6
Whangaparaoa Peninsula	15.9
Other	19.8

Base n: 227

4.2.3 Mode of transport to work/study

For those who commute to central Auckland or to the North Shore for work or study by far the majority travel by car (84%). As shown in Table 4.2.3, the express bus (6.7%) and regular bus (4.2%) services are the next popular modes of transport to both destinations, followed by the ferry (2.5%) for those who are travelling to central Auckland only. The other modes of transport identified (2.6%) are motorcycle and van.

Table 4.2.3 Mode of transport to work or study

Mode of Transport	Total %	Central Auckland %	North Shore %
Car	84.0	70.0	94.1
Express Bus	6.7	1.6	-
Non Express Bus	4.2	6.0	2.9
Ferry	2.5	6.0	-
Other	2.6	2.0	3.0
Base n:	*119*	*50*	*68*

4.2.4 Frequency of travel to central Auckland and to the North Shore

As would be expected for a study of commuters, over 59% of those travelling to central Auckland or the North Shore make that trip five times a week. In Table 4.2.4 it can be seen that as far as the commuters to central Auckland are concerned a further 13.6% make that journey three times a week and 11.4% do so four times a week. The table also shows that approximately half that proportion (6.8%) travel for work or study twice week and the same percentage do so six times a week.

A similar pattern emerges for commuter trips to the North Shore, as 12.8% travel three times a week and 7.6% of commuters make the trip two days a week and six days a week respectively.

Table 4.2.4 Frequency of commuting to central Auckland and the North Shore

Frequency	Central Auckland %	North Shore %
Less than once a week	-	3.0
Once a week	2.3	1.5
Twice a week	6.8	7.6
Three times a week	13.6	12.1
Four times a week	11.4	6.1
Five times a week	59.1	59.1
Six times a week	6.8	7.6
More than six times a week	-	3.0
Base n:	*44*	*66*

Mean frequency: 4.5 days a week

4.2.5 Time of travel to central Auckland and to the North Shore

Almost one third of commuters (32.6%) travelling to central Auckland leave home before 6.30am. Another sizeable group (28%) departs for the place of work or study between 6.30am and 7.30am. Perhaps a reflection of avoidance of peak hour traffic, fewer leave home for the city between 7.30am and 8.30am (11.6%) than after 8.30am (23.3%).

Not surprisingly, a slightly different pattern is evident for those commuting to the North Shore. The majority set off between 7.00am and 8.00am (46.8%) with reasonably large numbers travelling either side of those times (14.1% between 6.30am and 7.00am and 12.5% between 8.00am and 8.30am). Not as many travelling to the North Shore left their departure as late as those commuting to the city (14.1% set off after 8.30am).

The Pearson chi-square test of association showed that the relationship between time of departure for work or study and the location of that work or study was of some significance (chi-square = 31.349, df = 20, p-value = 0.051, note that a p-value of <0.05 is considered significant in this study). An alternative test for significance, the Likelihood Ratio test of association, was, however, less convincing (Likelihood Ratio = 27.701, df = 20, p-value = 0.117). A larger sample size may have shown up a stronger relationship than was found in this case.

Table 4.2.5 Time of travel to work or study

Time of leaving home	**Total %**	**In / near central Auckland**	**North Shore**
Before 6.00am	8.3	16.3	3.1
6.00 – 6.29am	10.2	16.3	6.3
6.30 – 6.59am	13.9	14.0	14.1
7.00 – 7.29am	19.4	14.0	23.4
7.30 – 7.59am	17.6	9.3	23.4
8.00 – 8.29am	9.3	2.3	12.5
8.30 – 8.59am	8.3	7.0	9.4
9.00 – 10.00am	5.6	11.6	1.6
After 10.00am	3.7	4.7	3.1
Various / other	3.7	4.6	3.1
Base n:	*108*	*44*	*64*

4.2.6 Length of journey to central Auckland

There is quite a variance in the time taken by commuters for the trip to central Auckland, ranging between 21-30 minutes (4.8%) to over an hour (19%). Most journeys appear to take between 31–50 minutes (52.4%), although 21.4% have recorded a journey time of between 51 and 60 minutes. This variance appears to be related to the time of travel, with most of the journeys taking over an hour commencing between 7.00am and 7.29am. The short journey time of 21-30 minutes relates to journeys undertaken after 10.00am.

4.2.7 Length of journey to the North Shore

Table 4.2.6 shows that by far the majority of commuter trips to the North Shore take 21-30 minutes (43.9%). A fair number take between 31 and 40 minutes (25.8%) and 16.7% of those travelling to the North Shore to study or work make the trip in less than 20 minutes. Those who arrive in under 20 minutes leave at anywhere between before 6.00am to after 10.00am. Most of those who take 21-30 minutes for the journey leave between 7.00am and 8.30am, although there is also quite a spread of departure times for a journey of this length.

As might be expected, the Pearson chi-square test showed there is a clear association between the time of travel and the length of journey time (chi-square = 48.645, df = 12, p-value = 0.001).

Table 4.2.6 Length of journey to work/ study in central Auckland and the North Shore

Journey length	Central Auckland %	North Shore %
Less than 20 mins	-	16.7
21 – 30 mins	4.8	43.9
31 – 40 mins	26.2	25.8
41 – 50 mins	26.2	9.1
51 – 60 mins	21.4	4.5
More than an hour	19.0	-
Others	2.4	-
Base n:	*42*	*66*

4.2.8 Principal cause of delay

Approximately 90% of commuters indicated that they experience delays in their regular travel to work or study. The most commonly cited reason for such delay, set out in Table 4.2.7, was traffic congestion (74.7%) followed by Whangaparaoa Road being blocked (14.3%) and also accidents (7.7%). A further 3.3% gave a variety of other reasons, often related to the most common responses, such as inadequate roading infrastructure.

Table 4.2.7 Cause of delay for commuters

Cause of delay	%
Traffic congestion	74.7
Whangaparaoa Road blocked	14.3
Accidents	7.7
Other	3.3
Base n:	*217*

4.2.9 Car use of commuters

As Table 4.2.8 displays, a slightly higher percentage of the commuters who travel by car stated they usually need to use their car during the day (41.3%) than those who stated they do not (33.7%). The remaining 25% indicated they sometimes need to use their car. Those working or studying on the North Shore (45.5%) needed to use their car during the day more than those travelling to central Auckland (33.3%).

Table 4.2.8 Need for car during working day

Need to use car	Total %	Central Auckland %	North Shore %
Yes	41.3	33.3	45.5
No	33.7	33.3	33.3
Sometimes	25.0	33.4	21.2
Base n:	*103*	*37*	*66*

In most cases commuters travelled alone (82.3%). There were two regular occupants in 11.8% of cases and 5.9% of commuters regularly took two passengers, to give a total of three occupants. It is seen in Table 4.2.9 that the percentage driving alone was slightly higher for those travelling to Auckland (88.6%) as opposed to those driving to the North Shore (80.0%).

Table 4.2.9 Number of occupants in commuting car

No. of occupants	Total %	Central Auckland %	North Shore %
1	82.3	88.6	80.0
2	11.8	5.7	13.8
3	5.9	5.7	6.2

Base n: 102

For those commuting by car, Table 4.2.10 shows that the majority does not pay for parking (92.2%). A few pay between $2.00 and $5.00 (2.9%), and for the small number of remaining commuters who do pay, parking costs range widely from $2.00 to more than $15.00. It is perhaps to be expected that a higher proportion of those commuting to central Auckland pay for parking (17.1%) than those travelling to the North Shore for work or study (3%) and the parking costs in town tend to be higher.

Table 4.2.10 Parking costs for commuters

Parking cost	Total %	Central Auckland %	North Shore %
Nothing	**92.2**	82.9	97.0
Less than $2.00	1.0	-	1.5
$2.00 - $5.00	2.9	5.7	1.5
$5.01 - $10.00	1.9	5.7	-
$10.01 - $12.00	1.0	2.9	-
More than $15.00	1.0	2.9	-
Base n	*103*	*36*	*67*

4.2.10 Satisfaction of commuters with current mode of travel

Bearing in mind that 84% of commuters travel by car, it is interesting to note that 60.5% of those making the journey into or near central Auckland are satisfied or very satisfied with their current mode of travel. An examination of Table 4.2.11 reveals that even more of those travelling to the North Shore (76.9%) express a high level of satisfaction. Over a quarter of the commuters to or near to central Auckland (27.9%) indicated they are neither satisfied nor dissatisfied whereas only 7.7% of those commuting to the North Shore gave a similar response.

The Pearson chi-square test for association showed that the association between the location of the work or study and satisfaction with the current mode of travel to that location is clearly significant (chi-square = 22.145, df = 10, p-value = 0.014).

Table 4.2.11 Satisfaction of commuters with current mode of transport

Level of satisfaction with current travel mode	In / near central Auckland	North Shore
Very dissatisfied	7.0	3.1
Dissatisfied	4.7	9.2
Neither satisfied nor dissatisfied	27.9	7.7
Satisfied	55.8	49.2
Very satisfied	4.7	27.7
No opinions	-	3.1
Base n:	*43*	*65*

4.2.11 Reasons for level of satisfaction

Commuters were given the opportunity to state why they experienced a certain level of satisfaction or dissatisfaction with their regular mode of travel in an open-ended question. The reasons most commonly given were:

Satisfaction

i) No alternative (27.7%)

ii) Flexibility/independence (23.4%)

iii) Convenience (19.1%)

Dissatisfaction

Journey takes too long (10.6%)

Neither satisfied nor dissatisfied

No alternative (17%)

(percentages are of all those who gave a reason for their level of satisfaction: *n=47*).

4.2.12 Demographics of non-ferry commuters

The majority of commuters (57.9%) are in the 40-59 years age bracket and in the case of those who travel to the North Shore for work or study, are more likely to be female (52.9%), whereas those travelling to central Auckland are predominantly male (61.4%). Of those commuting to central Auckland 27.8% earn between $30,000 and $59,000 and then the next most popular band is over $120,000. For those travelling to the North Shore there is a more even spread between $30,000 and $90,000.

Commuters who do not travel by ferry live along the length of the peninsula. A higher proportion of those commuting to the North Shore come from the Red Beach to Stanmore Bay location (see map in Appendix A). Those working or studying in the city are evenly split between those living west of Stanmore Bay and those residing from Arkles Bay out to the tip of the peninsula.

4.3 Non-commuting travel to central Auckland

4.3.1 Frequency of non-commuting travel to central Auckland

Table 4.3.1 shows that most respondents (84.4%) stated that they travel to or near to central Auckland for reasons other than regular study or work. Of those, 45.2% make that journey between one and five times a month whilst 26.9% travel to Auckland less than once a month.

Those who travel to Auckland more than 10 times a month are most likely to be male aged between 40 and 59 years. On the other hand, those who make that trip less than once a month or never are more likely to be female, although the age spread for that response is fairly even.

Table 4.3.1 Frequency of non-commuting trips to central Auckland by gender and age.

No. of trips per month	Total %	Female %	Male %	20-39 yrs %	40-49yrs %	60+ yrs %
More than 10	4.3	2.4	6.8	2.4	5.6	3.2
5-10	9.0	5.4	13.5	10.7	9.7	3.2
1-5	4.5	44.9	45.1	45.2	43.1	4.7
Less than 1	26.9	31.7	21.1	22.6	29.2	28.6
Never	14.6	15.6	13.5	19.0	11.8	17.5
Base n:	*301*	*167*	*133*	*84*	*144*	*63*

4.3.2 Reasons for non-commuting travel to Auckland by mode of travel

Respondents were asked to indicate why they travel to Auckland other than for work or study. They were invited to give more than one reason.

The results displayed in Table 4.3.2 show that the most common response was to visit friends or relatives (45.1%) closely followed by going out to movies, restaurants, etc (43.1%) and shopping (42.0%). The other reasons for such trips included sports and work related activities.

The usual form of transport for such trips was the car (96.9%) with a small number of journeys by bus (2.3%) and even fewer by taxi (0.4%) or other means (0.4%).

Table 4.3.2 Reason for trip to central Auckland by transport mode

Reason	Total %	Mode of transport			
		Car	Bus	Taxi	Other
Visiting friends/relatives	45.1	25.2	25.0	100.0	-
Going out – movies, restaurants etc	43.1	23.3	25.0	-	-
Shopping	42.0	23.6	25.0	-	-
Work related	26.4	14.1	25.0	-	100.0
Sports	1.1	6.2	-	-	-
Other	1.3	7.5	-	-	-
Base n:	*257*	*453*	*8*	*1*	*1*

Note columns do not always add up to 100% because of multiple responses or rounding.

4.3.3 Timing and length of non-commuting trips to central Auckland

Most who travel to central Auckland for reasons other than work or study usually do so both on weekdays and at the weekend (45.1%). For a further 31.9% this sort of travel usually occurs at the weekend, with the remaining 23% travelling most often during the week.

The length of that journey, displayed in Table 4.3.3, is usually between 31 and 40 minutes (43.1%) with only 6.3% finding the journey usually takes more than 50 minutes and 20% making the trip in less than half an hour.

The journeys to central Auckland outside of work or study usually take place mid-morning (34.4%) both on weekdays and at the weekend, with a reasonable number in the early afternoon (19.5%). As might be expected, these non-commuting journeys are more likely to occur later in the afternoon and evening at weekends than during the week.

Table 4.3.3 Length of non-commuting journey to central Auckland

Journey length	Central Auckland %
Less than 20 mins	-
21 – 30 mins	20.0
31 – 40 mins	43.1
41 – 50 mins	30.6
51 – 60 mins	3.6
More than an hour	2.7

Base n: 255

4.3.4 Principal causes of delay

Three-quarters of respondents noted they experienced delays in their non-commuting travel to central Auckland. Table 4.3.4 sets out the reasons given by respondents for delays. Traffic congestion was the reason most often cited (85.3%), with lesser mention of accidents and Whangaparaoa Road being blocked.

Table 4.3.4 Cause of delay for non-commuting trips to central Auckland

Cause of delay	%
Traffic congestion	85.3
Whangaparaoa Road blocked	3.9
Accidents	8.7
Other	2.1

Base n: 231

4.3.5 Satisfaction with mode of non-commuting travel to central Auckland

From the results displayed in table 4.3.5 just over two-thirds (68.4%) of those who travel to central Auckland for reasons other than work or study are satisfied or very satisfied with their current mode of transport. Only 15% are dissatisfied or very dissatisfied and those remaining either have no opinion or are neither satisfied nor dissatisfied.

Table 4.3.5 Level of satisfaction with non-commuting travel mode to central Auckland

Level of satisfaction with current travel mode	Total %	Mode of transport			
		Car	Express Bus	Non Express Bus	Ferry
Very dissatisfied	5.9	5.3	12.5	-	-
Dissatisfied	9.1	3.9	12.5	25.0	-
Neither satisfied or dissatisfied	15.0	14.5	12.5	50.0	-
Satisfied	50.6	56.6	37.5	25.0	100.0
Very satisfied	17.8	18.4	25.0	-	-
No opinion	1.6	1.3	-	-	-
Base n:	*253*	*76*	*8*	*4*	*1*

As with the commuters, for non-commuting trips to central Auckland respondents were given the opportunity to state why they experienced a certain level of satisfaction or dissatisfaction with their regular mode of travel in an open-ended question.

The reasons most commonly given were:

Satisfaction

i) Convenience (36.1%)

ii) Flexibility/independence (26.1%)

iii) No alternative (9.2%)

Dissatisfaction

i) Journey takes too long (11.8%)

ii) No alternative (0.8%)

Neither satisfied nor dissatisfied

No alternative (10.9%)

Other/No opinion (5%)

(percentages are of all those who gave a reason for their level of satisfaction, *n=119*).

4.4 Non-commuting travel to the North Shore

Details of non-commuting travel to the North Shore have been set out in a similar fashion to the corresponding information for non-commuting travel to central Auckland. These results have been presented separately so that the information gathered in relation to each destination for non-commuters can be considered independently.

4.4.1 Frequency of non-commuting travel to the North Shore

Nearly half (47%) of respondents travel to the North Shore for reasons other than regular study or work between one and five times a month, and a further 38.7% do so more than five times a month. Only 14% travel to the North Shore less than once a month or never.

Those who travel to the North Shore more than 10 times a month are most likely to be female aged between 20 and 39 years. On the other hand, there is an even spread of men and women of a variety of ages who make that trip less than once a month or never.

Table 4.4.1 Frequency of non-commuting trips to the North Shore by gender and age

No. of trips per month	Total %	Female %	Male %	20-39 yrs %	40-59 yrs %	60+ yrs %
More than 10	12.0	10.8	13.5	19.3	9.0	6.3
5-10	26.7	29.5	22.6	26.5	30.6	17.5
1-5	**47.0**	**45.8**	**48.9**	**41.0**	**45.8**	**58.7**
Less than 1	11.0	10.2	12.0	9.6	12.5	11.1
Never	3.3	3.6	3.0	3.6	2.1	6.3
Base n:	*300*	*166*	*133*	*83*	*144*	*63*

4.4.2 Reasons for non-commuting travel to the North Shore by mode of travel

Respondents were asked to give the reasons they travelled to the North Shore other than for work or study. The most common response shown in Table 4.4.2 was "shopping" (37.1%) followed by "visiting friends and relatives" (25.6%) and "going out to movies, restaurants, etc" (15%). The other reasons for such trips included sports and work related activities.

Table 4.4.2 Reasons for non-commuting travel to the North Shore by transport mode

Reason	Total	Mode of transport		
	%	Car	Bus	Other
Shopping	37.1	37.0	60.0	-
Visiting friends / relatives	25.6	25.4	40.0	-
Going out – movies etc	15.0	15.1	-	-
Work related	9.5	9.7	-	-
Sports	7.5	7.6	-	-
Other	5.3	5.2	-	100.0
Base n:	*628*	*617*	*5*	*1*

The usual form of transport for such trips was the car (98.1%) with a small number of journeys by bus (0.8%).

4.4.3 Timing and length of non-commuting travel to the North Shore

For most who travel to the North Shore for reasons other than work or study they usually do so both on weekdays and at the weekend (54.2%). For a further 24.4% this sort of travel usually occurs at the weekend, with the remaining 17.7% travelling most often just during the week.

The length of that journey, displayed in Table 4.4.3, is usually between 21 and 30 minutes (54.6%) with only 0.3% finding the journey usually takes more than 50 minutes and 15.4% making the trip in less than 20 minutes.

Table 4.4.3 Length of non-commuting journey to the North Shore

Journey length	North Shore %
Less than 20 mins	15.4
21 – 30 mins	54.6
31 – 40 mins	11.8
41 – 50 mins	5.1
51 – 60 mins	2.7
More than an hour	0.3

Base n: 293

The journeys to the North Shore outside of work or study usually take place mid-morning (32.2%) both on weekdays and at the weekend. A reasonable number of non-commuting trips are also made in the early afternoon (20.9%). A much smaller proportion occur before 9.30am (8.3%) or after 8.00pm (5.3%). As might be expected, the later afternoon and evening journeys are more frequent at weekends than during the week.

4.4.4 Principal causes of delay

For non-commuters who are able travel out of peak times, three-quarters of respondents still recorded delays in their travel. In Table 4.4.4 it can be seen that once again by far the most common cause identified was traffic congestion, with some mention of accidents and Whangaparaoa Road being blocked.

Table 4.4.4 Cause of delay for non-commuting trips to the North Shore

Cause of delay	%
Traffic congestion	83.1
Accidents	8.7
Whangaparaoa Road blocked	7.8
Other	0.4

Base n: 231

4.4.5 Satisfaction with mode of non-commuting travel to the North Shore

Nearly three-quarters (73.6%) of those who travel to the North Shore for reasons other than work or study are satisfied or very satisfied with their current mode of transport, as set out in Table 4.4.5. Only 13.4% are dissatisfied or very dissatisfied and the remaining respondents either have no opinion or are neither satisfied nor dissatisfied.

Table 4.4.5 Level of satisfaction with non-commuting travel mode to the North Shore

Level of satisfaction with current travel mode	Total %	Mode of transport		
		Car	Bus	Other
Very dissatisfied	5.8	6.0	-	-
Dissatisfied	7.6	7.0	25.0	-
Neither satisfied nor dissatisfied	11.7	11.6	50.0	-
Satisfied	50.9	51.4	25.0	100.0
Very satisfied	22.7	22.5	-	-
No opinion	1.4	1.4	-	-
Base n:	*291*	*284*	*4*	*1*

Respondents were given the opportunity to state why they experienced a certain level of satisfaction or dissatisfaction with their non-commuting mode of travel to the North Shore in an open-ended question.

The reasons most commonly given were:

Satisfaction

i) Convenience (37.9%)

ii) Flexibility/independence (32.3%)

iii) No alternative (11.3%)

Dissatisfaction

i) Journey takes too long (9.7%)

ii) No alternative (1.6%)

Neither satisfied nor dissatisfied

No alternative (5.6%)

Other/No opinion (1.6%)

(percentages are of all those who gave a reason for their level of satisfaction, *n=124*).

4.5 Ferry Users

The data collected from the FQ2 (Appendix C) provided a clear picture of the travel behaviour of the majority of ferry patrons. It also indicated their attitude to both the current and possible alternative future services. The number of regular patrons is small, ranging between 25 and 30 according to the operator Kawau Kat.

A fair sample size of 27 responses was obtained, but such a small number of responses does not allow meaningful bivariate analysis to take place, to test significant relationships between variables. The most useful approach was therefore descriptive analysis to identify frequencies of responses.

4.5.1 Details of regular ferry travel

Of the twenty seven respondents, all but one take the ferry to travel to work and the remaining respondent travels to their place of study by ferry. Most travel four times a week or more (85.2%), three (11.1%) take the ferry one to three times a week and one (3.7%) travels by ferry once a fortnight.

The destination once leaving the ferry for the majority, 23 of the ferry users, is central Auckland, a further three are travelling to within 5 kms of central Auckland and one specified Newmarket as the destination. It is not surprising therefore that when questioned, 81% walk from the ferry to their destination, while the remaining respondents take the bus.

The most common means of arriving at the Gulf Harbour ferry departure point is by driving one's own car (63%), 29.6% are dropped off, whilst one respondent walks and one cycles.

4.5.2 Impact of weather

Weather was cited by a number of non-ferry users in the TQ1 as a factor influencing the decision whether to travel by ferry or not. It was not clear from those responses how weather influenced that decision. To ascertain what impact weather has on those who travel by ferry this question was asked specifically in the FQ2.

The researcher observed, when collecting data from ferry users, that a luxury style coach is provided to transport passengers to the city when conditions are deemed too rough to operate the ferry service. There is no evidence that non-ferry users are aware of this back-up service, which most ferry users indicated they are very satisfied with. The responses recorded in Table 4.5.1 indicate that the weather had either no or limited impact on ferry travel for most passengers (74.1%).

Table 4.5.1 Impact of weather on ferry travel

Impact	**%**
None	63.0
Limited	11.1
Negative	7.4
Other	18.5

Base n: 27

The *other* impacts of weather noted by respondents are:

a) That the cost for travelling in the replacement coach is the same as the ferry, whereas the Stagecoach bus, which can be caught without having to drive to Gulf Harbour, is $5.00 cheaper;

b) that it is more pleasant to catch the ferry in poor weather, such as rain, than to sit in the traffic for an extra half an hour;

c) that in one case the respondent is not comfortable travelling by ferry when the sea is rough, even if the ferry is still running and therefore closely studies the weather the night before;

d) that the respondent sometimes catches a bus to avoid a rough sailing.

Non-regular users of the ferry were asked to nominate what factor might lead to more regular ferry use (Q.17). From a choice of twelve options, 16.7% chose "weather" as the relevant factor.

When questioned as to whether any respondents used the ferry only in certain seasons (Q.7), they all replied in the negative.

Impact of traffic congestion

In the TQ1 many respondents noted a concern with traffic congestion leading from the Whangaparaoa Peninsula to the North Shore and central Auckland. This matter was further investigated in the FQ2 through a question asking directly what impact traffic congestion has on the choice to travel by ferry (FQ2, Q.8). The results presented in Table 4.5.2 indicate the great impact of traffic congestion on the decision by most ferry users to take the ferry:

Table 4.5.2 Impact of traffic congestion on decision to travel by ferry

Impact	**%**
Great	85.2
Little	3.7
None	7.4
Other	3.7

Base n: 27

Some respondents noted that they would drive to work if it were not for the congestion. Another indicative comment in response to the question about the impact of the traffic congestion was:

"Huge – I won't sit in traffic jams when I can relax on the ferry".

4.5.3 Level of satisfaction and general comments

The general level of satisfaction with the ferry service amongst current users is represented in Table 4.5.3. Almost eighty-nine per cent of respondents (88.9%) were satisfied or very satisfied and only one respondent (3.7%) expressed dissatisfaction with the service.

Table 4.5.3 Level of satisfaction with ferry service

Level of satisfaction with ferry travel	%
Dissatisfied	3.7
Neither satisfied nor dissatisfied	7.4
Very satisfied	51.9
Satisfied	37.0

Base n: 27

A range of observations were made in response to an open ended question inviting an explanation for the level of satisfaction with the current service and any other comments about ferry travel. The most common themes amongst the responses are:

Positive

- *Great crew, friendly and professional*
- *Reliable service*
- *An extremely relaxing and "stress free" way to travel*
- *Good amenities*
- *Camaraderie and social aspect*
- *Enjoy the drinks and barbecue on Friday nights*
- *Appreciate the ability to work or study during the journey*

Negative

- *Journey time is too long and boat too slow*
- *Need a later morning sailing*
- *Need a bigger boat to cope with rougher seas*

4.5.4 Non-ferry travel to central Auckland and the North Shore

Ferry users were asked about their travel by modes other than the ferry to central Auckland and the North Shore. These questions (Qs. 23-36) reflect similar questions asked in the TQ1.

Auckland

The frequency of non-ferry travel to central Auckland presented in Table 4.5.4 showed 44.4% made such a journey more than five times every month and 48.1% one to five times. These trips tend to be made both at the weekend and on weekdays, as shown in Table 4.5.5.

Table 4.5.4 Frequency of non-ferry travel to central Auckland

Number of trips per month	%
More than 10	29.6
5 – 10	14.8
1 – 5	48.1
Never	7.4
Total	100.0

Base n: 27

Table 4.5.5 Days of non-ferry travel to central Auckland

Days of travel	%
Weekday	20.0
Weekend	32.0
Both	48.0
Total	100.0

Base n: 25

The most common reasons for the non-ferry trips were:

- Work related
- Visiting friends or relatives
- Shopping
- Movies/restaurants

The most common mode of non-ferry transport was by car (92 %) with just two respondents (8%) travelling by bus.

The level of satisfaction with this form of transport was relatively high, with 64% of respondents stating they were either satisfied or very satisfied and just 12% claiming to be dissatisfied or very dissatisfied as Table 4.5.6 demonstrates.

Table 4.5.6 Satisfaction with non-ferry travel to central Auckland

Level of satisfaction	%
Very dissatisfied	4.0
Dissatisfied	8.0
Neither satisfied nor dissatisfied	16.0
Satisfied	40.0
Very satisfied	24.0
No opinion	1.4

Base n: 25

The reasons given for this satisfaction with mainly car travel included the flexibility, convenience and cost effectiveness of car travel for more than one person. It was also noted that the car was a better option than the bus in terms of convenience.

Those who travel by bus indicated dissatisfaction and noted that all forms of public transport in Auckland are "*very poor*". Others who expressed dissatisfaction cited the traffic congestion as the reason.

North Shore

The frequency of non-ferry travel to the North Shore displayed in Table 4.5.7 showed 18.5% made such a journey more than five times every month, whilst 63% did so one to five times and 18.5% made the journey less than once a month or never. Once again, Table 4.5.8 demonstrates that most respondents travel to the North shore other than by ferry both on weekdays and at the weekend.

Table 4.5.7 Frequency of non-ferry travel to the North Shore

Number of trips per month	%
More than 10	11.1
5 – 10	7.4
1 – 5	63.0
Less than one	14.8
Never	3.7

Base n: 27

Table 4.5.8 Days of non-ferry travel to the North Shore

Days of travel	%
Weekday	3.8
Weekend	19.3
Both	76.9

Base n: 26

The most common reasons for the non-ferry trips were:

- Shopping
- Visiting friends or relatives
- Movies/restaurants

All non-ferry travel to the North Shore was by car. The level of satisfaction with this form of transport was high, with 72% of respondents stating they were either satisfied or very satisfied and just one respondent (4%) claiming to be dissatisfied.

The reasons given for this satisfaction with car travel to the North Shore included:

- Convenience
- No need to rely on public transport
- Car travel/ traffic at weekends is no problem
- Flexibility
- Cost-effectiveness for more than one person
- Acceptance it is necessary if live in Gulf Harbour

The explanation given by the dissatisfied respondent was that that individual "*hates cars*".

4.5.5 Demographics

The demographics of the ferry users show that 59.3% are female, and 40.7% are male. All but one respondent are in full time employment and the remaining ferry patron is a tertiary student. One respondent gave her ethnic group as Asian and the remainder as New Zealanders of European descent.

The age range of ferry users indicates that most are in the **40-59** year old bracket (55.5%) whilst 37% are under 39 years and two respondents (7.4%) are over 60 years old.

Ferry users resided at addresses between Manly and Army Bay. None lived further west along the peninsula than Manly (see map in Appendix A)

4.6 Terminal Location

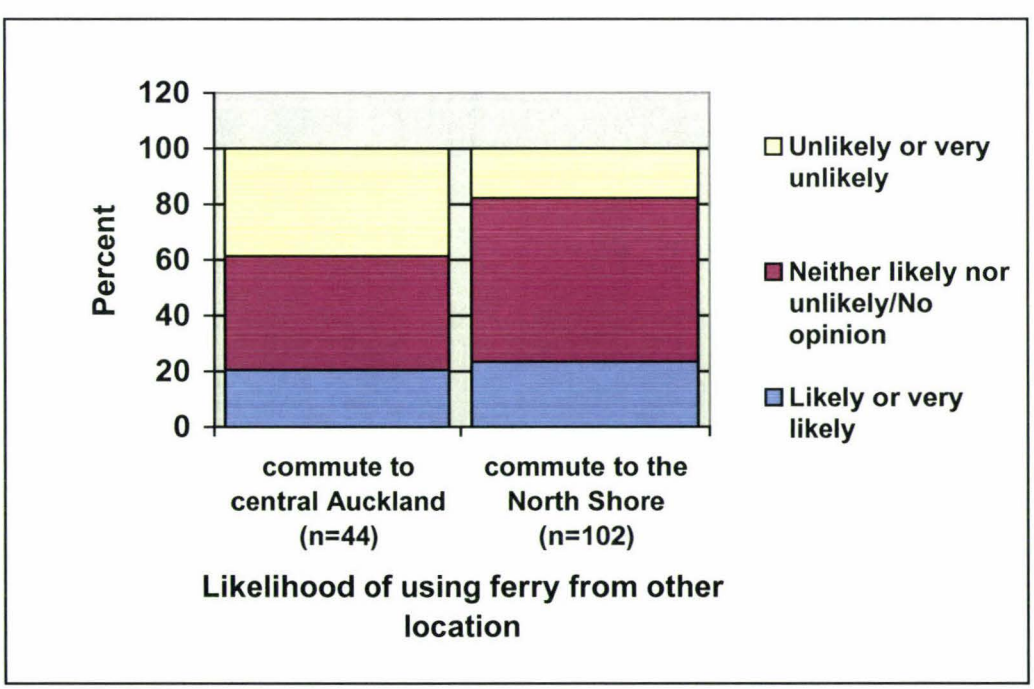
4.6.1 Non-ferry users

Likelihood of using terminal other than Gulf Harbour

In TQ1, commuters who do not regularly patronise the ferry from Gulf Harbour (use it less than once a month or never) were asked how likely they would be to use the ferry, even occasionally, if it departed from another location. The majority indicated they were neither likely nor unlikely to use the ferry or had no opinion (58.5%). There was quite an even response between those who thought it likely or very likely they would use a ferry from another location (20.3%) and those who thought it unlikely or very unlikely (21.3%).

The responses by commuting destination are displayed in Figure 4.6.1 below:

Figure 4.6.1 Likelihood of commuters using ferry from a location other than Gulf Harbour by commuting destination



When the variable of the destination for work or study of commuters was tested against the likelihood of using a ferry from a location other than Gulf Harbour using the Pearson chi-square test for association, a significant relationship was found (chi-square = 13.19, df = 4, p-value = 0.01). Commuters to central Auckland indicated that 38.6% of them would be unlikely or very unlikely to patronise a ferry from another location, whereas only 17.6% of those travelling to the North Shore for work or study had the same response.

Preferred terminal location

As for the preferred location of the ferry terminal, analysing responses for all residents of the peninsula, more respondents chose **Arkles Bay** (44.3%) than any other. Gulf Harbour was the next most popular choice (32.1%) and other suggestions (5.2%) included Little Manly and Weiti River.

Looking at those who commute to work or study, the result was similar, with 45.5% of those commuting to central Auckland preferring **Arkles Bay** and 47.1% who commute to the North Shore sharing that opinion. Gulf Harbour was the next best choice, preferred by 38.6% of Auckland city commuters and 30.4% heading to the North Shore to work or study.

The Pearson chi-square test of association was carried out to identify any significant relationship between the preferred terminal location and the likelihood of Whangaparaoa Peninsula residents using a ferry from a location other than Gulf Harbour. The result showed that, as might be expected, a significant relationship does exist (chi-square = 19.83, df = 6, p-value = 0.003).

As Table 4.6.1 shows, it is interesting to note that 19.4% of those stating they would be likely or very likely to use a ferry from a location **other** than Gulf Harbour, still selected Gulf Harbour as their preferred ferry terminal. Arkles Bay came out the clear favourite for respondents.

Table 4.6.1 Likelihood of using ferry from location other than Gulf Harbour by preferred terminal location (TQ1).

Preferred ferry terminal location	Likelihood of using ferry from location other than Gulf Harbour		
	Likely / very likely %	Unlikely / very unlikely %	Neither likely/ unlikely or no opinion %
Gulf Harbour	19.4	30.2	36.2
Arkles Bay	62.9	49.2	36.7
Other	9.7	3.2	4.5
No opinion	8.1	17.5	22.6
Base n:	*62*	*63*	*177*

4.6.2 Ferry users

Ferry users were asked which would be their preferred ferry terminal location from a choice of Gulf Harbour, Arkles Bay or another location they could specify. As might have been expected, the majority of current ferry users are happy with the present location of the ferry terminal at Gulf Harbour (77.8%). A further 18.5% stated that Arkles Bay would be their preferred location and one respondent (3.7%) suggested Little Manly.

The likelihood of current ferry users patronising a service from a location other than the present terminal at Gulf Harbour was tested (Q.10). There was a very even spread of responses with 44.4%, stating they would be likely or very likely to use the ferry from a different location, the same percentage (44.4%) would be unlikely or very unlikely to do so and 11.1% indicated they would be neither likely nor unlikely to use a different ferry terminal (see Table 4.6.2).

Table 4.6.2 Likelihood of using ferry from location other than Gulf Harbour (FQ2).

Likelihood	%
Likely / very likely	44.4
Unlikely / very unlikely	44.4
Neither likely nor unlikely	11.1

Base n: 27

4.7 Features of ferry service

Various questions were asked concerning the features of a ferry service that are likely to influence the decision whether or not to patronise such a service.

4.7.1 Service to or via Browns Bay

Non-ferry users

In TQ1 all respondents were asked to indicate the likelihood of using a ferry service even occasionally if it travelled to downtown Auckland via a North Shore terminal such as Browns Bay. Almost half (49.2%) stated they would be unlikely or very unlikely to use such a service, although 37.3% indicated they would be likely or very likely to do so.

Results were very similar when respondents were asked if they would be likely to patronise a service to go to a North Shore destination such as Browns Bay.

No significant relationship was found between the place to which respondents commute (either central Auckland or the North Shore) and their likelihood of using a ferry service to a terminal such as Browns Bay. In the case of those travelling to

the North Shore for work or study, almost double the number of those who indicated they *would* be likely to use such a service had the opposite opinion.

Ferry users

Ferry users were also posed the same two hypothetical questions. They considered the likelihood of using a ferry service, even occasionally, to Downtown Auckland via a North Shore terminal such as Browns Bay (Q.12) and the likelihood of using a ferry service to a location on the North Shore such as Browns Bay (Q.13). As Table 4.7.1 shows, the majority did think it likely they would use this service.

Table 4.7.1 Likelihood of using ferry service via Browns Bay.

Likelihood	**Ferry users %**	**Non ferry users %**
Likely or very likely	70.4	37.3
Neither likely nor unlikely	7.4	9.5
Unlikely or very unlikely	18.5	49.2
No opinion	3.7	3.9
Base n:	*27*	*305*

NB It is important to note that four respondents made the point that they would only patronise a service via Browns Bay if the total travel time to downtown Auckland did not increase. Concerns with such a service are exemplified in comments such as:

"It needs its own service as it would take too long and the weather can be too rough there"

"Only if a larger and faster ferry is used"

"It would be no good if it made the journey one and a half hours"

Table 4.7.2 shows that there is a slight majority amongst ferry users who think it unlikely they would patronise a ferry service to Browns Bay although just over 40% think it likely. The comment was made by one respondent that such a service would only be used for recreational purposes.

Table 4.7.2 Likelihood of using a ferry service *to* Browns Bay

Likelihood	Ferry users %	Non ferry users %
Likely or very likely	40.7	34.0
Neither likely nor unlikely	11.1	10.1
Unlikely or very unlikely	48.1	52.9
Base n:	*27*	*308*

Note: percentages may not total 100% due to rounding

4.7.2 Factors leading to ferry use

The general questionnaire TQ1 asked residents of the Whangaparaoa Peninsula what factors would lead them to use the ferry, on the assumption that very few currently did use the service. Twelve options were suggested with a further "other" category for individuals to complete if desired. Initially (Q.42) respondents were invited to select as many factors as desired. In the following question the single most important factor had to be specified.

Table 4.7.3 shows that frequency of service (60.7%) and price (59.4%) were considered important factors for the majority followed by reliability, terminal parking and stopping at other North Shore terminals en route for downtown Auckland.

Table: 4.7.3 Factors leading to ferry use for non-ferry users

Factor	%
Onboard facilities	20.5
Frequency of service	60.7
Reliability	38.6
Travel time	27.6
Weather	14.0
Stopping at other North Shore terminals	32.1
Fare integrated with other transport	28.9
Parking at terminal	36.0
Transport to and from terminal	23.7
Price	59.4
Location of terminal	27.9
Terminal facilities	6.2
Other	14.0
None	7.5

Base n: 308

Note : Percentages do not total 100 due to multiple responses.

When asked to state the single most important factor leading to ferry use, a very similar picture emerged, with frequency of service and price being by far the most popular responses, although travel time, became more significant than parking at the terminal.

Analysis of the responses from commuters showed, not surprisingly, that those travelling to the North Shore were more interested in stops at terminals on the North Shore and more concerned about the location of the terminal than those commuting to central Auckland. A higher proportion of North Shore commuters also stated that no factors would lead them to use a ferry whereas city commuters showed slightly more interest in the integration of ferry fares with other transport services and parking at the terminal.

The Pearson chi-square statistical test of association showed a significant relationship does exist between the most important reason leading to use of a ferry service and the destination of commuters for their study or work (chi-square = 47.897, df = 24, p-value = 0.003).

Table: 4.7.4 Single most important factor leading to ferry use (TQ1)

Factor	Total %	Commuting / Destination	
		Central Auckland %	North Shore %
Onboard facilities	3.8	-	6.4
Frequency of service	26.2	27.5	20.2
Reliability	4.5	2.5	2.1
Price	24.8	27.5	30.9
Travel time	4.5	5.0	2.1
Stopping at North Shore terminal	8.3	2.5	10.6
Integrated fare package	3.8	7.5	3.2
Parking at terminal	2.8	10.0	1.1
Transport to and from terminal	2.8	5.0	4.3
Location of terminal	3.8	-	6.4
Weather	2.4	-	2.1
Other	4.1	10.0	1.1
None	8.3	2.5	9.6
Base n:	*290*	*40*	*94*

Ferry users

The questions that were asked of the ferry users concerning the factors that *had led* them to choose the ferry, were similar in the main to those in TQ1discussed above. They also included the possible suggested answer of "avoidance of traffic", which was included as a result of an analysis of the answers to open ended questions in TQ1 relating to travel delays. Twelve different aspects of ferry travel were suggested as possible reasons for using the ferry service. In the first instance, respondents were given the opportunity to select as many responses as they wished and specify any other factor they considered important. The same options were repeated in a subsequent question asking for the *single* most important factor to be stated.

Analysis of the results shows responses that differ from those given by non-ferry users: in the general question, *avoidance of traffic* was seen as the most common reason for using the ferry (88.9%), followed by *reliability* and *travel time* (both 51.9%). The other two common responses were *onboard facilities* (40.7%) and *terminal parking* (37 %).

Table 4.7.5 demonstrates that the *single* most important factor identified by ferry users leading them to use the ferry is *avoidance of traffic.* In this question, where only one response could be given, the other factors were positioned slightly differently from the question allowing multiple responses. *Travel time* came ahead of *onboard facilities,* followed by *reliability* and *location of terminal. Terminal parking* did not feature as the most important factor.

The *other* considerations that were given as the main reason for choosing to travel by ferry were:

" Lack of access to car park in town";

" able to study while travelling";

"in other words, 2 hours per day not wasted sitting in traffic".

Table: 4.7.5 Single most important factor leading to ferry use (FQ2)

Factor	%
Onboard facilities	7.4
Reliability	3.7
Travel time	11.1
Avoidance of traffic	66.7
Location of terminal	3.7
Other	7.4

Base n: 27

4.7.3 Onboard services

Respondents were asked to nominate as many responses as they desired, from a selection of seven onboard services they like to see on a ferry. The questions were asked in exactly the same way in TQ1 as in the ferry users questionnaire, FQ2 and the services that were selected are displayed in Table 4.7.6 below.

Many comments were made regarding the need for more comfortable seating with good back support and adequate leg room. It is interesting to note that comfortable seats were a priority for both current and potential ferry users, whereas those presently using the service, noted the importance to them of newspapers and good food and beverages.

For ferry users, the *other* services suggested by respondents were:

- "Happy hour" once a week
- Noise and vibration reduction
- Tables with leg room

Table 4.7.6 Onboard services

Service	Non ferry Users %	Ferry Users %
Free carriage of bicycle	8.4	18.5
Comfortable seats	54.2	44.4
Children's area	11.7	3.7
Fax service	1.0	-
Computer work stations	3.9	14.8
Newspapers	14.0	48.1
Quality food and beverage	25.6	44.4
Other	7.1	11.1
None	21.1	3.7
Base n:	*308*	*27*

4.7.4 Frequency of service

Those who do not use the ferry cited the *frequency* of the Gulf Harbour ferry service was cited as a significant in their travel decision-making. The FQ2 therefore contained a question relating to service frequency, which at present consists of one weekday commuter service from Gulf Harbour to downtown Auckland departing at 7.10am and returning from downtown Auckland at 5.35pm. The weekend service runs very occasionally during the winter season leaving on Saturdays and Sundays at 9.00am from Gulf Harbour, returning from downtown Auckland at 4.30pm.

The respondents' opinion of the frequency of the current ferry service is recorded in Table 4.7.7 below and clearly indicates that most consider it to be insufficient.

Table 4.7.7 Ferry users' opinion of frequency of current service

Opinion	%
Good	18.5
Just adequate	3.7
Inadequate	66.6
Other	11.1

Base n: 27

Many respondents commented on the lack of flexibility afforded by the limited service. Some of the most common suggestions and opinions are reflected in the following quotes:

"A 3.00pm return trip would help part-time workers"

"I would use it more if there were later return boats"

"A later boat on Friday evening is a good idea"

"A mid-week shopper service in the summer would work well and at the weekends to bring people into the area for recreation"

"More frequent ferries are needed if the service is ever to become popular"

"The current service has no tourist value"

"Two services each way at peak times are needed"

"I would like it to leave a little earlier in the morning"

Of those who are not regular users of the Gulf Harbour ferry service (22.2% of respondents), when asked what would lead them to use the service regularly (Q.17), 83.3% replied "improved *frequency* of the service".

4.7.6 Price

Non-ferry users

In TQ1 respondents were asked to indicate the highest price they would be willing to pay for a daily return ticket to downtown Auckland. A range of prices was suggested along with a chance to specify an amount under $20.00. Table 4.7.8 demonstrates that for those who commute to central Auckland the most popular price was $10.00 (45.5%). For those travelling regularly to the North Shore for work or study, there was a relatively even split between those preferring a price of $10.00 (24.5%) and those happy to pay between $20.00 and $24.00 (23.5%).

Table 4.7.8 Preferred highest return fare to downtown Auckland by commuting destination (TQ1)

Ferry price	Commuting Destination	
	Central Auckland	North Shore
$35 - $40	-	1.0
$25 - $30	4.5	3.9
$20 - $24	13.6	23.5
Less than $20	20.4	27.5
$15	11.4	10.8
$10	45.5	24.5
No opinion	4.5	12.7
Base n:	*44*	*102*

Ferry users

Ferry users were asked to express their opinion as to the current price of the ferry service (Q.19). A single trip costs $12.00 and a 10-trip concession card can be purchased for $99.00. A 40-trip and one month concession is also available. Table 4.7.9 shows that the majority of ferry users find the fare either inexpensive or a fair price. Just over 25% find it expensive and *other* comments were to the effect that the respondent knows people who catch the bus because it is cheaper and that although the service is expensive it would be good value if integrated with other services.

Comments were made by a number of respondents concerning the need for integration of the ferry fare with other public transport services. It was suggested this would encourage day-trippers to the service.

There was some variation in comments relating the costs of car travel to the price of the ferry. Some noted that the fare was expensive but just balanced the cost of running a car and suggested this should be the basis for the price. Others said that the ferry equates with the costs of the car and parking, whereas one respondent found the ferry cheaper than vehicle expenses.

Table 4.7.9 Ferry users' opinion of price of current service

Opinion	**%**
Expensive	25.9
Fair	48.1
Inexpensive	18.5
Other	7.4

Base n: 27

4.8 Reasons for not using the ferry

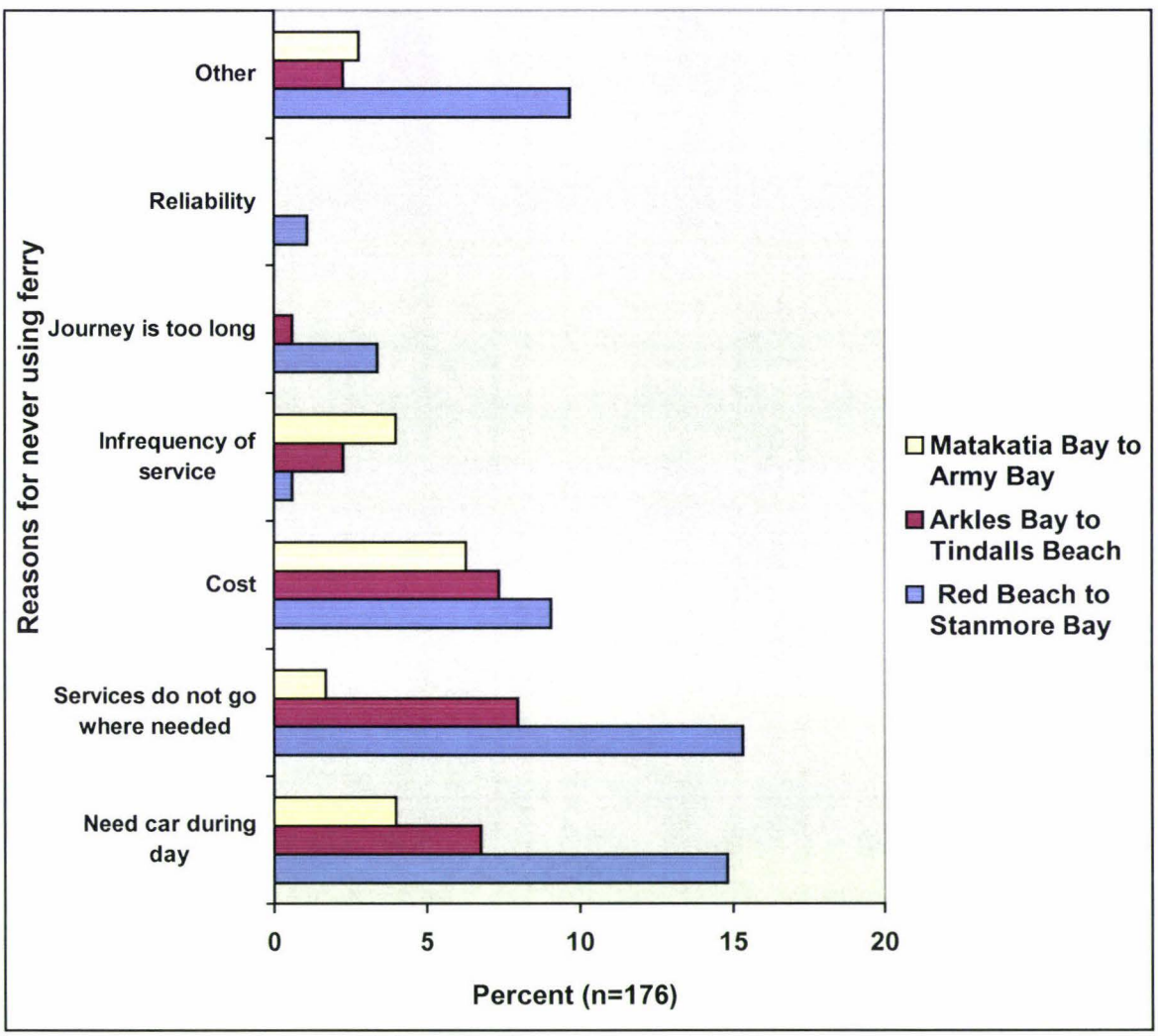
Those who feel they would never use a ferry service from the Whangaparaoa Peninsula to downtown Auckland were given the opportunity in TQ1 to state their reasons for that opinion.

Of the 308 respondents, 58.1% answered this question, which gave some set options to choose from and an "other" answer where they could specify a particular reason. Three main reasons were selected: needing a car during the day (25.7%), the services do not go where the respondent needs to go (24.6%) and cost (23.5%). The infrequency of the service was mentioned in 14.5% of cases, in the "other" category.

As might be expected, using the Pearson chi-square test for association, a significant relationship was identified between the reasons for not using the ferry service and the location on the Peninsula of the respondents' residence (chi-square = 29.527, df = 12, p-value = 0.003).

Figure 4.8.1 demonstrates that many more respondents living at the western end of the peninsula, from Red Beach to Stanmore Bay, felt they would never use the ferry service. The primary reasons they gave were the fact the services do not go where needed and the need to use the car during the day.

Figure 4.8.1 Reasons for never using the ferry service by place of residence



Some respondents noted that they felt they knew very little about the ferry service and it was not well publicised.

4.9 Summary

The results set out in this chapter provide a comprehensive picture of the travel patterns of both those who do and those who do not use the ferry service from the Whangaparaoa Peninsula to downtown Auckland. They also give an indication of levels of satisfaction with current travel modes and the factors that might lead non-users to patronise a ferry service and reasons why current patrons take the ferry. The results concentrated on commuters, as they are most likely to patronise a ferry service on a regular basis.

These results are discussed in more detail in the following chapter. Their relevance and relationship to the research presented in the literature reviewed in Chapter Two is considered, together with a deliberation over how this information has enabled the objectives set out in Chapter Three to be achieved.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The analysis of the data gathered from the two questionnaires, set out in the previous chapter, has yielded a valuable insight into the current travel behaviour and preferences of the residents of the Whangaparaoa Peninsula in respect of travel to central Auckland and to the North Shore. The level of satisfaction of both ferry users and non-ferry users with their current travel mode has been established and those factors relating to the ferry service that impact on the choice to travel by ferry have been prioritised by respondents.

This chapter now investigates further how this information can help determine what factors are likely to lead the residents of Whangaparaoa Peninsula to travel by ferry to downtown Auckland and to the North Shore. It also uses the results of the survey to develop a model for travel decision-making by the residents of the Whangaparaoa Peninsula based on the travel-buying behaviour model of Mathieson and Wall (1982) discussed in Chapter Two (p. 16, Fig. 2.3.2).

5.2 Implications of current travel behaviour and preferences for a ferry service

5.2.1 Non-ferry users

Commuting to central Auckland and to the North Shore

Almost three quarters of the residents of the Whangaparaoa Peninsula work or study full or part time. This means that many are travelling regularly to their place of work or study.

A little under one half of those who commute travel to central Auckland or to the North Shore. This equates to approximately one third of the population of the Whangaparaoa Peninsula over the age of 20 years or one third of 23,508 (Statistics New Zealand, 2001). Over 75% make that journey four times a week or more. This commuting population would be the obvious first target market for an improved ferry service; in particular, those heading regularly to downtown Auckland, as the infrastructure for this service already exists.

By far the majority of commuters travel by car, a fact which reflects commuting trends worldwide (O'Fallon, 1997; Burghouwt, 2002). In comparison, the express and regular bus services do not carry a large proportion of these regular travellers. This would seem to imply that it is car use rather than the use of alternative modes of public transport, which poses the greatest competition and challenge to attempts to encourage ferry patronage. This point will be explored further when the levels of satisfaction with existing travel modes are discussed. However, much international research reinforces the view that the promotion of one form of public transport and subsequent increases in patronage of that transport mode, often arises from a switch from other modes of public transport rather than decreased car use (Brog, 1993; White, 2002).

In order to attract commuters successfully away from cars a combination of strategies is recommended (Ortuzar et al., 1997; Burghouwt, 2002). These focus not only on the promotion of public transport options, such as the ferry, but also on parking control and car-free zones in central cities (Pharaoh & Apel, 1995). Few of those commuting by car in this study, particularly travelling to the North Shore, pay for parking. It is not possible from the information collected in this research, to determine whether it is this lack of parking costs that contributes to the choice of car as travel mode. Extensive international research (Miller, 1993; Pharaoh & Apel, 1995; Cervero, 1996) does suggest that the ease of parking has a significant influence on car use.

This access to free or inexpensive parking indicates that the relative cost of the ferry service must be able to compete with the *perceived* cost of car travel (Golob et al., 1979; Brog, 1993) which includes petrol and parking costs

Of the commuters to central Auckland and the North Shore who travel by car, one third stated they do not need their car during the day and a further third of those travelling to central Auckland sometimes need their car. The need to use the car for work is labelled by Brog (1993) as a "practical constraint" to public transport patronage. At least one third of commuters are therefore potentially "available" to take alternative transport to work or study.

Over 60% of commuters to central Auckland leave home before 7.30am with the majority of those individuals departing before 6.30am. The time taken to reach central Auckland, as would be expected, is closely related to the time of departure. Those leaving between 7.00am and 7.29am experience longer journeys. Most journeys take between 31 and 50 minutes. The importance of the length of journey time to choice of travel mode is well documented (Jones et al., 1993; Ortuzar et al., 1997).

The existing ferry service departs at 7.10am and arrives at approximately 8.00am in downtown Auckland. This departure time and journey length is similar to that experienced by commuters to central Auckland. The added time taken to travel to the ferry terminal needs to be considered (Ortuzar et al., 1997) when formulating a service that will compete with the car.

The travel patterns of commuters to the North Shore vary from those travelling to central Auckland in so far as the most common departure time from home is slightly later, between 7.00am and 8.00am. The journey is also considerably shorter; taking approximately 21-30 minutes for many (43.9%) and rarely longer than 40 minutes. Again the time of leaving home and trip length is closely related

and most travelling before 8.30am take between 21 and 30 minutes to arrive at the place of work or study.

Any ferry service to a location on the North Shore, such as Browns Bay, would need to ensure once again that the ferry trip together with the time needed to reach the ferry terminal on the peninsula did not far exceed the total journey time for commuting by car. These considerations will be examined further with issues such as the need for integration with other transport services. The ferry service provider should consider the preferred departure and arrival times at the North Shore terminal.

Current popular travel behaviour theories emphasise the importance of socio-demographics, such as the lifestyle of the individual, to the travel decision making process (Golob et al., 1979; Bernardino et al., 1993; Gane, 1999). An understanding of such factors enables operators and those providing infrastructure to plan for certain target markets.

The demographic profile of most commuters to central Auckland suggests that a typical commuter is likely to be a male aged between 40-59 years, living anywhere along the Whangaparaoa Peninsula and earning between $30,000 and $59,000. However, almost as high a proportion of those commuting to central Auckland earn over $120,000. Assumptions can be made regarding this "typical commuter", for example, there is less likelihood of a male commuter needing to stop to drop off children en route for work compared with female commuters (Goodwin, 1985).

Those travelling to the North Shore for their work or study are again typically in the 40-59 age bracket but are more likely to be female, could earn anywhere between $30,000 and $90,000 and mostly live at the western end of the peninsula. For a ferry service to appeal to these commuters it would need to be located closer to their place of residence than the current Gulf Harbour terminal. The residents' preferences for the location of a ferry terminal are discussed in section 5.5 below.

Non-commuting to central Auckland and to the North Shore

Commuters are likely to make up the bulk of patrons of a regular ferry service. A significant number of residents of the Whangaparaoa Peninsula, however, also travel to central Auckland and to the North Shore more than once a month for reasons other than regular work or study. To ascertain whether the ferry could be a possible mode of transport for such trips it is necessary to consider the "activities" associated with this travel. The "activity approach" to travel behaviour research is widely used (Jones et al., 1983; Goodwin, 1985; Hensher and King, 2001) and can include an understanding of the activities of the whole household and how this impacts on travel mode choice.

Most commuters travelled to central Auckland to visit friends or relatives, to shop, or to go out to movies or restaurants. Shopping and visiting friends or relatives were also the main reasons for non-commuting trips to the North Shore, with going out to movies or restaurants slightly less popular. The car was by far the most common form of transport for these excursions, which occurred both at weekends and during the week in most cases and was generally at off-peak times.

The number of such trips suggests that some off-peak services could be considered for the ferry service to give Whangaparaoa Peninsula residents the opportunity to have an alternative mode of transport for non-commuting activities.

5.2.2 Ferry users

Commuting to central Auckland

It was expected that those travelling to downtown Auckland by ferry were regular commuters and this expectation was confirmed by the results of the ferry survey (FQ2). These results showed that the reason for the ferry trip for all respondents was to travel to work or study and 85.2% made the ferry trip at least four times a week. Few ferry patrons changed to another mode of transport to complete their journey, with the majority walking from the ferry to their destination.

Plate 5.2.1 Gulf Harbour ferry at Pier 3 downtown Auckland

The research carried out in Sydney indicated that ferry users were less amenable to an interchange between transport modes than bus users (Daniels & Streeting, 2002). The same may be true of the Auckland ferry patrons, given the small number who transferred to a bus to complete their journey.

Ferry users showed no great interest in a fare package integrated with other transport services. This result may be related to the fact that most ferry users either drive to the ferry or are dropped off and do not use many forms of transport in their commuting trip. At present therefore the picture is of ferry users who travel by car to the ferry and by foot to their place of work. To encourage those who work at a greater distance from the downtown ferry terminal to take the ferry would appear to require a significant change in the mindset of commuters. The difficulties of

changing travel behaviour habits are well recognised by travel behaviour researchers (Goodwin, 1985).

The impact of weather on ferry travel was noted by some respondents to TQ1 as a factor in their decision to use or not use the ferry. The draft Ferry Strategy also noted the effect of adverse weather on the reliability of the Gulf Harbour service (PPK Environment & Infrastructure Pty Ltd, 2000). A luxury coach is provided to replace the ferry in rough weather but only two respondents (7.4%) viewed weather as having a negative impact on their travel by ferry.

One took issue with the fact that there was no cost reduction when the ferry did not run and a couple of respondents preferred not to travel by ferry in rough weather even if it was sailing. Most ferry users however indicated that weather had very little or no impact on their travel and indeed one went so far as to note that he preferred being on the ferry in the rain rather than sitting in his car for an extra half hour.

The fact that no respondents stated they used the ferry only in certain seasons may reflect the fact that the questionnaire was administered during the winter and these passengers were hardy all year round travellers. A different response may have been obtained in the summer. Some who are more concerned about the weather may only travel in the summer and research suggests there is more likelihood of leisure travellers at that time of year (Graham & Russell, 2001).

The back-up bus service was considered "impressive" by a number of respondents, however, the perception of variable reliability due to weather may be a factor in the choice by some not to take the ferry. The issue of reliability relates to the delivery of a quality service (Brog, 1985; Carlsson, 2003) and is deemed essential to the ability of public transport to attract passengers (Ortuzar et al., 1997). It will be considered again in the context of the reasons for non-use of the ferry in section 5.7 below.

Non-commuting travel to central Auckland and the North Shore

Nearly all ferry users' make non-commuting trips to central Auckland at least once a month and almost half do so more than five times a month. They are not quite such frequent visitors to the North Shore, although a large number make the trip one to five times a month. Travel to both destinations occurs during the week and at weekends, although slightly less frequently mid-week, suggesting a weekend service may be worth considering.

The activities for which trips are made were examined (Steg et al., 2001) as the type of activity of members of a household can influence the travel decision of individuals (Dalvi, 1979). Trips to central Auckland were often work related although "shopping", "visiting friends or relatives" and "going out" were other reasons for non-commuting journeys. Trips to the North Shore were commonly for "shopping", "visiting friends or relatives" and "going out". These types of trip may well be possible by ferry if the destination is not too far from the current downtown terminal or any proposed North Shore terminal.

The demographics of ferry users, who are all commuters, resemble closely the profiles of the non-ferry commuters in terms of age range (40-59 years), although more women than men catch the ferry to the city. Proximity of the place of residence to the ferry terminal appears to be a factor in the decision to use the ferry as all ferry patrons live east of Manly. The importance of total trip time in the choice of travel mode is widely recorded (Jones et al., 1983; Ortuzar et al., 1997) and inevitably, the further away from the terminal an individual lives, it is fair to assume the less likely is the choice to use the ferry.

5.3 Satisfaction with current travel mode

The level of satisfaction with an existing mode of travel has been shown to influence future travel decisions (Brog, 1993; Decrop, 2001). There is a clear difference in levels of satisfaction between those able to travel out of peak hours and those facing rush-hour traffic. The reason for dissatisfaction or satisfaction is also important to ascertain as in the case of many, the reason given is that there is no alternative. This has variously resulted in a seeming resignation, and therefore a measure of satisfaction with the only available option, or in dissatisfaction.

5.3.1 Non-ferry users

Commuters

Those who commute to work or study, principally by car, have expressed a general level of satisfaction with that travel mode, especially those who commute to the North Shore. This satisfaction means it may be difficult to encourage a change in travel behaviour to use public transport, particularly the ferry service. Travel behaviour is generally well entrenched and most writers agree that changing that habit usually requires a significant deterioration in the current travel mode (Goodwin, 1985).

For just over 40% of those who are satisfied with their travel by car, the reason for that satisfaction is either the flexibility and independence it affords, or convenience. These issues are commonly recorded as the reasons why it is difficult to entice commuters away from their cars (Stopher & Gordon, 2003) and are related to the frequency and routes provided by other public transport services trying to compete with the car (Pharaoh & Apel, 1995).

An equivalent number of respondents cited the lack of alternatives as the reason for their satisfaction or feeling of neither satisfaction nor dissatisfaction with their current mode of commuting. Research has shown that those with no real alternative

means of travel express lower levels of satisfaction with that mode than those who freely choose their form of transport (Golob et al., 1979). Those who have considered the issue of constraints on consumer behaviour and on travel behaviour have mentioned lack of information as one of those constraints (East, 1990) and also the influence of "perceived constraints" on travel choice (Golob et al., 1979).

It is possible that the absence of an alternative is not real for some commuters, although that is their perception. This misconception may arise from the lack of information available about the service.

The fact that there may be alternatives, but commuters prefer the car, accounts for a higher level of satisfaction than the literature suggests is usual in a situation of severe traffic congestion and delays, such as exists on the Whangaparaoa Peninsula (Brog, 1993). More emphasis on communicating the details of the ferry service and its availability and benefits may impact on the travel decisions for some of these commuters (Cervero, 1996).

One tenth of the commuters, who gave a reason for their level of satisfaction, expressed dissatisfaction with their current travel mode because the journey takes too long. The importance of journey time to travel decisions has been emphasised in many studies (Olsson, 1993; Ortuzar et al., 1997). It suggests that the ability to provide a faster service overall (total trip time, including journey to the ferry terminal at each end) could play a part in increasing ferry patronage.

Non-commuters

Similar results concerning levels of satisfaction with current travel modes were obtained for residents of the Whangaparaoa Peninsula in respect of non-commuting trips to central Auckland and the North Shore. Those who make those journeys by express bus were slightly more satisfied than those travelling by non-express bus. The single respondent who takes the ferry for non-commuting trips to the city expressed satisfaction. This result may well tie in with the concern over the length

of the journey (Ortuzar et al., 1997), as the principal reason given for dissatisfaction was the journey taking too long. There was no greater satisfaction for these non-commuting journeys in comparison with commuting trips, even though they were mainly out of peak hours and therefore shorter in time.

The reasons for satisfaction again centred on the convenience and independence or flexibility afforded by the current means of travel and included the lack of any alternative. It is of interest that the lack of an alternative travel mode was given as a reason for satisfaction, for dissatisfaction and by those who were neither satisfied nor dissatisfied.

The same observations concerning the real or perceived absence of alternatives apply to these non-commuting trips (Golob et al., 1979). It should be remembered however, that there are fewer alternatives available for most forms of public transport at weekends and during off-peak hours, when many of these non-commuting trips occur.

Both commuters and non-commuters gave traffic congestion as the principal reason for delays. Comments made by some respondents to the effect that "if you live on the Peninsula you have to expect traffic delays" may account for the seeming acceptance of the difficulties with car travel and the assumption that there are no alternatives – "you just have to put up with it."

5.3.2 Ferry users

Commuting

Ferry patrons are very satisfied with their ferry travel to work or study and gave a range of reasons for their satisfaction. These reflected the importance of operative service features or attributes (Friman & Garling, 2001; Berry et al., 2002) such as reliability and good amenities on board, as part of the "sensory experience".

The other "humanics" (Berry et al., 2002) or human part of the sensory experience for this particular set of consumers, was particularly evident in the comments concerning the friendly, professional crew, and the camaraderie and social aspect of the journey. Another part of this "sensory" aspect noted by many recent consumer behaviour writers as a crucial part of the consumer decision making process (Decrop, 2001; Berry et al., 2002; Bateson, 2002), is the importance placed on the relaxing and stress free qualities of ferry travel.

A number of ferry patrons made the point that they appreciate the ability to work or study during the ferry trip. The opportunity to use travel time in this way is valuable, given the recognition of the importance of time in relation to travel (Ortuzar et al., 1997; Daniels & Streeting, 2002). Such a benefit of ferry travel is not often promoted by operators who tend to focus on the attributes of the operational side of the ferry service (PPK Environment and Infrastructure Pty Ltd, 2000).

Decrop (2001) cautioned that despite the relevance and importance of levels of satisfaction to consumer decision-making, it is important to bear in mind that satisfaction does not always result in a repeat purchase. Conversely dissatisfaction does not necessarily cause a consumer to change behaviour. Factors such as emotions or variety seeking behaviour can also intervene.

5.4 Ferry service features

5.4.1 Frequency

A prominent factor in the literature on the delivery of a quality public transport service and in the studies of the factors that influence travel behaviour, is the issue of frequency of services (Brog, 1985; ECMT, 1993; PPK Environment and Infrastructure Pty Ltd, 2000; Daniels & Streeting, 2002). The importance of this service attribute is reflected in the results obtained to TQ1, where the single most

important factor leading to ferry use amongst Whangaparaoa Peninsula residents was the frequency of the service offered.

Current ferry patrons find the frequency of the service inadequate in the main. Many suggestions were offered by these passengers to improve the present inflexibility of travel options: two peak time trips each way, a little earlier in the morning and later evening sailings were common propositions, amongst many others.

The results of the West Harbour survey of potential ferry patrons (Gomez, 2003) showed the attribute most important to those respondents was a service that operated at convenient times. In the Gulf Harbour ferry study, patrons did indicate that they would patronise the service more regularly if the frequency increased. An opportunity to increase the number of regular sailings does appear crucial to encouraging more regular ferry patronage.

An increase in service frequency may also go some way to achieving a measure of competition with the autonomy and flexibility the car affords. The difference between the frustration of having to wait for a scheduled sailing time and the ease of being able to choose at any time to travel by car would be lessened if sailings were frequent.

5.4.2 Reliability

The issue of reliability of the ferry service, which is an aspect of the quality of the service provided (Brog, 1985; Fitzsimmons & Fitzsimmons, 2001; Carlsson, 2003), has been discussed in terms of the impact of weather. For those who choose to use the ferry, reliability was cited by over half as an important factor leading them to use that service.

For those who commute to central Auckland and the North Shore by other means, reliability was mentioned by very few as likely to lead them to use the ferry. This discrepancy may once again result from the lack of true understanding or knowledge on the part of non-ferry users about the reliability of the service and the fact that a comfortable coach is always provided for transportation when weather prevents sailing.

Researchers (Golob et al., 1979; Brog, 1993) have identified the effect of misconceptions such as this as a "perceived constraint" in the travel decision process. Better communication of the service features might address this lack of understanding.

5.4.3 Price

There are some conflicting opinions amongst theorists from different disciplines concerning the importance of price to the decision to purchase a service such as a certain type of travel. The service management writers consider that the difficulty in comparing costs of services objectively make it harder to compete on price in a service industry such as transport, than with products (Fitzsimmons & Fitzsimmons, 2001).

The costs of acquiring the service do not only relate to the price of the service itself. They also include the convenience aspect of the service, which in the case of the ferry can mean ease and cost of parking at the terminal and cost of other transport needed to reach either the ferry or the destination after the ferry. The parking at the terminal, which is shown below in Plate 5.4.1, was considered a significant factor for a tenth of those commuting to central Auckland.

Plate 5.4.1 Parking at Gulf Harbour ferry terminal

Certainly in terms of factors influencing business travellers, cost is seen by many as less important than quality (Carlsson, 2003). Some public transport studies have found price to have limited influence on the choice of travel mode on its own (Brog, 1993). The residents of the Whangaparaoa Peninsula in TQ1, however, rate price alongside frequency as very important to choosing whether to catch the ferry.

The preferred price was $10.00 for a return ticket to downtown Auckland with those commuting to the North Shore indicating a willingness to pay slightly more for this journey. This answer may be because these commuters to the North Shore are less likely to take the ferry on a regular basis to the city. In actual fact the current price for a single trip to downtown Auckland costs $12.00 with a ten-trip concession available for $99.00. Further concessions for more trips can be obtained, but it remains that the current non-concession fare is higher than the price preferred by most commuters.

The ferry users tended to find the price level fair, although a quarter did find it expensive. The fact that they still used the service, despite this opinion, shows the validity of the research suggesting that price is not the key determinant for many travel decisions (Brog, 1993). Many ferry users commented on the appeal to them and also for perhaps tourists of a fare integrated with other public transport services. Integrated services and ticketing have been shown to have a positive effect on public transport patronage (Pharaoh & Apel, 1995) and did receive some interest from respondents in TQ1 when this option was given in the question regarding factors leading to ferry use.

The issue of subsidies does have an impact on price levels. The fact that local authorities in Auckland provide an extremely low level of subsidy for ferry services in comparison with most cities running similar services, masks the fact that of all urban ferry services in Auckland, the Gulf Harbour service is the most heavily subsidised (FerryBiz Solutions Ltd, 2001a; K. Brown, personal communication, 12 June 2003). For the Gulf Harbour service to compete on costs with the bus service and the perceived costs of travelling by private car, it may be that the subsidy must remain to keep prices low until levels of patronage can be increased. From the results of the questions regarding price, there appears to be little room to increase the price level, without running the risk of losing even more patrons.

Strategies employed in European cities to promote public transport have included subsidies (Pharaoh & Apel, 1995). Some writers, however, have stressed that it is possible to run successful public transport systems and achieve good levels of patronage without subsidies, through efficient, reliable and frequent services (Brog, 1993).

5.4.4 Onboard services

The services that can be provided on board the ferry include the provision of food and beverages, newspapers, free carriage of bicycles, a children's area, computer

workstations and comfortable seating. These services did not feature as a major incentive leading non-ferry users to use the ferry but for the non-ferry users who nominated the services they would like to see on a ferry, comfortable seats were by far the most important, followed by quality food and beverages.

For most ferry patrons, onboard facilities were again not the most important factor leading to ferry use, but the services they liked onboard were the provision of newspapers followed by quality food and beverages and comfortable seats. Many comments were made to the effect that they would like more legroom and better back support in the seating.

Comfort has been recognised as part of the quality of the service provided by public transport services (ECMT, 1993; Ortuzar, et al, 1997) and part of the "sensory experience" influencing a consumer to choose a service (Berry et al., 2002). The consensus amongst ferry users and non-ferry users concerning the importance to them of comfortable seating is worthy of note and falls in line with travel behaviour writing on the significance of the quality of the service to the likelihood of patronage (Carlsson, 2003). Overall, however, neither ferry users nor non-users rate comfort as highly as frequency or price in terms of influencing the decision to travel by ferry.

Integration with transport network

Integration with other public transport services can be accomplished through a number of strategies:

- A combined fare package available across services
- The co-ordination of services in terms of timetable and departure points so that commuters can interchange smoothly between services
- The integration of modes of transport such as bicycle and rail (Pharaoh & Apel, 1995; Hensher, 2000).

All of these systems have been shown to correlate with high levels of patronage (Hensher, 2000) and comments made by a number of respondents to both surveys TQ1 and FQ2 suggest that there would be interest in further integration of public transport services. Daniels and Streeting (2002) noted that their research indicates that ferry patrons are less likely to choose to change from one mode to another in the course of a single journey than bus patrons. This factor may account for the low priority given to an integrated fare package as a factor leading to ferry use, in contrast to frequency, travel time, price and, for the current ferry travellers, avoidance of traffic.

The trial integration of some transport services in Auckland, discussed in Chapter Two, has not included the Gulf Harbour ferry service as the operator Kawau Kat has not participated in this pilot scheme. If the ferry operator of this service were to consider participating in any future trial, it may have to be acknowledged that this is not considered a high priority by the majority of residents or ferry users.

5.4.5 Service to or via Browns Bay

There is no great support from the residents of the Whangaparaoa Peninsula for either a service to Browns Bay or one that stops at Browns Bay en route for downtown Auckland. A third of respondents did declare they would be likely to patronise such a service even occasionally, but there was no particular interest from those who commute to the North Shore. They would have been the respondents likely to provide a potential regular patronage.

The main concern for current ferry users over any service stopping at a terminal on the East Coast of the North Shore, such as Browns Bay, is the likelihood that this would increase the total journey time to their downtown destination. The importance of total trip time is particularly high for commuters (Olsson, 1993; Ortuzar, 1997) but is a significant consideration for most patrons of public transport

services. This concern must be noted as any addition to the journey time for the Gulf Harbour – Downtown service could well result in decreased patronage.

5.5 Preferred terminal location

A significant relationship was established between the likelihood of using the ferry from a location other than Gulf Harbour and the work or study destination of commuters using the data obtained from TQ1. Only 20.3% of those currently commuting by car or bus stated they would be likely to use a ferry service departing from a different terminal, with this opinion being spread fairly evenly between those travelling to central Auckland and the North Shore. This relatively low level of support for ferry use from a different location is probably a reflection of the very limited interest at present in a ferry service, but is considerably higher than the current rate of use of the commuter ferry service amongst all commuters to central Auckland.

The proximity of the terminal to the place of residence of possible ferry patrons relates to the overall length of the journey. The importance of total trip time in travel decision-making has been emphasised throughout this study (Olsson, 1993; Ortuzar et al., 1997). How far an individual must travel and how long the journey is to reach the ferry terminal will inevitably greatly influence the decision whether to travel by ferry.

Current ferry patrons of the Gulf Harbour service were happy in the main with the location of the terminal, although 18.5% did state that Arkles Bay would be their preferred terminal location. If the terminal were to move from Gulf Harbour however, well over a third of current patrons thought it unlikely they would patronise the service. The impact of any terminal move on existing patrons would have to be carefully monitored.

The possible terminal location that received more positive responses than any other from the residents of the peninsula was Arkles Bay. Those who commute to work were especially supportive of this option ahead of Gulf Harbour.

A significant relationship does exist between the likelihood of using the ferry from a location other than Gulf Harbour and the preferred terminal location. The results, however, would seem to indicate an ambivalent attitude towards ferry travel as nearly half of those who stated they would be unlikely to use a ferry from a location other than Gulf Harbour still chose Arkles Bay as their preferred terminal location, well ahead of Gulf Harbour. Conversely nearly one fifth of those who thought it likely they would use a ferry from another terminal, still preferred Gulf Harbour as the terminal.

These results suggest that Arkles Bay is a very popular choice for a ferry terminal, most probably because of its more central location on the peninsula than Gulf Harbour. A number of Arkles Bay residents, however, were not supportive of a terminal that might disrupt their bay with increased traffic. The viability of constructing a ferry terminal at this location would have to be fully investigated together with the benefit of making a significant investment in such infrastructure. Weiti River has been proposed by some ferry operators as another possible location for a terminal (Beca et al, 2000a) but this was not suggested by many respondents as an alternative in this questionnaire.

Increasing access to the ferry terminal by bus links and providing a terminal closer to more of the population on the peninsula fits with the provision of a more comprehensive transport system. This would be a system that is available to all sectors of society, not only those with cars (Koutsopoulos & Schmidt, 1994; Cervero, 1996). Opportunities to access a variety of transport options and cater for a wider range of needs has been promoted as the objective of public transport systems (De Boer, 1994; Hensher, 2000).

Most researchers in the travel behaviour field do acknowledge the difficulty of changing entrenched travel patterns and habits (Goodwin, 1985, Stopher & Gordon, 2003). There is an indication, nevertheless, that if the service was altered slightly to improve ease of access and reduce total travelling time (Ortuzar, 1997) by changing the terminal location or adding another terminal, it may be possible to encourage more residents of the Whangaparaoa Peninsula to try ferry travel.

Plate 5.5.1 Gulf Harbour ferry terminal ticket office

5.6 Implications of reasons for choosing not to travel by ferry

Well over half the respondents for TQ1 indicated they would never use the ferry service to travel to downtown Auckland or to the North Shore. The value of investigating the "non-user" sector of potential consumers of a service, particularly form a marketing viewpoint, has been promoted by consumer behaviour researchers (Hudson, 1999).

Not surprisingly, a large proportion of those who indicated they would never use a ferry service, live at the western end of the peninsula. A significant relationship exists between the reason for not using the ferry service and place of residence. Those living at the western end of the peninsula have cited the fact that the services do not go where needed and the car being required during the day, as primary reasons. For other peninsula residents, these same two factors were the most influential, although cost and infrequency of the service also impacted on the decision not to travel by ferry.

The results for this line of questioning fit within the analysis of the travelling public who do not use public transport conducted in Germany by Brog (1993). The need to use the car during the day has already been discussed in this chapter as a "practical constraint" (Brog, 1993) that means those individuals cannot use public transport. According to Brog, public transport is not an alternative either for individuals where services do not serve their destinations.

Of the remaining individuals who could use the public transport service but have a "negative opinion" (Brog, 1993) and choose not to for reasons such as cost, frequency of service or comfort, a targeted marketing strategy could be designed. The issues of cost, frequency and reliability have been raised by both ferry users and non-ferry users in earlier discussions and these key factors in decisions to use the ferry should be the focus of both operators and local authorities aiming to increase ferry patronage.

The lack of information concerning the features and benefits of the service can contribute to non-use (Brog, 1993; Cervero, 1996) and was mentioned by some respondents who do not currently use the service. The importance of communication is stressed in service management writing (Fitzsimmons & Fitzsimmons, 2001) and is an area that must be addressed in any plans to improve patronage.

The responses obtained from both users and non-users of the ferry service have many common themes in terms of concerns or issues that have a bearing on the decision about which form of transport to choose for travel from the Whangaparaoa Peninsula to either North Shore City or central Auckland. For example the timetabling and frequency of services is important to all respondents. The data gathered from the two questionnaires (TQ1 and FQ2) provide an understanding of the considerations which make up the travel behaviour of individuals living on the Whangaparaoa Peninsula and can assist in the development of a model for that decision-making process.

5.7 Travel behaviour model

The literature review in Chapter Two considered several conceptual models for consumer behaviour and decision-making. In particular, popular models for travel decision making in a tourism context were discussed (Mathieson & Wall, 1982; Hudson, 1999). These models are of assistance in focussing on the key elements in the travel decision making process and thus aid in the understanding of what factors influence choice and how services can be adapted and promoted to increase patronage.

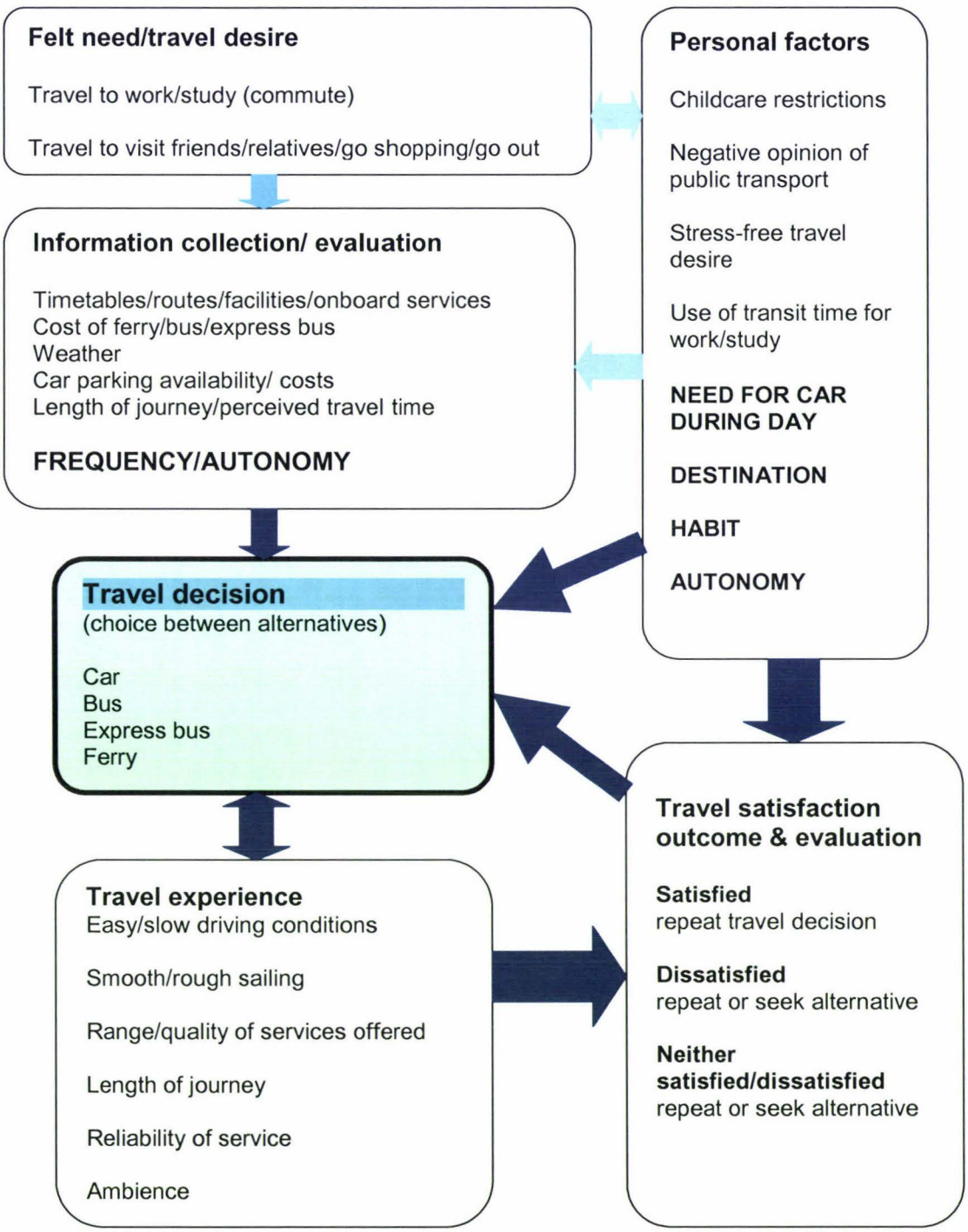
The results obtained from this study can be applied to a model that has been adapted from the travel-buying behaviour model of Mathieson and Wall (1982) (see Fig.2.3.2, p. 16 of Chapter Two herein) for the individual circumstances of the consumers in question, the residents of the Whangaparaoa Peninsula. The factors that make up the individual's travel decision process according to the results of the surveys TQ1 and FQ2 are included in the model.

The original linear model of Mathieson & Wall (1982) has been criticised for its simplistic approach in not emphasising the greater importance of some factors over others in the decision-making process (Swarbrooke & Horner, 1999). Ostensibly

the travel decision-making for a commuter could be considered less complex than for a tourist, but the findings of this study clearly indicate that multiple factors influence a commuter's travel behaviour and some clearly have greater weight than others.

The travel decision-making model developed in Figure 5.7.1 incorporates the various factors contributing to travel behaviour outlined in this chapter and Chapter Four, but moves away from a strictly linear approach and indicates how many aspects of the process are linked. The five stages in the process originally described by Mathieson and Wall (1982) are retained, however the importance of personal factors is emphasised by their inclusion as an input into all stages of the process.

Figure 5.7.1 Travel decision making for residents of the Whangaparaoa Peninsula



Source: adapted from Mathieson and Wall (1982) Travel buying behaviour

5.8 Summary

The implications of the results of the analysis of the data collected in the two questionnaires, TQ1 and FQ2, have been discussed in this chapter. A clear picture has emerged of the current travel preferences of the respondents and to some extent their future preferences in respect of ferry travel have been explored. A model for travel decision-making by the residents of the Whangaparaoa Peninsula has been developed using the results of the surveys.

The final chapter of the thesis looks at the fulfilment of the objectives of this research and sets out the conclusions and recommendations that emerge from the findings. The success and limitations of the study are examined and there is a discussion of future research that is suggested by the outcome of this investigation into the travel preferences and the potential for ferry patronage of the residents of the Whangaparaoa Peninsula. The thesis concludes by assessing the significance of the findings for both those who are involved in managing ferry services and for the field of travel behaviour research.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Fulfilment of thesis objectives

Ferries form part of the current strategic transport plan for regional authorities around Auckland (ARC, 1999b; PPK Infrastructure Pty Ltd, 2000; Booz-Allen & Hamilton (New Zealand) Ltd, 2000a). This focus, coupled with ongoing concerns over the severe traffic congestion affecting movement along the Whangaparaoa Peninsula have led to the consideration of ferry travel as a possible solution, or at least partial solution to improving access from the Whangaparaoa Peninsula to downtown Auckland and North Shore City.

The ferry service operating at present from Gulf Harbour is not well patronised. A number of bodies, including operators and those managing the infrastructure to support the service, are searching for an understanding of how to increase passenger numbers and of the real potential market for ferry travel.

The aim of this study has therefore been to gain a better appreciation of the existing travel behaviour of the residents of the Whangaparaoa Peninsula, at the same time as ascertaining their preferences for travel mode and the factors that impact on any decision to travel by ferry. The survey, which formed the basis of the research, successfully collected a variety of data from both current ferry patrons and non-users. Current travel patterns have emerged, as has an expression of the level of satisfaction with present transport modes and perceptions of ferry travel.

The service features selected by survey respondents as most important to their travel decision accorded with the results of research reported in the travel behaviour and public transport literature. This has enabled a clearer picture to be formed of what service amenities may encourage increased patronage and may improve the likelihood of more residents choosing to use the ferry. The preferred location for a ferry terminal has been established and this too impacts greatly on the decision whether to choose ferry travel.

It is clear that some residents of the Whangaparaoa Peninsula choose not to travel by ferry and many respondents have explained why in their responses to the survey. An appreciation of the motivations of these "non-users" is of assistance in assessing patronage potential.

A model for travel decision-making by the residents of the Whangaparaoa Peninsula has been developed from a tourist travel buying behaviour model (Mathieson & Wall, 1982) by incorporating the results from the survey data and their subsequent analysis. This model can be adapted to apply to travel decision-making by residents of other localities.

The objectives of this study have therefore been met and the analysis of the survey data and subsequent discussion, related in Chapters Four and Five, provide the basis for some sound conclusions and recommendations.

6.2 Important findings

The responses to the travel survey of residents of the Whangaparaoa Peninsula have shown a high level of frustration with traffic congestion and associated delays and the inadequacy of existing public transport options. Despite the concern expressed by respondents over severe traffic delays travelling to central Auckland and to the North Shore, many declared they were still satisfied with travelling by car. They commented

on the convenience and flexibility it affords, not to mention the fact that a number simply enjoy sitting in their cars!

The significance accorded to the flexibility and convenience of car travel has a strong bearing on the features of a ferry service that non-ferry users perceive as important. The frequency and reliability of any service, factors pointing to the overall quality of the service, are crucial to encouraging increased patronage. They go some way to enabling the ferry to compete with the level of autonomy provided by the private car.

Price is also likely to influence the decision whether to choose ferry travel over the car or other forms of public transport. Although current ferry users appear to appreciate the non-financial benefits of ferry travel such as its social and "stress-relieving" qualities, those that have not experienced this aspect of the travel mode need to be convinced to try it with financial incentives.

The length of the journey in terms of travel time is a concern for both current and potential ferry patrons. As the travel behaviour literature states, commuters in particular, tend to choose a travel mode that will allow them to arrive at their destination in the shortest possible time. The ferry service must be able to compete with the total trip time, including arriving at the ferry terminal, to be an attractive option. There is room for promoting the opportunities for using the ferry journey to work or study but this is not a factor rated highly by most commuters.

The linkage of the Gulf Harbour service with any service established between Browns Bay and downtown Auckland would only be supported if no real increase in travel time resulted. Since it is almost impossible to guarantee no lengthening of journey time, combining the two services may well have a detrimental effect on a service from the Whangaparaoa Peninsula.

The expectation that the suggestion of siting a ferry terminal at a more central location along the Whangaparaoa Peninsula than the current Gulf Harbour Marina would be

considered favourably by many residents of the Whangaparaoa Peninsula has been vindicated in this study. Arkles Bay is the favoured site, although Gulf Harbour is still a clear second.

Public information about the current ferry service and attributes of ferry travel in general appears very limited. Respondents made the point that they knew little about the service and misconceptions about the effect of weather on reliability exemplified this lack of real appreciation of how the service operates.

Some commuters to central Auckland need to travel by car and will not be able to alter their travel behaviour, through "practical constraints" such as the need to use the car during the working day. The number of residents of the Whangaparaoa Peninsula commuting regularly to central Auckland is not high, although the population around the Gulf Harbour area is growing as land is developed and may provide future ferry patrons. Nevertheless, a significant increase in ferry use from the existing Gulf Harbour site may be very slow to develop, even if services are increased and the profile of the ferry service raised through intense marketing and dissemination of information.

The prevalence of the "car culture" and the geographic location of the present ferry terminal mean that the overall likelihood of many switching to ferry travel is not significant. However, there is sufficient support for ferry travel to warrant further investigation from a technical and operational perspective. It is also worth bearing in mind the contribution of a ferry service to the culture and image of a city such as Auckland that prides itself on being the "City of Sails".

6.3 Recommendations

The results of this research raise a number of issues that suggest recommendations for both those who manage the operational side of the ferry service and those who manage the infrastructure and local government environment in which the service operates:

1) **Improve the quality of the ferry service**

Frequency

Reliability

Travel time

Comfort

On the basis that the objective of these parties is to increase ferry patronage, it is necessary to address the issue of provision of a quality ferry service in terms of frequency, reliability, travel time and level of comfort. The frequency of the existing service is inadequate and a return to at least two peak time sailings each way appears essential. This should be coupled with improved reliability in adverse weather situations by possibly commissioning a larger vessel. A larger, faster ferry will also improve travel times and concerns over comfort would be addressed if a larger ferry has more spacious seating.

2) **Introduce a competitive fare price**

Increase subsidy

Match cost of alternative travel modes

The significant cost of providing such a service with still limited patronage is acknowledged, as is the current high level of subsidy provided by the ARC for the Gulf Harbour ferry in comparison with other Auckland services. A long-term commitment has to be made, however, to provide a quality service, if it is to become a realistic travel option for Auckland commuters. This may entail increased subsidies, at

least in the medium term, to enable fares to be set at a competitive rate. It is essential that the price of ferry travel be perceived as comparable with the cost of car travel and other transport modes. Significant savings for passengers through very economic multiple trip concession cards have the potential to encourage regular use of a ferry service.

3) **Improve communication**

Provide service information to all residents

Market the benefits of ferry travel

Promotion of the ferry service as an attractive mode of travel is the concern of both commercial operators and local authorities. Extensive, effective communication is pivotal to raising the profile of ferry travel and informing the travelling public of its advantages. Raising public awareness and support is particularly important if more public money is to be spent on improving and extending the service. Details of the timetable, cost and onboard facilities should be distributed widely to all households on the Whangaparaoa Peninsula.

4) **Integrate the ferry service into the regional transport network**

Investigate integrated fare packages

Investigate integration of services

The integration of the ferry service with the wider transport network is worthy of some consideration and may assist in gaining public support. Results of this study did not indicate that this is a priority, but it should form part of the strategic plan for ferry services. Integration should be undertaken in respect of the ticketing and timetabling. The provision of Park and Ride and Bike and Ride options should be examined.

5) **Consider additional/alternative ferry terminal**

Arkles Bay

The location of the ferry terminal does play a large part in the decision of many residents not to travel by ferry. Previous studies have indicated that extensive work would be required to establish a ferry terminal at Arkles Bay (Jamieson & Williams, 1998). Notwithstanding that fact, the support shown by this research for a terminal at Arkles Bay points to the validity of conducting an up to date technical survey and feasibility study for establishing a ferry service from a more central location on the Whangaparaoa Peninsula. It may also be worth considering the possibility of running vessels, such as hovercraft, which require a simpler infrastructure to operate.

6.4 Success and limitations of research

The survey of both the residents of the Whangaparaoa Peninsula and current Gulf Harbour ferry patrons has provided extensive useful data, the analysis of which has enabled all research objectives to be fulfilled. A good response was obtained to the main travel questionnaire (TQ1) with 308 valid completed questionnaires (44%). This has meant useful statistical analysis has been conducted and some significant relationships identified. The ferry users' questionnaire (FQ2) was successfully administered to 27 passengers. Again, this was an extremely good rate of response, being very close to a census of the regular ferry patron population (approximately 25-30 patrons).

The limitations of this research were highlighted in Chapter Three. In terms of age and gender, the sample cannot be said to be representative of the sample frame as there were fewer responses from men and from those in the over 60 age bracket than was expected. The fact that the sample could therefore be described as representing the commuting population, in regard to age, has been explained. Any

future study of the travel behaviour of this population could attempt to address the imbalance in the gender split.

As a result of this limitation, the ability to generalise the results of this study to the residents of the Whangaparaoa Peninsula must be qualified to some extent. Nevertheless, the proportion of respondents of each gender does follow the broad spread of the population of the peninsula and the study has provided a useful indication of travel behaviour and preferences, which reinforce the findings of travel behaviour research.

It must also be recognised in a study of this kind, where open ended survey questions have elicited comments from respondents, that the application of qualitative data is limited. Qualitative data are inherently subjective (Zikmund, 2003) and the way results are interpreted are a matter of judgement, therefore cannot be generalised to the whole population in the same way that is possible with quantitative data. Nevertheless these comments do provide a richer context for the quantitative data and in this case aided the investigation into the reasons behind some travel preferences and decisions.

A related point is the possibility that has already been discussed that the *stated* preferences of individuals, in terms of the type of travel behaviour they intend to, or would like to exhibit, may not be carried through in their actual or *revealed* travel behaviour (Garling & Sandberg, 1997). Personal circumstances, external factors or a reluctance to change established patterns of behaviour or habits may override intentions to use a certain mode of transport. The data that has been collected concerning the likelihood of patronising the ferry and opinions concerning the maximum price potential patrons would pay are helpful to provide an indication of possible behaviour and preferences, but cannot be considered definitive evidence of such.

6.5 Future research

This study has set the scene for further research on two levels. In relation to the Whangaparaoa Peninsula ferry service, before implementation of the recommendations made above, an in-depth stated preference study could be conducted. It should focus on commuters to central Auckland and incorporate any specific proposed modifications to the current service in hypothetical scenarios. Focus groups may also be of assistance in developing a more detailed appreciation of the gaps in knowledge of the local residents concerning the existing service and its benefits.
Possible research questions are:

- What are the travel preferences of those commuting from the Whangaparaoa Peninsula to central Auckland in the case of (Scenario A/B/C)?

- How great is the gap in knowledge of the residents of the Whangaparaoa Peninsula concerning the ferry service?

In terms of general travel behaviour research, this study has highlighted the difference between the "mentality" of car users and that of individuals who choose to travel by ferry. A comprehensive study of the impact of changing certain travel mode variables on car users' perception of ferry travel, through a stated preference survey, would develop this understanding. A greater insight would be gained as a result into whether the sceptics, who consider the promotion of any alternatives to car travel as outdated, are indeed right. A possible research question is:

- How do car users' perceptions of ferry travel change in light of variations in the ferry service offered?

An area touched on in some of the European literature reviewed in Chapter Two, that could be explored further, is that of individuals' perceptions of their role in improving

the collective transport system and reducing traffic pollution. A possible research question is:

- What is the perception of commuters of their role in improving the transport system and reducing traffic pollution?

6.6 Significance of findings

This research makes a contribution to the knowledge of travel preferences and travel behaviour by providing a greater understanding of the factors leading to ferry use. The impact of the needs and desires of commuters on the choice of mode, in respect of the quality, flexibility and convenience of their preferred travel mode, has been borne out by this study. The importance of these personal factors in travel decision making exhibited in this research has reaffirmed the growing awareness amongst travel behaviour theorists that psychology has a clear role in understanding travel behaviour.

The findings, in respect of the factors that influence travel behaviour, have enabled the development of a travel decision-making model for the residents of the Whangaparaoa Peninsula (see Figure 5.1, p.163). This model, which shows how many stages in the travel decision process loop back to influence each other, also emphasises the importance of personal determinants to that process and the greater importance of some factors over others. It is capable of being adapted to provide an understanding of the travel decision-making process for the residents of any locality

It is also evident from this study that the factors influencing travel mode choice in respect of the ferry mirror closely those shown in prior research to be important to choosing other modes. The extra ingredient that encourages many to select the ferry

over comparable transport is the "stress-free" factor of travelling on the water away from the pollution and congestion of the city streets.

It is hoped that these findings will enable those bodies charged with operating the ferry network around greater Auckland to take steps, motivated by the true needs and desires of the travelling public, to improve the current Whangaparaoa Peninsula and other ferry services. As a result, many more commuters may be encouraged to leave their cars at home and enjoy the benefits of travelling on Auckland's attractive waters.

Plate 6.6.1 Ferry departing Gulf Harbour marina

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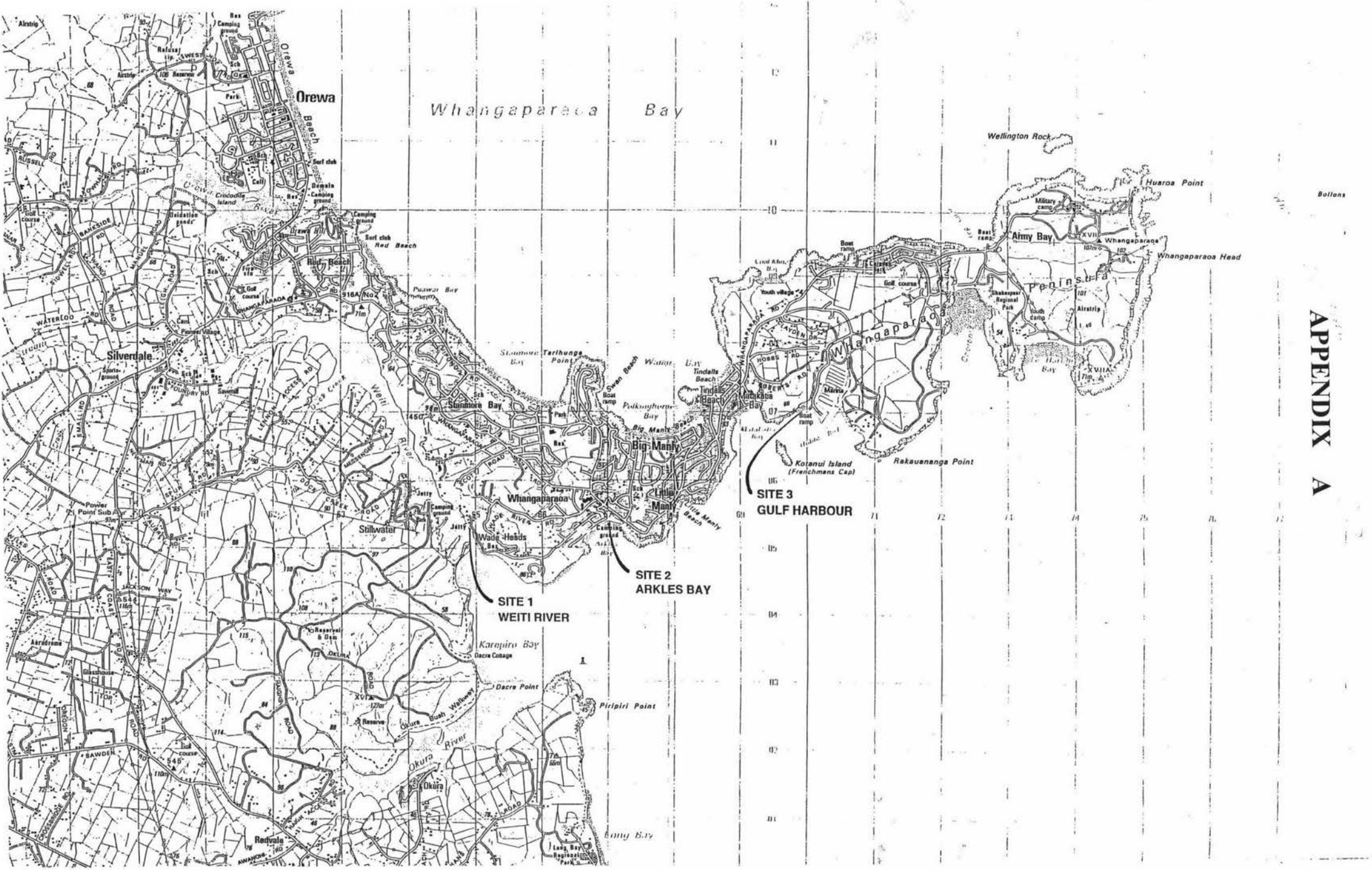
Whangaparaoa Bay
Orewa
Silverdale
Stanmore Bay
Big Manly
Whangaparaoa
Little Manly
Stillwater
Wade Heads
Karepiro Bay
Okura
Redvale
Army Bay
Whangaparaoa Peninsula
Wellington Rock
Huaroa Point
Whangaparaoa Head
Tindalls Beach
Jacksons Bay
Kotanui Island (Frenchmans Cap)
Rakauananga Point
Piripiri Point
SITE 1
WEITI RIVER
SITE 2
ARKLES BAY
SITE 3
GULF HARBOUR

APPENDIX A

APPENDIX B

TRAVEL BEHAVIOUR QUESTIONNAIRE

SECTION 1

TRAVEL BEHAVIOUR

This section asks general questions about your travel behaviour. If you are unable to answer any question, please move on to the following one.

Q.1. What are your regular day-time activities during the week? (Please circle appropriate response)

1.	Work full time	5.	Retired
2.	Work part-time	6.	Unemployed
3.	Study full time	7.	Home duties
4.	Study part-time	8.	Other (specify) .....

If you do not work and/or study during the week, please go straight to Question 17

Q.2 Where do you usually travel to for that work and/or study?

1. Auckland central (within a circle from Ponsonby to Symonds Street to Parnell)
2. Within 5 km of Auckland central
3. North Shore (from Devonport to Albany)
4. Other (specify).....

If you answer Other, please go straight to Question 17

Q. 3 What is the **main** form of transport you **usually** use to make that trip? (You may circle more than one response)

1.	Car	6.	Ferry
2.	Bus - express	7.	Bicycle
3.	Bus – non-express	8.	Varies
4.	Motorcycle	9.	Other (specify).....
5.	Taxi		

more questions over page

Q.4 How often do you **usually** make that trip to work or study?

1. Once a week
2. Twice a week
3. Three times a week
4. Four times a week
5. Five times a week
6. Six times a week
7. More than six times a week
8. If less than once a week, state frequency.....

Q.5 What time do you **usually** leave home for that trip?

1. Before 6 am
2. Between 6am and 6.29am
3. Between 6.30am and 6.59am
4. Between 7am and 7.29am
5. Between 7.30am and 7.59am
6. Between 8am and 8.29am
7. Between 8.30am and 8.59am
8. Between 9am and 10am
9. After 10am
10. Other (specify).....

Q.6 How long does that trip to work or study **usually** take?

1. Less than 20 minutes
2. 21-30 minutes
3. 31-40 minutes
4. 41-50 minutes
5. 51-60 minutes
6. More than an hour

Q.7 What time do you **usually** leave work/study to return home?

1. Before 2pm
2. Between 2pm and 2.59pm
3. Between 3pm and 3.59pm
4. Between 4pm and 4.29pm
5. Between 4.30pm and 4.59pm
6. Between 5pm and 5.29pm
7. Between 5.30pm and 5.59pm
8. Between 6pm and 7pm
9. After 7 pm
10. Other (specify).....

Q.8 How long does that trip to return home **usually** take?

1. Less than 20 minutes
2. 21-30 minutes
3. 31-40 minutes
4. 41-50 minutes
5. 51-60 minutes
6. More than an hour

more questions over page

If your answer to Question 3 was "car" please answer Questions 9 – 11, OTHERWISE go straight to Question 15

Q.9 Do you **usually** need to use your car during the day apart from the journey to and from work/study?

1. Yes
2. No
3. Sometimes

Q.10 How many people are **usually** in the car for the trip to and from work/study?

1. 1
2. 2
3. 3
4. 4+

Q.11 How much do you **usually** pay for parking each day?

1. Nothing
2. Less than $2.00
3. $2.00-$5.00
4. $5.01-$10.00
5. $10.01-$15.00
6. More than $15.00

Q.12 How long does the trip from home to work/study **usually** take?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. More than one hour

Q.13 How long does the trip from home to work/study take **on a very slow day**?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. 61-70 minutes
11. More than 70 minutes

more questions over page

Q.14 What is the principal cause of delay?

.....

Q.15 How satisfied are you with your current mode of travel?

1. Very dissatisfied
2. Dissatisfied
3. Neither satisfied nor dissatisfied
4. Satisfied
5. Very satisfied
6. No opinion

Q.16 What is the reason for your answer to Question 15?

.....

.....

SECTION 2
TRAVEL TO CENTRAL AUCKLAND

Q. 17 For reasons other than work/study, how many times **a month** would you **usually** go into central Auckland (within a circle from Ponsonby to Symonds Street to Parnell)?

1. More than 10
2. 5-10
3. 1-5
4. Less than 1
5. Never

If you answer "Never" please go to Question 27

Q.18 What is the **usual** reason for such a trip? (You may circle more than one response)

1. Sports
2. Movies/restaurants/bars/cafes
3. Work related
4. Shopping
5. Visiting friends/relatives
6. Other (specify).....

Q.19 On what days would you **usually** travel?

1. Weekdays
2. Weekends
3. Both

more questions over page

Q.20 At what time of day would you **usually** travel? (You may circle more than one response)

1. Between 6.30am and 9.29am
2. Between 9.30am and 11.59am
3. Between 12 noon and 2.59pm
4. Between 3.00pm and 4.59pm
5. Between 5.00pm and 6.59pm
6. After 7.00pm

Q.21 What form of transport would you **usually** use for such a trip?

1. Car
2. Bus
3. Motorcycle
4. Bicycle
5. Taxi
6. Ferry
7. Other (specify).....

Q.22 How long does that trip from home to central Auckland **usually** take?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. More than one hour

Q.23 How long does that trip from home to central Auckland take **on a very slow day**?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. More than one hour

Q.24 What is the principal cause of delay?

.....

more questions over page

Q.25 How satisfied are you with your current mode of travel?

1.	Very dissatisfied	4.	Satisfied
2.	Dissatisfied	5.	Very satisfied
3.	Neither satisfied nor dissatisfied	6.	No opinion

Q.26 What is the reason for your answer to Question 25?

.....

.....

SECTION 3
TRAVEL TO THE NORTH SHORE (DEVONPORT TO ALBANY)

Q.27 For reasons other than work/study, how many times **a month** would you **usually** go to the North Shore?

1.	More than 10	4.	Less than 1
2.	5-10	5.	Never
3.	1-5		

Q.28 What is the **usual** reason for such a trip? (You may circle more than one response)

1.	Sports	4.	Shopping
2.	Movies/restaurants/bars/cafes	5.	Visiting friends/relatives
3.	Work related	6.	Other (specify).....

Q.29 On what days would you **usually** travel?

1.	Weekdays	3.	Both
2.	Weekends		

more questions over page

Q.30 At what time of day do you **usually** travel? (You may circle more than one response)

1. Between 6.30am and 9.29am
2. Between 9.30am and 11.59am
3. Between 12 noon and 2.59pm
4. Between 3.00pm and 4.59pm
5. Between 5.00pm and 6.59pm
6. Between 7.00pm and 7.59pm
7. After 8pm

Q.31 What form of transport do you **usually** use for such a trip?

1. Car
2. Bus
3. Motorcycle
4. Bicycle
5.. Taxi
6. Ferry
7. Other (specify).....

Q.32 How long does that trip from home to the North Shore **usually** take?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. More than one hour

Q.33 How long does the trip from home to the North Shore take **on a very slow day**?

1. Less than 20 minutes
2. 21-25 minutes
3. 26-30 minutes
4. 31-35 minutes
5. 36-40 minutes
6. 41-45 minutes
7. 46-50 minutes
8. 51-55 minutes
9. 56-60 minutes
10. More than one hour

Q.34 What is the principal cause of delay?

.....

more questions over page

Q.35 How satisfied are you with your current mode of travel?

1.	Very dissatisfied	4.	Satisfied
2.	Dissatisfied	5.	Very Satisfied
3.	Neither satisfied nor dissatisfied	6.	No opinion

Q.36 What is the reason for your answer to Question 35?

.....

.....

SECTION 4
FERRY SERVICE

Q.37 How often do you use the Gulf Harbour ferry service to Downtown Auckland?

1.	4 times a week or more	4.	Once a month or less
2.	Between 1 and 3 times a week	5.	Never
3.	Once a fortnight		

Q.38 How likely would you be to use the ferry service if it departed from a location other than Gulf Harbour on the Whangaparaoa Peninsula?

1.	Very likely	4.	Unlikely
2.	Likely	5.	Very unlikely
3.	Neither likely nor unlikely	6.	No opinion

Q.39 What location on the south side of the Whangaparaoa Peninsula would you prefer for a ferry terminal?

1. Gulf Harbour
2. Arkles Bay
3. Other (specify).....

more questions over page

Q.40 How likely would you be to use a ferry service, even occasionally, if it stopped at a North Shore terminal in the vicinity of Browns Bay en route for Downtown Auckland?

1. Very likely
2. Likely
3. Neither likely nor unlikely
4. Unlikely
5. Very unlikely
6. No opinion

Q.41 How likely would you be to use the ferry service, even occasionally, to go to locations in the vicinity of Browns Bay?

1. Very likely
2. Likely
3. Neither likely nor unlikely
4. Unlikely
5. Very unlikely
6. No opinion

Q.42 What factors would lead you to use the ferry service? (You may circle more than one response)

1. Onboard facilities (café, bike carriage, work areas, comfort, good toilets, etc)
2. Frequency of service
3. Reliability
4. Travel time
5. Weather
6. Stopping at other North Shore terminals en route for Downtown Auckland (eg Browns Bay/Devonport)
7. Fare package integrated with other transport services
8. Parking at terminal
9. Transport to and from terminal
10. Price
11. Location of terminal
12. Terminal facilities
13. Other (specify).....
.....

Q.43 Of the above factors, which would be the ***single*** most important to your decision?

1. Onboard facilities (café, bike carriage, work areas, comfort, good toilets, etc)
2. Frequency of service
3. Reliability
4. Travel time
5. Price
6. Stopping at other North Shore terminals en route for Downtown Auckland (eg Browns Bay/Devonport)
7. Fare package integrated with other transport services
8. Parking at terminal
9. Transport to and from terminal
10. Terminal facilities
11. Location of terminal
12. Weather
13. Other (specify).....
.....

more questions over page

Q.44 Which onboard services would make a difference to your choice regarding ferry travel? (you may circle more than one response)

1. Quality food and beverages
2. Free carriage of bicycles
3. Children's area
4. Comfortable seats
5. Fax service
6. Computer workstations
7. Newspapers to be read on board
8. Other (specify).....

Q.45 What is the highest price you would pay for a **daily return** ticket to Downtown Auckland?

1. More than $40
2. $35-$40
3. $30-$34
4. $25-$30
5. $20-$24
6. Less than $20
7. If less than $20, how much would you pay? $.....

Q.46 If you currently use the ferry service or are likely to in the future, how do you or would you be likely to travel to the ferry terminal from your home?

1. Walk
2. Drive own car
3. Cycle
4. Link/shuttle Bus
5. Be dropped off
6. Other (specify).....

Q.47 If you currently use the ferry service to Downtown Auckland or are likely to in the future, how do you or would you travel to your destination once in central Auckland?

1. Walk
2. Cycle
3. Bus
4. Train
5. Taxi
6. Other (specify).....

Q.48 If you would be likely or very likely to use a ferry service to a terminal on the North Shore, in the vicinity of Browns Bay, how do you anticipate you would travel to your final destination from that terminal?

1. Walk
2. Cycle
3. Bus
4. Train
5. Taxi
6. Other (specify).....

more questions over page

Q.49 If you would never use a ferry service from the Whangaparaoa Peninsula to Downtown Auckland or to other locations on the North Shore, please indicate why.

1. Need car during day
2. Safety concerns
3. Services do not go to where I need to go
4. Cost
5. Journey is too long
6. Other (specify).....

SECTION 5 DEMOGRAPHICS

To finish, to ensure we have the opinion of a range of people from your area there are a few questions which are about you.

If there any questions you do not wish to answer, please move on to the next one.

Q.50 What is your gender?

1. Female
2. Male

Q.51 What is your age group?

1. Under 20
2. 20-29
3. 30-39
4. 40-49
5. 50-59
6. 60+

Q.52 Which of the following best describes your ethnic group?

1. New Zealander of Maori descent
2. New Zealander of European descent
3. New Zealander of Pacific Island descent
4. New Zealander of Indian descent
5. New Zealander of Asian descent
6. Other (specify).....

Q.53 What is your occupation?

1. In full time paid employment
2. In part time paid employment
3. Secondary school student
4. Tertiary student (university, tech, etc)
5. Unemployed/beneficiary
6. Retired
7. Household/child care responsibilities
8. Self-employed
9. Other (specify).....

more questions over page

Q.54 What is your annual household income before tax?

1. Under $20 000
2. $20 000 - $39 000
3. $40 000 - $59 000
4. $60 000 - $79 999
5. $80 000 - $99 999
6. $100 000 - $119 000
7. $120 000 or more

Q.55 In which section of the Whangaparaoa Peninsula do you live?

1. From Red Beach to Stanmore Bay
2. From Arkles Bay/ Whangaparaoa to Tindalls Beach
3. From Matakatia Bay to Army Bay/Okoromai Bay

THANKYOU FOR YOUR ASSISTANCE.

PLEASE POST THE COMPLETED SURVEY IN THE PREPAID ENVELOPE PROVIDED.

APPENDIX C

FERRY TRAVEL QUESTIONNAIRE

My name is Juliet Hyatt. I am a postgraduate degree student and am asking for your help with research I am doing into ferry patronage. This research is designed to obtain a greater understanding of the attitude of residents of the Whangaparaoa Peninsula towards travel by ferry to Downtown Auckland and other potential locations on the North Shore and to further knowledge concerning the preferences of travellers for ferry transport. The information will be of interest to those agencies involved in developing these services however it is being collected for my own research purposes, not for Kawau Kat nor any other commercial operator.

As part of my study I am conducting a survey of patrons of the Gulf Harbour – Downtown Auckland ferry service. I would like to find out your views on ferry travel to the North Shore and Downtown Auckland, but you are under no obligation to complete this survey.

If you want to participate in the research, and I hope you will, simply complete the questionnaire and place it the return box on board. It will take about 10 minutes of your time. Your name is not required on the questionnaire and I will treat your reply in confidence. Your responses will be entered into a data file with no identification of who you are. This research has been approved by the Human Ethics committee of Massey University.

I am available during the journey to answer any questions you may have. Please note the separate contact slip at the end of the questionnaire form for your details, to enable me to conduct a follow-up interview by telephone.

If you have any queries or concerns about the research, please do not hesitate to contact me via email to cmrg@massey.ac.nz or by writing to the above address, care of my supervisor Dr Mark Orams, Coastal- Marine Research Group, Massey University at Albany.

With many thanks for your assistance.

Juliet Hyatt
Master of Management student
Massey University at Albany

GULF HARBOUR FERRY USERS QUESTIONNAIRE

A. Ferry Travel

This section asks general questions about your ferry travel behaviour.
Please circle your responses.
If you are unable to answer any question, please move on to the following one.

Q.1. What is the purpose of your ferry trip to Downtown Auckland?

1. Work
2. Shopping
3. Movies/restaurants/bars/cafes
4. Study
5. Visiting friends/relatives
6. Other (specify).....

Q.2 What is your destination once you leave the ferry?

1. Auckland central (within a circle from Ponsonby to Symonds Street to Parnell)
2. Within 5km of Auckland central
3. Other (specify).....

Q.3 How do you travel to that destination once you leave the ferry?

1. Walk
2. Train
3. Cycle
4. Bus
5. Taxi
6. Other (specify).....

Q.4 How do you travel to the ferry terminal from your home?

1. Walk
2. Drive own car
3. Cycle
4. Bus
5. Be dropped off
6. Other (specify).....

Q.5 How often do you use the Gulf Harbour ferry service to Downtown Auckland?

1. 4 times a week or more
2. Between 1 and 3 times a week
3. Once a fortnight
4. Once a month or less

Q.6 What impact does weather have on your travel by ferry?

.....

Q.13 How likely would you be to use the ferry service, even occasionally, to go to locations in the vicinity of Browns Bay?

1. Very likely
2. Likely
3. Neither likely nor unlikely
4. Unlikely
5. Very unlikely
6. No opinion

Q.14 If you would be likely or very likely to use a ferry service to a terminal on the North Shore, in the vicinity of Browns Bay, how do you anticipate you would travel to your final destination from that terminal?

1. Walk
2. Cycle
3. Bus
4. Taxi
5. Other (specify).....

Q.15 What factors have led you to use this ferry service? (You may circle more than one response)

1. Onboard facilities (café, bike carriage, work areas, comfort, good toilets, etc)
2. Frequency of service
3. Reliability
4. Travel time
5. Price
6. Avoidance of traffic
7. Fare package integrated with other transport services
8. Parking at terminal
9. Transport to and from terminal
10. Terminal facilities
11. Location of terminal
12. Weather
13. Other (specify).....

.....

Q.16 Of the above factors, which is the ***single*** most important to that decision?

1. Onboard facilities (café, bike carriage, work areas, comfort, good toilets, etc)
2. Frequency of service
3. Reliability
4. Travel time
5. Price
6. Avoidance of traffic
7. Fare package integrated with other transport services
8. Parking at terminal
9. Transport to and from terminal
10. Terminal facilities
11. Location of terminal
12. Weather
13. Other (specify).....

.....

more questions over page

Q.22 Any other comments you wish to make about ferry travel?

.....

.....

B. NON-FERRY TRAVEL TO CENTRAL AUCKLAND

Q. 23 By means other than ferry, how many times a month would you **usually** go into central Auckland (within a circle from Ponsonby to Symonds Street to Parnell)?

1. More than 10
2. 5-10
3. 1-5
4. Less than 1
5. Never

If you answer "Never" please go to Question 30

Q.24 What is the **usual** reason for such a trip? (You may circle more than one response)

1. Sports
2. Movies/restaurants/bars/cafes
3. Work related
4. Shopping
5. Visiting friends/relatives
6. Other (specify).....

Q25 On what days would you **usually** travel?

1. Weekdays
2. Weekends
3. Both

Q.26 At what time of day would you **usually** travel? (You may circle more than one response)

1. Between 6.30am and 9.29am
2. Between 9.30am and 11.59am
3. Between 12 noon and 2.59pm
4. Between 3.00pm and 4.59pm
5. Between 5.00pm and 6.59pm
6. After 7.00pm

Q.27 What form of transport would you **usually** use for such a trip?

1. Car
2. Bus
3. Motorcycle
4. Taxi
5. Other (specify).....

more questions over page

Q.34 What form of transport do you **usually** use for such a trip?

1. Car
2. Bus
3. Motorcycle
4.. Taxi
5. Other (specify).....

Q.35 How satisfied are you with your current mode of travel?

1. Very dissatisfied
2. Dissatisfied
3. Neither satisfied nor dissatisfied
4. Satisfied
5. Very Satisfied
6. No opinion

Q.36 What is the reason for your answer to Question 35?

.....

.....

D. DEMOGRAPHICS

To finish, to ensure we have the opinion of a range of people there are a few questions which are about you. If there any questions you do not wish to answer, please move on to the next one.

Q.37 What is your gender?

1. Female
2. Male

Q.38 What is your age group?

1. Under 20
2. 20-29
3. 30-39
4. 40-49
5. 50-59
6. 60+

Q.39 Which of the following best describes your ethnic group?

1. New Zealander of Maori descent
2. New Zealander of European descent
3. New Zealander of Pacific Island descent
4. New Zealander of Indian descent
5. New Zealander of Asian descent
6. Other (specify).....

more questions over page

Massey University Human Ethics Committee (MUHEC)
Old Main Building, Turitea
Fax: 64 6 350 5622
http://www.massey.ac.nz/~muhec

Professor Sylvia V Rumball, Chair
Telephone: 64 6 350 5249
Email: S.V.Rumball@massey.ac.nz

Miss Karen A Kahukoti, Secretary
Telephone: 64 6 350 5573
Email: K.A.Kahukoti@massey.ac.nz

Massey University

Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 356 9099

APPENDIX D

30 April, 2003

Ms Juliet Hyatt
[redacted]

Dear Juliet

Re: An investigation into Ferry patronage: A study/survey of Whangaparaoa Peninsula Residents.

Thank you for the MUHEC Checklist and Section A of the MUHEC Application Form that was received on 30 April 2003 and noted by the Chair, Massey University Human Ethics Committee.

As specified in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants, persons who submit the MUHEC Checklist with every question answered with a 'no', together with Section A of the MUHEC Application Form (including a signed Declaration), do not require any further approval and may commence their research.

Yours sincerely

Sylvia Rumball

Professor Sylvia V Rumball, Chair
Massey University Human Ethics Committee

cc Dr Mark Orams
Management & International Business
ALBANY

COPY FOR YOUR INFORMATION

APPENDIX E

[redacted]

30 April 2003

Dear

I refer to my recent telephone conversation with you concerning the research I am conducting for my post graduate degree study at Massey University, Albany.

Please find enclosed a sample questionnaire in draft form for my research into the travel behaviour of the residents of Whangaparaoa Peninsula, focussing particularly on the likelihood of use of a ferry service from Whangaparaoa to Downtown Auckland and possible destinations on the North Shore. The questionnaire, once in its final form, will be sent to approximately 700 residents of the Whangaparaoa Peninsula. Before doing so I am seeking your input as part of a pilot study to test the suitability of the questions being asked.

I should therefore be grateful if you would read the questions carefully and in the margin or at the end of a section comment on the content and style of the questions as well as the format of the questionnaire form itself.

I do appreciate the time you are taking to assist me in this survey. If you have any queries please contact me on:
Ph:[redacted]
Fax: [redacted]
Email: [redacted]

Please return the questionnaire to me in the envelope provided by **9 May at the latest**.

With many thanks

Yours sincerely

Juliet Hyatt

APPENDIX F

Massey University
COLLEGE OF BUSINESS

Department of Management
& International Business -
Albany Campus
Private Bag 102 904,
North Shore MSC,
Auckland,
New Zealand
Telephone: 64 9 441 8115
Facsimile: 64 9 441 8109

22 May, 2003

«TITLE» «FIRST» «SURNAME»
«FLAT_NO»«HSE_NO» «ADDRESS1»
«ADDRESS2» «POSTCODE»

Dear «TITLE» «SURNAME»,

My name is Juliet Hyatt. I am a postgraduate degree student and am writing to ask for your help in research I am doing into ferry patronage. This research is designed to obtain a greater understanding of the attitude of residents of the Whangaparaoa Peninsula towards travel by ferry to Downtown Auckland and other potential locations on the North Shore and to further knowledge concerning the preferences of travellers for ferry transport. The information will be of interest to those agencies involved in developing these services.

As part of my study I am conducting a survey of residents of the Whangaparaoa Peninsula. I would like to find out your views on ferry travel to the North Shore and Downtown Auckland, but you are under no obligation to complete this survey.

How did I get your name and address? Your name and address was randomly picked from the New Zealand electoral roll, which is publicly available. By randomly selecting people, and provided plenty of questionnaires are returned, the research should provide a valid picture of the travel behaviour and preferences of Whangaparaoa Peninsula residents.

What do I need from you? If you want to participate in the research, and I hope you will, simply complete the questionnaire enclosed with this letter and return it in the reply-paid envelope supplied. It will take about 15 minutes of your time. Your name is not required on the questionnaire and I will treat your reply in confidence. Your responses will be entered into a data file with no identification of who you are.

I can offer nothing in return for your participation other than my thanks. If you have any queries or concerns about the research, please do not hesitate to contact me via email to cmrg@massey.ac.nz or by writing to the above address, care of Dr Mark Orams, Coastal- Marine Research Group.

Yours sincerely,

Juliet Hyatt

Supervisor: Dr Mark Orams

APPENDIX G

Massey University
COLLEGE OF BUSINESS

Department of Management & International Business - Albany Campus
Private Bag 102 904,
North Shore MSC,
Auckland,
New Zealand
Telephone: 64 9 441 8115
Facsimile: 64 9 441 8109

9 June, 2003

«TITLE» «FIRST» «SURNAME»
«FLAT_NO» «HSE_NO» «ADDRESS1»
«ADDRESS2»«POSTCODE»

Dear «TITLE» «SURNAME»,

Recently a questionnaire was mailed to you regarding travel behaviour and in particular your attitude towards a ferry service from the Whangaparaoa Peninsula.

If you have already completed and returned the questionnaire, please accept my sincere thanks.

If you haven't yet returned the questionnaire, I hope you will agree to participate in the study and return it as soon as convenient. A replacement questionnaire is enclosed in case the original has been misplaced, together with a Freepost return-addressed envelope (no stamp is required).

To make sure that the results are truly representative of people's opinions, I am keen that as many questionnaires be completed and returned as possible.

If you have any queries or concerns about the research, please do not hesitate to contact me via email to cmrg@massey.ac.nz or by mail to the above address, care of Dr Mark Orams.

Thank you for your help in making this research a success.

Yours sincerely,

Juliet Hyatt

Supervisor: Dr Mark Orams

Age Group and Sex, for the Census Usually Resident Population Count, 1991, 1996 and 2001

Year	2001															
Age Group	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40-44 Years	45-49 Years	50-54 Years	55-59 Years	60-64 Years	65-69 Years	70-74 Years	75-79 Years	80-84 Years	85 Years and Over	Total
Sex	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Area																
Rodney District	4,572	3,036	3,621	5,220	6,204	6,330	5,226	5,244	4,269	3,804	3,276	3,144	2,382	1,548	996	76,182
Red Beach	360	210	243	324	375	426	351	402	294	273	288	318	288	228	198	5,661
Stanmore Bay	540	426	558	774	780	750	525	456	351	327	318	294	225	144	90	8,820
Manly	294	219	231	339	411	438	366	354	360	321	318	348	249	183	87	5,712
Army Bay	96	75	105	192	237	189	138	156	138	138	138	102	60	24	12	2,388
Gulf Harbour	48	18	30	57	78	75	69	90	87	45	36	36	24	9	9	927

APPENDIX H

Main Means of Travel to Work and Age Group, for the Employed Census Usually Resident Population Count Aged 15 Years and Over, 2001

Travel to Work	Worked at Home		Drove a Private Car, Truck or Van		Drove a Company Car, Truck or Van		Passenger in a Car, Truck, Van or Company Bus		Public Bus		Motor Cycle or Power Cycle		Bicycle		Walked or Jogged		Other		Not Stated	
Age Group	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total	15-19 Years	Total
Area																				
Red Beach	0	180	66	1,272	0	330	27	105	21	87	0	12	6	24	15	57	0	9	15	54
Stanmore Bay	3	288	87	2,106	0	606	48	180	45	123	3	24	0	9	21	96	3	15	9	93
Manly	3	198	42	1,158	0	357	21	96	12	72	0	12	3	6	6	60	0	18	6	57
Army Bay	0	102	18	531	0	177	3	30	3	27	0	6	3	6	3	12	0	21	3	18
Gulf Harbour	0	60	6	177	0	69	3	15	3	9	0	0	0	0	3	9	0	12	0	24