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# **Could Airships Make a Comeback?**

Evidence from a Case Study within the Tourism  
Industry of Queenstown, New Zealand

A thesis presented in partial fulfilment of the requirements for the degree of  
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## Abstract

Airships are lighter-than-air (LTA) aircraft that have historically been used for passenger and cargo services. However, since the advent of the Hindenburg Disaster in 1937, their use in civil aviation has been markedly limited. Airships have a number of characteristics that are unique from other aircraft and arguably may generate consumer interest for certain applications. This thesis illustrates that one potentially viable application of airships within civil aviation is scenic flights for touristic purposes. To examine consumer interest in scenic airship services, a mixed-methods approach was employed using Queenstown, New Zealand as a case study. Focus groups were used to explore broad consumer opinions relating to airships, including preferences and concerns. These opinions were quantified using a questionnaire. The focus groups and questionnaire results revealed consumer preferences with regard to activities (e.g. food and drink), airship design (e.g. facilities) and the nature of the experience (e.g. novelty), as well as concerns (e.g. safety). To present a business case, these preferences were used to design two options for a scenic airship service, both using a conceptual airship design called the Aether Concept. The first option was a 3 ½ hour sightseeing tour that incorporated a meal and a drink, while the second option was an all-inclusive overnight service. A market evaluation using these two options revealed significant interest (in terms of pricing and demand) from consumers towards both options as well as the idea of performing adventure activities as part of either option. Consumer justifications for pricing and purchase decisions in the market evaluation were incorporated with the preferences and concerns from the focus groups and questionnaire to form a descriptive model that shows the motivational factors (relaxation, adventure, nature, novelty, quality, enjoyment and education) and mediating factors (location, duration, on-board activities, airship design, risk perception and price perception) that contribute towards consumer interest in scenic airship services. In addition, a new methodology for developing and testing new discontinuous products is presented and demonstrated in this thesis.



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# Table of Contents

<b>Abstract</b> .....	<b>ii</b>
<b>Acknowledgements</b> .....	<b>iv</b>
<b>Table of Contents</b> .....	<b>2</b>
List of Figures .....	4
List of Tables.....	5
<b>1.0 Introduction</b> .....	<b>6</b>
<b>2.0 Literature Review</b> .....	<b>9</b>
2.1. Tourism .....	9
2.2. Airship Design .....	21
2.3. Historical Overview of Airships .....	27
2.4. Potentially Related Industries .....	34
2.5. Discussion.....	37
<b>3.0 Methodology</b> .....	<b>38</b>
3.1. New Product Development.....	38
3.2. Research Design.....	40
3.3. Paradigm.....	41
3.4. Ethics .....	42
3.5. Thematic Analysis.....	42
3.6. Statistical Analysis .....	44
<b>4.0 Phase 1 – Focus Groups</b> .....	<b>50</b>
4.1. Methodology.....	50
4.2. Results.....	52
4.3. Discussion.....	61
<b>5.0 Phase 2 – Questionnaire</b> .....	<b>62</b>
5.1. Methodology.....	62
5.2. Results.....	63
5.3. Discussion.....	69
<b>6.0 Phase 3 – Market Evaluation</b> .....	<b>70</b>
6.1. Methodology.....	70
6.2. Results.....	71
6.3. Discussion.....	81
<b>7.0 General Discussion</b> .....	<b>83</b>
7.1. Activities.....	83
7.2. Airship Design .....	86
7.3. Nature of the Experience .....	89
7.4. Concerns.....	97
7.5. Practical Contribution.....	103
7.6. Methodological Contribution .....	107
<b>8.0 Conclusion</b> .....	<b>110</b>
8.1. Limitations and Possibilities for Future Research .....	111
<b>References</b> .....	<b>112</b>
<b>Appendices</b> .....	<b>130</b>
Appendix A – Airship Model Manufacturers .....	130
Appendix B – Map of Study Location .....	132
Appendix C – Questions and Formats for Questionnaire.....	133

Appendix D – Snapshots of Video Shown to Market Evaluation Participants.....	141
Appendix E – Additional Participant Information .....	148
Appendix F – Airship Information Booklet .....	151
Appendix G – Questionnaire Information Sheet.....	155
Appendix H – Market Evaluation Information Booklet .....	156
Appendix I – Fair Price Determinants .....	158
Appendix J – Determinants for Choosing to Purchase .....	161
Appendix K – Determinants for Choosing Not to Purchase .....	163

## List of Figures

Figure 1. Pre-purchase Information Search Process .....	12
Figure 2. Structural Model of the Tourist Experience .....	16
Figure 3. Peak Tourist Seasons and Meteorological Impacts .....	19
Figure 4. Passengers On-Board a Pre-World War I DELAG Flight.....	28
Figure 5. Comparison of LZ-129 Hindenburg with a Boeing 747-400 .....	29
Figure 6. Servicescape Framework for Leisure Cruises .....	36
Figure 7. Research Design .....	40
Figure 8. Major Design Features by Number of Participants in Favour .....	56
Figure 9. Minor Design Features by Number of Participants in Favour .....	56
Figure 10. Preferred Location for a Scenic Airship Service .....	59
Figure 11. Possible Durations by Number of Participants in Favour.....	59
Figure 12. Questionnaire Participants by Country of Residence .....	64
Figure 13. Questionnaire Participants by Relationship Status and Parental Status.....	65
Figure 14. Market Evaluation Participants by Country of Residence .....	72
Figure 15. Market Evaluation Participants by Relationship Status and Parental Status.....	72
Figure 16. Price-Demand Curve for Option 1.....	73
Figure 17. Price-Demand Curve for Option 2.....	76
Figure 18. Descriptive Model for Deriving Consumer Interest in Scenic Airship Services .....	104
Figure 19. Proposed Methodology for Developing and Testing New Discontinuous Products.....	108
Figure 20. Detailed Map of Location for Questionnaire and Market Evaluation Administration.	132
Figure 21. Gender Questions .....	136
Figure 22. Numerical Questions.....	136
Figure 23. 'Yes' or 'No' Questions.....	137
Figure 24. Nominal Multiple Choice Questions .....	137
Figure 25. Likert Multiple Choice Questions .....	138
Figure 26. Ranking Questions .....	138
Figure 27. Slider Questions .....	139
Figure 28. Short Qualitative Questions .....	139
Figure 29. Long Qualitative Questions .....	140
Figure 30. Snapshot of Takeoff.....	141
Figure 31. Snapshot of Lobby 1 .....	141
Figure 32. Snapshot of Lobby 2 .....	142
Figure 33. Snapshot of Dining Area 1 .....	142
Figure 34. Snapshot of Dining Area 2 .....	143
Figure 35. Snapshot of Bar .....	143
Figure 36. Snapshot of Kitchen.....	144
Figure 37. Snapshot of Bedroom 1 .....	144
Figure 38. Snapshot of Bedroom 2 .....	145
Figure 39. Snapshot of Bedroom 3 .....	145
Figure 40. Snapshot of Bedroom 4 .....	146
Figure 41. Snapshot of Airship In-Flight .....	146
Figure 42. Snapshot of Landing.....	147

## List of Tables

Table 1. Factors and Scale Items for a Memorable Tourism Experience.....	15
Table 2. Assessment of Airship Design Categories in Realising Airship Attributes.....	22
Table 3. Comparison of Various Airship Models .....	24
Table 4. Zeppelin NT Pricing Structure on 26 April 2016 .....	33
Table 5. Checklist for a Good Thematic Analysis.....	43
Table 6. Questionnaire Results.....	67
Table 7. Ranking Order of Major Design Features with Z-values .....	69
Table 8. Key Determinants of Fair Price for Option 1 .....	74
Table 9. Key Determinants for Choosing to Purchase Option 1.....	75
Table 10. Key Determinants of Fair Price for Option 2 .....	77
Table 11. Key Determinants for Choosing to Purchase Option 2.....	78
Table 12. List of Focus Group Participants, Categorised by Gender, Age and Nationality.....	148
Table 13. Questionnaire Participants by Country of Residence .....	149
Table 14. Market Evaluation Participants by Country of Residence .....	150
Table 15. Determinants of Fair Price for Option 1 with Explanations, Number of Participants, Percentage of Participants and Rank.....	158
Table 16. Determinants of Fair Price for Option 2 with Explanations, Number of Participants, Percentage of Participants and Rank.....	159
Table 17. Determinants for Choosing to Purchase Option 1 with Explanation, Number of Participants, Percentage of Participants and Rank .....	161
Table 18. Determinants for Choosing to Purchase Option 2 with Explanation, Number of Participants, Percentage of Participants and Rank .....	162
Table 19. Determinants for Choosing Not to Purchase Option 1 with Explanation, Number of Participants, Percentage of Participants and Rank .....	163
Table 20. Determinants for Choosing Not to Purchase Option 2 with Explanation, Number of Participants, Percentage of Participants and Rank .....	163

## 1.0 Introduction

Airships are lighter than air (LTA) controllable aircraft. They can be separated into two main categories: dirigibles and blimps. Dirigibles use rigid aluminium frames to embrace several gas cells and anchor the engine pods and cabin to the aircraft (Nalty, 1999). With blimps the shape of the aircraft is maintained by internal pressure, typically resulting in blimps being smaller than dirigibles (Nalty, 1999). Airships are capable of maintaining lift without consuming energy, which provides for endurance, less fuel burn, the ability to take off vertically and the capability of hovering in place (Recoskie, Fahim, Gueaieb & Lanteigne, 2013). Furthermore, overall operating costs are lower for LTA aircraft than fixed wing or rotary wing aircraft when worked out as a function of payload, hours and distance travelled (Recoskie *et al.*, 2013). Pant (2010) also notes that airships do not need to be pressurised and allow for luxurious space, that airships are flexible and safer when handling safety hazards such as bird strikes and minor hits into objects and that airships are environmentally friendly due to their low noise and emission outputs. Airships, however, are much slower than other aircraft types (Hillsdon, 2012).

A tourist experience can be defined as “an individual’s subjective evaluation and undergoing of events related to his/her tourist activities which begins before, during and after the trip” (Tung & Ritchie, 2011, p. 1369). Whilst this definition is useful for capturing the essence of tourism experiences, it is the opinion of the authors and is not empirically validated. The key idea that this opinion represents is that tourism experiences are not one-size-fits-all services and depending on how the tourist experience is designed, marketed, delivered and followed up, only certain consumers will consider these experiences as memorable. The characteristics of operational efficiency, luxurious cabin design, safety and slow speeds make airships unique from other aircraft. Accordingly, it is not known how these unique characteristics might influence the memorability of tourist experiences. Airships have not been used for scenic tourism purposes in recent times and have seldom been used for passenger services since the

Hindenburg Disaster of 1937 (Hillsdon, 2012). In absence of any service offering, there is a total absence of information relating to the market characteristics of scenic airship services.

It is possible that the absence of any airship service offering is due to past misrepresentations about the safety of airships. Contrary to popular belief, airships are not innately unsafe because they are filled with hydrogen or helium. This misbelief stems from the Hindenburg Disaster, which was falsely attributed to a hydrogen ignition in the initial investigation (see Bureau of Air Commerce, 1937). According to more recent scientific studies, the disaster was caused by the fabric and paint used to make the Hindenburg rather than any inherent problems with the gases used or other features of airship design (Bain & van Vorst, 1999; Rigas & Sklavounos, 2005). It has been suggested that this misattribution of cause has precluded the use of airships for passenger services because people have a phobia of hydrogen (Bain & van Vorst, 1999). There is no data to substantiate this claim, however, it seems reasonable at face value (e.g. there is a movie about the Hindenburg disaster). Notably, most modern airships use the inert and incombustible helium gas for lift (Bain & van Vorst, 1999). Helium, however, is significantly more expensive (Baughman, 2013), which suggests that there may be value derived from research into consumer perceptions about the safety of airships.

Queenstown is a city in the South Island of New Zealand that is proximate to a number of scenic areas (Destination Queenstown, 2013). By 2012 figures, the Queenstown-Lakes tourism industry accounts for 34.1% of the region's employment (5,171 people) and 24.6% of the region's GDP (\$NZ265.9 million) (Leung-Wai, 2013). It is clear that seasonality exists as a factor in the Queenstown tourism industry with international tourists peaking in December/January and July/August and domestic tourists peaking in January, July and April (Leung-Wai, 2013). Operational difficulties exist with air travel in Queenstown due to mountainous terrain, changeable weather and a high density of air traffic (CAANZ, 2012). Despite these difficulties, Queenstown airspace is used for a number of aviation activities including scheduled airline services,

scenic flights, aerobatic flights, flight training, helicopter flights, balloon flights, hang gliding, paragliding, gliding and parachutes (CAANZ, 2012). Due to the variety of existing aviation activities and the importance of tourism in Queenstown, it is a logical place for a case study on the use of airships for scenic tourism. It should be noted that the purpose of this case study is to find general principles, rather than Queenstown-specific aspects.

This study commences with the premise that there are no major safety concerns that preclude airships from reintroduction to passenger services. Queenstown is chosen as the focus of the study as it is a major tourist hub and has a number of scenic locations nearby. To date, there has been no research that has examined whether there is interest in scenic airship services or consumer preferences that might influence interest levels. As has been discussed, memorable experiences are subjective and this study aims to: (1) identify the kind of subjective factors might make a scenic service more memorable and (2) ascertain whether there is interest LTA scenic tourism as a memorable experience. Specifically, this study aims to answer the following questions:

- 1. Is there consumer interest in scenic airship services within the Queenstown tourism market?*
- 2. What consumer preferences influence interest in such a service?*

## **2.0 Literature Review**

### **2.1. Tourism**

Tourism can be defined as a construct with “significant psychological, social and economic differences from other, similar behaviour during which people leave and return to home” (Gnoth, 1997, p. 283). In this sense, the way that people behave as part of a tourism market is different to how they may behave in other markets.

#### **2.1.1. Decision Making within Tourism**

In early tourism research, ‘push’ and ‘pull’ factors were used to explain what makes tourists travel (Crompton, 1979; Dann, 1977). Push factors (e.g. culture, people, landscape) are those that predispose a tourist to travel. Pull factors (e.g. amenities) are those that attract a tourist to a particular place/activity/resort and whose value is seen to reside in the object of travel. This conceptualisation of tourist motivation for travel in terms of push and pull factors is still used today (Chen & Chen, 2015; Kim, Lee & Klenosky, 2003; Prayag & Ryan, 2010).

The push and pull factor model was developed in the psychological era of behaviourism. Accordingly, it treats motivational factors as objective and rational. Taking the cognitivist point-of-view, this paper would argue that there are a number of subjective and irrational aspects of motivation that cannot be explained by this model alone. This argument was also used by Gnoth (1997) to justify enhancing the use of push and pull factors by separating motivation into two dimensions: motives and motivations. Motives are broad and generic and while implying a direction and target, do not necessarily specify one (Gnoth, 1997); for example, “I want to take a break away from home”. Motivations are different in that they include a clear objective or target, usually based upon the individual’s objective situation (temporal, spatial and economic) and subjective situation (values and expectations); for example, “I am taking a break in Australia because it is affordable and I think it will be a relaxing experience”.

This enhancement of the push and pull factor model is given further credence by a study from McCabe (2000), which showed visitors to a national park in England had engaged in a two-stage decision-making process prior to going to the national park. Data analysis showed that this process involved both motives and motivations.

It is important to understand the difference between a tourist destination and a tourist product. A tourist destination is a geographic location where a tourist product is consumed or experienced, whereas the tourism product is either an attraction or activity, an amenity, or accessibility to a destination or product (Collier, 2006). Attractions can be separated into one of four different categories: (1) natural attractions; (2) man-made attractions built for other purposes than attracting tourists; (3) man-made attractions built to attract tourists; and (4) special events (Swarbrooke, 1995). While a scenic airship service may incorporate looking at attractions, it would be better classified as an activity. Becken and Simmons (2002) separate tourist activities into the following categories: (1) air activities, such as scenic flights; (2) motorised water activity, such as diving or whale watching; (3) adventure recreation, such as kayaking or bungy jumping; and (4) nature recreation, such as cycling or golf. Accordingly, tourists will evaluate a scenic airship service in terms of their trip planning as this is what usually happens for tourist activities (Rao, Thomas & Javalgi, 1992).

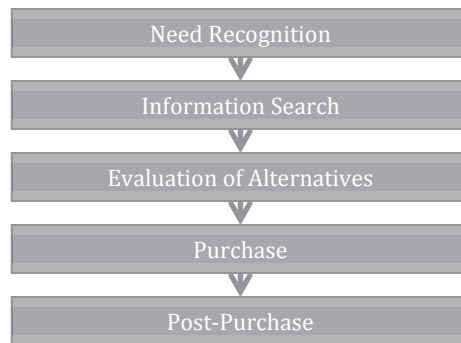
Tourists demand to be able to design and book personalised tourist packages, including a mixture of attractions and activities in their itineraries (Tsiotsou, Ratten & Sigala, 2010). This process is called travel planning. The idea of travel planning differs from single goal decision-making because a travel plan usually involves multiple, sequential and interrelated goals (Stewart & Vogt, 1999). This means that it can be difficult to classify motivational factors and mediating factors for wanting to undertake tourist activities. Furthermore, travel planning is complicated by the fact that many travel plans are never actually realised by the tourist upon arrival (March & Woodside, 2005). In other words, goals change and some activities that are attractive when booking travel, are no longer attractive when the travel experience is underway. Two travel planning

processes begin prior to travel, including travel information search and travel product purchasing (Jun, Vogt & MacKay, 2007).

Tourists go through a process of information search before they purchase a tourism service. This is called the pre-purchase information search (Xiang & Gretzel, 2010). This is of interest to this study because tourists would evaluate the attributes of a scenic airship service prior to paying for its services. Generally, the process begins with tourists (consumers) recognising that they have a need to be fulfilled (Bruner & Pomazal, 1988; Roozmand *et al.*, 2011). The recognition of need is what provides the 'motive' discussed under Gnoth's (1997) model. After tourists recognise their needs, they begin searching for decision-relevant information on satisfactory alternatives to meet their needs.

The decision-relevant information search can be separated into internal information search, where the consumer searches for information from their long-term memory and external information search, where the consumer searches from other sources, such as word-of-mouth, marketing material and online media (Crotts, 1999). The information collected in the earlier phase will then be used to evaluate between alternatives (Solomon, Bamossy, Askegaard & Hogg, 2010). The choice between alternatives depends upon the objective and subjective situations of the consumer that provide 'motivations' towards a particular alternative (Gnoth, 1997). A purchase may then take place and the consumer will then go through the post-purchase phase (Roozmand *et al.*, 2011). Of interest to this study in terms of the pre-purchase information search are the aspects that influence consumer interest in a scenic airship service prior to purchasing the service.

**Figure 1. Pre-purchase Information Search Process**



*Source: Solomon et al. (2010)*

Because scenic airship services do not currently exist, it is unclear what motives and needs would lead tourists towards their use. Furthermore, the objective and subjective situations of tourists and how these would interact with motives and needs to motivate tourists towards a scenic airship service (as opposed to alternatives) also remains unclear. The categorisation of potential motives and motivations that may lead towards tourists deciding to fly on a scenic airship service is of interest to this study.

The models discussed above (see Figure 1) are examples of decision modelling. Decision models assume causality between inputs and outputs and often lack empirically grounded predictability (Ehrenberg, Barnard & Sharp, 2000). The fundamental problem with models for consumer decision making is that they are based on rational maximising to describe how consumers should choose, whereas they are often claimed to describe how consumers do choose (Thaler, 1980). These explanations and predictions of how consumers make decisions are therefore argued by decision models to be based upon human rationality. However, there are grounds for questioning human rationality as a concept. For example, Tversky and Kahneman (1981) found that sometimes when people are presented with the same problem and contingencies within a different frame (i.e. put differently) they change their mind as to which is the best contingency to choose. This contradicts the rational principle of invariance. An 'endowment effect', where consumers demand much more to give something up than what

they would pay for it is another anomaly of human rationality (Kahneman, Knetsch & Thaler, 1991; Knetsch, 1989).

Humans also seem to have a disproportionate tendency to maintain status quo, avoiding the purchase or sale of items where this will affect their current status (Samuelson & Zeckhauser, 1988). Endowment effect and status quo bias are both related to a the theory of loss aversion, which is when humans feel that the disutility of giving up an object is greater than the utility associated with acquiring it (Kahneman & Tversky, 1984). The theory of loss aversion has been shown to be a robust effect and not unique to any one market setting (Bateman, Munro, Rhodes, Starmer & Sugden, 1997). Market experience, defined by how long a person has been part of a market, has been shown to mediate consumers' tendencies towards loss aversion, where more experienced consumers are less averse to loss (List, 2003). Potentially this means that in a new market, such as scenic airship services, where all the consumers are new, the effect of loss aversion may be exacerbated. It has also been shown that the gap between willingness to pay and willingness to accept that is the premise of the theory of loss aversion may also be able to be explained by the absence of certain controls in experiment conditions (Plott & Zeiler, 2005).

The alternative is to use descriptive models, which simply aim to depict actual or potential marketing knowledge and apply it, usually looking at marketing-mix factors separately instead of making an overall model (Ehrenberg *et al.*, 2000). In this sense, human rationality is no longer an assumption. The end result tends to be general principles about a certain market. For example, Chen and Chang (2003) created a descriptive model of the online shopping process based upon empirical data that they had collected. The descriptive model identified the common online shopping components as being interactivity, transaction and fulfilment. These are general principles that were observed within their data, rather than predictions that assume human rationality. This study will take a descriptive approach and try to classify general principles about what is important to consumers with regard to scenic airship services.

### **2.1.2. Tourist Experiences**

Tourist experiences can be defined as “an individual’s subjective evaluation and undergoing (i.e. affective, cognitive and behavioural) or events related to his/her tourist activities which begins before (i.e. planning and preparation), during (i.e. at the destination) and after the trip (i.e. recollection)” (Tung & Ritchie, 2011, p. 1369). This is consistent with Cohen, Prayag and Moital (2014) categorising tourist behaviour into three categories: pre-visit, on-site and post-visit. Tung and Ritchie’s (2011) definition shows that there is no one-size-fits-all approach to creating a memorable tourist experience as tourist experiences are evaluated subjectively, rather than objectively. Accordingly, Tung and Ritchie (2011) argued that the role of providers of tourist activities should be to facilitate tourists in developing an environment that enhances the likelihood of the tourists creating their own memorable tourism experiences. Kim, Ritchie and McCormick (2012) also developed a scale to measure memorable tourism experiences using a confirmatory factor analysis. The factors and scale items are shown in Table 1.

It will be useful to compare results about consumer preferences that would make a scenic airship service memorable against this more generic framework. However, these aspects only contribute to a memorable tourist experience. Other experiential aspects that contribute towards the perceived value of a tourist experience are: (1) the authenticity of the interaction between the environmental and the people-based experiences (Pearce & Moscardo, 1986; Wang, 1999); (2) social and emotional value (Colton, 1987); (3) the behaviour of other tourists (Graefe & Vaske, 1987); (4) intrinsic comparison with ideal, equitable, minimum and expected standards (Vittersø, Vorkinn, Vistad & Vaagland, 2000); and (5) social and physical encounters, i.e. interactions with the service provider, other consumers and the servicescape (Prebensen & Foss, 2011).

**Table 1. Factors and Scale Items for a Memorable Tourism Experience**

<b>Factors</b>	<b>Scale Items</b>
Hedonism	<ul style="list-style-type: none"><li>• Thrilled about having a new experience</li><li>• Indulged in the activities</li><li>• Really enjoyed this tourism experience</li><li>• Exciting</li></ul>
Novelty	<ul style="list-style-type: none"><li>• Once-in-a lifetime experience</li><li>• Unique</li><li>• Different from previous experiences</li><li>• Experienced something new</li></ul>
Local Culture	<ul style="list-style-type: none"><li>• Good impressions about the local people</li><li>• Closely experienced the local culture</li><li>• Local people in a destination were friendly</li></ul>
Refreshment	<ul style="list-style-type: none"><li>• Liberating</li><li>• Enjoyed sense of freedom</li><li>• Refreshing</li><li>• Revitalised</li></ul>
Meaningfulness	<ul style="list-style-type: none"><li>• I did something meaningful</li><li>• I did something important</li><li>• I learned about myself</li></ul>
Involvement	<ul style="list-style-type: none"><li>• I visited a place where I really wanted to go</li><li>• I enjoyed activities which I really wanted to do</li><li>• I was interested in the main activities of this tourism experience</li></ul>
Knowledge	<ul style="list-style-type: none"><li>• Exploratory</li><li>• Knowledge</li><li>• New culture</li></ul>

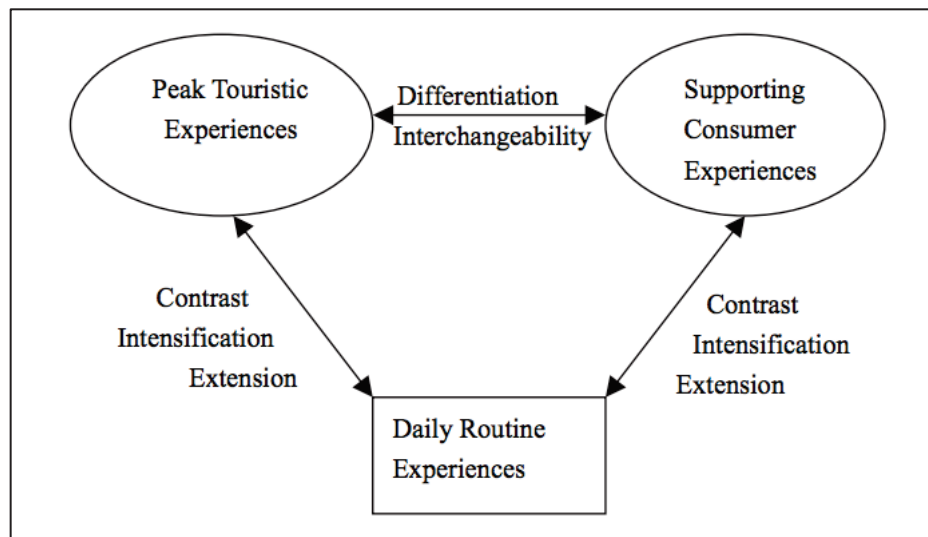
*Source:* Kim et al. (2012)

Satisfaction with a tourist experience has been shown to be a four-stage process: (1) performance quality, determined by ambiance, amenities and comfort; (2) experience quality, determined by entertainment, education and community; (3) overall satisfaction, determined by the former two stages; and (4) revisit intentions, determined by overall satisfaction (Cole & Scott, 2004). In this sense, tangible aspects (performance quality) of the tourist activity also influence the tourist experience, emphasising the importance of studying both the physical and the psychological preferences of consumers.

In the past, tourist experiences have been understood as the ‘peak’ experience (i.e. the attraction itself), but as tourists increasingly demand a higher quality of services, ‘secondary’ or ‘supporting’ experiences (e.g. food and hospitality) have increasingly caught the attention of researchers (Mossberg, 2007; Okumus, Okumus & McKercher, 2007; Quan & Wang, 2004). Accordingly, Quan and Wang

(2004) propose a structural model of the tourist experience that is useful for understanding the relationship between secondary experiences, such as food and the core experience of the sightseeing in an airship. This model is shown in Figure 2.

**Figure 2. Structural Model of the Tourist Experience**



Source: Quan and Wang (2004)

This model identifies the interchangeability between the peak touristic experience and the supporting consumer experiences. It also identifies that both of these aspects can be differentiated to improve the daily experience of consumers.

### 2.1.3. Nature-based Tourism

Scenic airship services may be encompassed within the category of nature-based tourism. This has been defined as “tourism in natural settings (e.g. adventure tourism), tourism that focuses on specific elements of the environment (e.g. safari and wildlife tourism, nature tourism, marine tourism) and tourism that is developed in order to conserve or protect natural areas (e.g. ecotourism, national parks)” (Hall & Boyd, 2005, p. 3). Airships for the purposes of scenic tourism could be considered as nature-based in the Queenstown tourism market because they would focus on scenery that is part of the environment. The

hypothesis is that they would need to focus on natural settings and specific elements of the environment. To a lesser extent, they may also help conserve the natural environment of the area due to having lower emissions than more conventional transport (Pant, 2010; Recoskie *et al.*, 2013). In this sense, scenic airship services could be defined as competing within the scenic tourism, nature-based tourism, adventure tourism and/or ecotourism market segments.

One transport mode for scenic tourism is self-drive road transport across scenic highways. For example, Queenstown has several scenic highways within a close distance. Notably, State Highway 94, which tourists could take to drive to Milford Sound; State Highway 6, which tourists could take to Arrowtown and Wanaka; and Crown Range Road, a mountain pass that tourists could take for scenic purposes and to visit Cardrona. A study by Denstadli and Jacobsen (2011) investigated motivation for tourists to travel on two different scenic highways within Norway. The results of this study showed that the three highest rated motives for tourists in this segment were beautiful views, interesting landscapes and natural attractions. These were categorised into 'visual experiences' using a total factor analysis. This study showed that those who were categorised into being motivated primarily by visual experiences did not desire quick passage, but rather the opposite, slow travel. It may be that slow speed travel will also be what are desired from tourists in the Queenstown tourism market, allowing them to take in "visual experiences" with greater ease. If so, this could be seen as a competitive advantage for airships in relation to other faster means of transportation (e.g. airships usually cruise at 30 to 105 knots, compared with light aircraft which usually cruise at 200 knots). It does raise the issue, however, of consumers trading off between the potentially low prices of renting cars and the added luxury (and likely cost) that would ensue with a scenic airship service (for example, a 1-hour heritage flight on the Zeppelin NT costs €425).

Nature-based tourism businesses are often small and are subject to seasonality in supply as well as restrictions on resource use (from landowners or government) (Fredman & Tyrväinen, 2010). One of the most fundamental parts of a successful nature-tourism business is access to natural resources (e.g. lakes,

mountains, forests, etc.) that are attractive enough for demand for travel and tourism to occur (Lundberg & Fredman, 2011). The access to these resources and their apparent attractiveness in the eyes of consumers are dependent upon the support of external stakeholders such as landowners, public agencies, non-profit organisations and local communities (Lundberg & Fredman, 2011). Essentially this means that the success and feasibility of a scenic airship service would be dependent upon several factors that are not controllable, including seasonal variations to weather and demand, access to natural resources and support from external stakeholders.

#### **2.1.4. Potential Barriers**

This section looks at some potential barriers for offering a scenic airship service that would need to be overcome. As each location has a specific context, Queenstown is used to illustrate the kind of barriers that might be present.

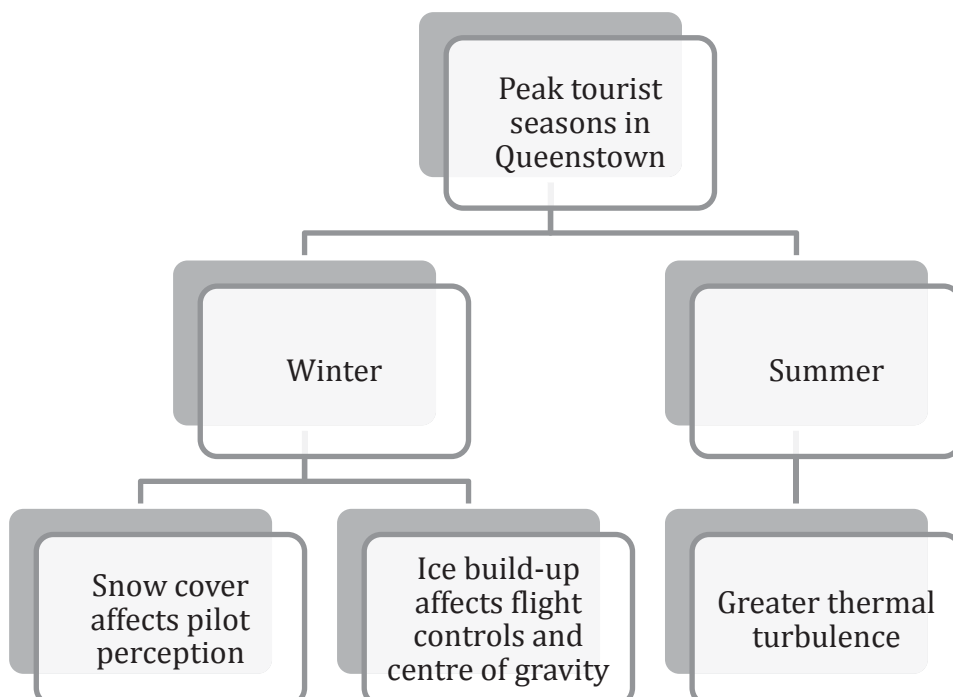
##### **2.1.4.1. Seasonality**

This section demonstrates two major impacts of seasonality: (1) bad weather can make scenic airship flights become less enjoyable and potentially unsafe; and (2) seasonality (seasonal patterns) can influence the number of tourists that visit a location, thus influencing demand for tourist activities. These variables can interplay in that certain seasons produce less desirable weather than others.

Using Queenstown as an example, there are large variances between seasons in terms of visitor numbers. International tourists visit most frequently in December/January and July/August and domestic tourists visit mostly in January, April and July (Leung-Wai, 2013). This means that the two major peak periods are in summer (December/January) and winter (June/July). According to the National Institute of Water and Atmospheric Research (NIWA) (2013), the region has low mean annual rainfalls, often with long dry spells during summer. Winter, however, suffers from severe frosts and occasional snowfall. Wind is not usually severe in Queenstown, although strong winds are rarely experienced from the northwest.

Snowfall and freezing temperatures are a concern for airship operations. When the hull of the airship is below 0°C, both rain and wet snow can freeze upon contact with the envelope of the structure and add weight to the airship in short amounts of time (Harris, 2012). Even if no precipitation is present, suspended super-cooled droplets of atmospheric moisture can also freeze upon contact with the airship's hull. Such build up can be more severe as glazed ice tends to accrete in critical areas of the airship, such as the engine air inlets, windscreen of the gondola, external air speed sensors, external valves and air scoops, all external cable runs and antennae and selective areas of the moving flying control surfaces (Harris, 2012). Because there is often no cloud cover when it is not precipitating, the sun may prevent the building up of ice on just one side of the airship, leading to asymmetric loads on the airship's flight envelope (Harris, 2012). The heat of summer exacerbates the normal thermal turbulence that would be expected around mountainous terrain (CAANZ, 2012). Because winter and summer are peak seasons for tourists in Queenstown, scenic airship services would need to be available at these times. However, while not preventing a service from operating, there are some potentially major safety considerations that must be addressed because of the undesirable meteorological conditions that occur during these seasons (see Figure 3).

**Figure 3. Peak Tourist Seasons and Meteorological Impacts**



#### **2.1.4.2. Cultural Barriers**

Using Queenstown as an example, one might find that there are cultural barriers that exist that could potentially prevent a scenic airship service from operating. A New Zealand specific example is restrictions from Iwi with respect to their rights under the Treaty of Waitangi (Maori: Te Tiriti o Waitangi). The Treaty of Waitangi is considered as New Zealand's founding document and sets forth the respective rights of Pākehā (a broad Maori term referring to people of European descent) and Māori (Network Waitangi, 2015). One of the key problems with the Treaty of Waitangi is the difference between the English and Māori texts, where the English text states that the Governor General of New Zealand would exercise sovereignty over both Māori and Pākehā, whereas the Māori text states that the local Māori tribes (or Iwi) would allow a governor to exercise sovereignty over the Pākehā that had settled in New Zealand outside of the law (Network Waitangi, 2015). In respect of this difference, the Waitangi Tribunal (the court that deals with claims under the Treaty of Waitangi) sometimes grants governance rights back to Māori tribes.

One Treaty of Waitangi example pertinent to the Queenstown area is the settlement the Crown made with Ngāi Tahu (the local Iwi) under the Ngāi Tahu Claims Settlement Act (1998). In this settlement Ngāi Tahu were given guardianship rights over substantial areas of the environment of South Island due to the historical cultural significance of these areas to the Ngāi Tahu. The result is that Ngāi Tahu currently own three tourist ventures within the South Island (one in Queenstown) and are able to exercise unique freedoms over areas of land, water and mountains within the area. Because of their guardian status, they may also be able to restrict access to certain locations unless financial reparations are made with Ngāi Tahu in exchange for access.

#### **2.1.4.3. Other Barriers**

If airship services were to take place, approval would be required from the Civil Aviation Authority of New Zealand (CAANZ) as well as resource consent from the local council. Discussion of these barriers is beyond the scope of this thesis.

## **2.2. Airship Design**

### **2.2.1. Airship Models**

One of the important aspects of this research is deducing consumer preferences with regard to the design of a scenic airship service. The duration of a service, the location, the level of service available and the price of the service are all dependent upon the airship model. Furthermore, the appearance of an airship as either a 'traditional' design or a 'modern/alternative' design may have some influence on consumer interest. These fixed characteristics of various airship models must be considered in any market research into the viability of offering a scenic airship service. This study aims to combine the characteristics of airship models with consumer preferences in order to assess the most viable airship models for servicing the case study market (Queenstown, New Zealand). Consumer preferences are restricted by what is physically possible with airships.

In terms of economics and role consideration, there are three broad categories of airship, which vary based upon their level of lift augmentation (Hillsdon, 2012). The first category consists of airships that use no lift augmentation. These use propulsion that is in line with their latitudinal axis and require changing the incidence of the hull to generate lift. Their maximum certified take-off weight is displaced by their static gas lift. The second category consists of airships that use partial lift augmentation. These have thrust lines that vary at will to provide a vertical component of thrust and avoid the need to change the incidence of the hull to provide lift. These thus allow for hovering and vertical take-offs, but require power to maintain lift (i.e. the static lift does not entirely displace the weight of the aircraft and its load). The third category consists of airships that use total lift augmentation. These airships are totally supported by direct powered lift and the buoyant lift of the gas only supports the airship's empty weight. Table 2 summarises Hillsdon's (2012) assessment of the capability of these three categories of airships.

**Table 2. Assessment of Airship Design Categories in Realising Airship Attributes**

<b>Attribute</b>	<b>No lift augmentation</b>	<b>Partial lift augmentation</b>	<b>Total lift augmentation</b>
Endurance	Excellent	Excellent	Fair
Speed	Fair	Fair	Fair
Altitude	Poor	Poor	Poor
Cabin Environment	Very good	Very good	Fair
Payload	Very good	Very good	Very good
Operating costs	Very good	Very good	Fair
Safety	Good	Excellent	Good

*Source: Hillsdon (2012)*

Accordingly, it would seem that partial lift augmentation is the best type overall for the purposes of scenic tourism. This is because they are innately safer than airships that use no lift augmentation. No lift augmentation is, however, a much cheaper style of design (Hillsdon, 2012). Models that use total lift augmentation are not viable options because they have higher operating costs, less desirable cabin environments, lower ranges and suffer from safety downfalls. Thus, only airships that use partial or no lift augmentation will be considered as part of this study.

Certain considerations of the local area must also be taken into account with regard to scenic airship services. For example, an interview with Arindam Banerjee, Senior Tutor in navigation at Massey University’s School of Aviation revealed that due to the strong updrafts and downdrafts and sudden changes in temperature experienced in mountain regions, any airships operated in Queenstown as part of a scenic airship service would have to have a minimum ceiling of around 25,000 feet. This means that in reality a number of existing designs would not be able to serve the Queenstown tourism market. However, if a flat scenic region was to be served, much lower ceilings would be acceptable. The general principle is that consumer preferences might need to be restricted to those that are safe and physically possible.

A list of current airship manufacturers and designers compiled from databases of the Airship Association (2015) and (Airshipmarket, 2014) are shown in Appendix A – Airship Model Manufacturers. Airship models that could viably carry five or more passengers (excluding pilots) are compared in Table 3.

In addition to the airship models shown in Table 3, another concept has been released by a designer called Mac Byers, who designed the Aether Airship Concept as part of his studies at the University of Huddersfield.<sup>1</sup> While no technical information is readily available about the design, his concept is different from the other airship models in that there are a number of facilities built into the design such as a dining area, a kitchen, a bar, private bedrooms and a spacious cabin area (Byers, 2013). It will also be considered, acknowledging that its technical information cannot be compared with the other models on offer.

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<sup>1</sup> Permission was sought to use Mac Byer's design as part of this study.

**Table 3. Comparison of Various Airship Models**

	VWAG A-150	VWAG A-170LS	SVAM CA-150	GEFA-FLUG AS 105 GD-6	HAV Airlander 10	HAV Airlander 50
Capacity	9 adults	9 adults	8 adults	5 adults	10000kg cabin	50 adults + 60000kg
Cruise Speed	40 knots	38 knots	43 knots	N/A	80 knots	105 knots
Max Speed	52 knots	45 knots	46 knots	19 knots	Unknown	Unknown
Lifting Gas	Helium	Helium	Unknown	Hot air	Helium	Helium
Airship Type	No lift augmentation	No lift augmentation	No lift augmentation	No lift augmentation	Partial augmentation	Partial lift augmentation
Airship Size (Length x Width x Height)	165 x 46 x 44 feet	178 x 46 x 55 feet	157.5 x 12.64 x 14.35 feet	159.4 x 48.5 x 14.35 feet	302 x 143 x 85 feet	390 x 196 x 115 feet
Cabin Size (Length x Width x Height)	11.4 x 5 x 6.3 feet	11.4 x 5 x 6.3 feet	19.4 x 5.25 x 5.75 feet	Unknown	Dependent upon operator's design	Dependent upon operator's design
Ground Crew	16	18	9	Unknown	Unknown	Unknown
Range	Unknown	Unknown	2000km	Unknown	Unknown	3500km
Payload	Unknown	Unknown	1469kg	Pilot + 450kg	10000kg	60000kg
Ceiling	Unknown	Unknown	9000 feet	9000 feet	20000 feet	10000 feet
Endurance	Unknown	Unknown	25 hours	2 hours	5 days	4 days
Toilet	Unknown	Unknown	Unknown	No	Yes	Yes
Cost	Unknown	Unknown	Unknown	€279,000	Unknown	Unknown

	Lockheed-Martin P-791	RosAeroSystems Au-30	Skyship 600	WDL - 1B	Zeppelin NT	Sky SkyPalace SL 150	Lifter
Capacity	19 adults + 21000kg	8 adults	18 adults	6 adults	14 adults	800 adults	
Cruise Speed	60 knots	43 knots	43 knots	Unknown	Unknown	43 knots	
Max Speed	Unknown	54 knots	60 knots	57 knots	62 knots	Unknown	
Lifting Gas	Helium	Helium	Helium	Helium	Helium	Helium	
Airship Type	Partial lift augmentation	No lift augmentation	No lift augmentation	No lift augmentation	Partial lift augmentation	Partial lift augmentation	lift
Airship Size (Length x Width x Height)	Unknown	177 x 44.3 x 59 feet	Unknown	198 x 54 x 63 feet	246 x 57 x 63 feet	450 x 450 x unknown feet	x
Cabin Size (Length x Width x Height)	Dependent upon operator's design	Unknown	Unknown	Unknown	35 x 7.5 x 8.2 feet	5 story cylindrical building	
Ground Crew	0	4 - 6	Unknown	Unknown	3	Unknown	
Range	2592km	1600km	Unknown	1680km	1000km	2000km	
Payload	21000kg	1400kg	Unknown	1500kg	2350kg	Unknown	
Ceiling	Unknown	8200 feet	8000 feet	6500 feet	9850 feet	10000 feet	
Endurance	4 days	24 hours	24 hours	24 hours	24 hours	Unknown	
Toilet	Yes	Unknown	Yes	Unknown	Yes	Yes	
Cost	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	

Sources: (Airshipmarket, 2015; GEFA-FLUG, 2015; Hybrid Air Vehicles, 2015a, 2015b; Hybrid Enterprises, 2015; RosAeroSystems, 2015; Shanghai Vantage Airship Manufacture, 2008; SkyLifter, 2015; Straeter, 2012; The Airship Heritage Trust, 2015; Van Wagner Aerial Media, 2015a, 2015b; Zeppelin NT, 2015).

### **2.2.2. Safety considerations**

Airships have been mistrusted for use in air passenger services since the Hindenburg Disaster of 1937 (Hillsdon, 2012), in which 36 of the 97 passengers on-board perished. This disaster was caught on camera and highly publicised (Archbold, 1994). The initial report into the Hindenburg Disaster found that it was caused by the electrostatic ignition of a mixture of free hydrogen and air allowed by a leak in two of the hydrogen cells on-board (Bureau of Air Commerce, 1937). Many journalists, however, contended that sabotage was to blame as passenger luggage and mail was not checked (Archbold, 1994). The issue was that during investigations no evidence was found of an ignition source or a sabotage plot (Bureau of Air Commerce, 1937). A more recent study into what caused the Hindenburg Disaster cast serious doubt on the conclusions from the initial report (Bain & van Vorst, 1999). This study notes three scientific facts about hydrogen: (1) it explodes when ignited; (2) it burns with a colourless flame; and (3) it only burns upward. Yet when compared to the recordings of the Hindenburg Disaster and key witnesses' accounts it is clear that the Hindenburg did not explode, the flames were colourful and there was clearly downward burning (Bain & van Vorst, 1999). Rigas and Sklavounos (2005) show evidence that the material and paint used to cover the airship were highly flammable and capable of being ignited with an electrostatic charge. Accordingly, the problem was not hydrogen, but the misconception that hydrogen is innately dangerous as a lifting gas is commonly held.

The alternative to using hydrogen for lift is helium. Helium is 7.3% less effective at producing lift than hydrogen, but has advantages in that it is inert and incombustible (Liao & Pasternak, 2009). The key disadvantage of helium, however, is that it is much more expensive than hydrogen (Baughman, 2013; Liao & Pasternak, 2009). Because of this, if safety proves not to be a major concern in this study, it may make more sense for potential airship operators to use hydrogen as the lifting gas. However, if safety proves to be a concern then it would be better to use helium to ensure that consumers are not put off due to safety concerns about the lifting gas.

## **2.3. Historical Overview of Airships**

While no current airship services exist that are similar to what could be offered in Queenstown, there have been some applicable uses of airships in history. Although the technology that the airships used was inferior and the markets were very different (economically and demographically), these historic cases represent the only directly comparable product to what is being suggested in this thesis.

### **2.3.1. German Airship Transportation Company**

The first such example came from Count Ferdinand Adolph Heinrich von Zeppelin, the inventor of the rigid airship. Zeppelin started the German Airship Transportation Company (German acronym: DELAG) in November 1909 as an effort to demonstrate the basic soundness of his concept (Stephenson, 2010). It is considered as the world's first airline, carrying over 34,000 passengers across 1,500 flights without injury between the company's inauguration and the outbreak of World War I (Grossman, 2009a). The flights prior to World War I were often given gratis to aristocrats, business leaders and government officials in order to publicise the Zeppelin industry, with there only being 10,197 paying customers during this time (Grossman, 2009a). Passengers flew in luxury with food and drinks being served as they looked out at the scenery of Germany (see Figure 4). These flights were not designed to provide scheduled intercity passenger travel, but were rather to observe scenery.

Post-World War I, DELAG established the first scheduled airline services between Friedrichshafen and Berlin. There were 103 flights following World War I, carrying almost 2,500 passengers, 11,000 pounds of mail and 6,000 pounds of cargo (Grossman, 2009a). The service eventually collapsed as part of the Treaty of Versailles, which required the two airships operated by DELAG to be handed over to Italy and France, respectively. Accordingly, this service did not fail because its concept was wrong, but rather due to Germany losing World War I.

**Figure 4. Passengers On-Board a Pre-World War I DELAG Flight**



*Source: Grossman (2009a)*

### **2.3.2. After World War I**

Substantial military investment was lost in airships following World War I. This is because the “technical difficulties, the high flammability of hydrogen and the inherent structural delicacy, combined to make the craft fundamentally ill-suited for war” (Stephenson, 2010, p. 35). What this meant was that airships were seen only as a potential means of transporting passengers and cargo between destinations.

### **2.3.3. Graf Zeppelin**

The Graf Zeppelin was one of the most successful airships of all time. It flew over a million miles across 590 different flights, carrying thousands of passengers and hundreds of thousands of pounds worth of freight and mail (Grossman, 2009b). One thing that was noted with this design was that, due to its immense size and sophisticated control systems, the airship was incredibly stable. In fact, one passenger’s story on-board the Graf Zeppelin recounts passengers competing to see how long they could balance a pencil on the end (Christopher, 2010). The Graf Zeppelin flew around Europe, the North Pole, North and South America, Africa and Asia. Its last passenger flight was between Brazil and Germany in

1937. The Hindenburg Disaster occurred during this flight and upon arrival back in Germany the ship was decommissioned.

#### 2.3.4. Hindenburg

While the Graf Zeppelin was arguably the most successful airship, the Hindenburg is certainly the most well known. The Hindenburg was the first airliner to provide a scheduled service between Europe and North America (Archbold, 1994). The historical analysis provided here has been sourced from Archbold (1994). The Hindenburg's first flight was on March 4 1936, it was filled with 7 million cubic feet of hydrogen and was 245 metres long. For ease of comparison, Figure 5 shows a comparison of the LZ-129 Hindenburg with a Boeing 747-400.

**Figure 5. Comparison of LZ-129 Hindenburg with a Boeing 747-400**



Source: Airships.net

The immense size of the structure meant that its cabin was separated into two stories and it was equipped to carry up to 61 crew and 72 passengers on multi-day trips. On May 6, 1936, the Hindenburg began its service providing regular transatlantic crossings between Germany and the United States. Its quickest voyage was approximately 43 hours. The top deck of the Hindenburg was equipped with a dining room, a lounge, a writing and reading room, passenger cabins and promenades on either side of the deck. The lower deck of the Hindenburg was equipped with a smoking room, a bar, passenger toilets and

shower facilities, kitchen facilities, the crew and officer's mess, an observation deck and several larger cabins that offered windows for outside viewing.

While the primary purpose of the Hindenburg was to provide transatlantic passenger flights, sometimes sightseeing was provided as part of these flights. Werner Franz, the Hindenburg's youngest crew member notes that on the last transatlantic flight there was bad weather in the landing location so the Hindenburg instead flew an alternate course to go sightseeing along the coast of New Jersey (Verstraete, 2012). It is arguable that sightseeing was a contributing factor to passenger's motivation for taking the Hindenburg. As previously discussed, the Hindenburg ended in tragedy on the 6<sup>th</sup> of May 1937, where 36 of the 97 passengers on-board perished due to an accident when mooring that ignited the ship's fabric coating. This was caught on camera and highly publicised, effectively ending the airship era.

### **2.3.5. Airship Industries**

In the 1970s and 1980s interest in airships increased in Britain due to the developments of Airship Industries. Airship Industries produced a fleet of successful multirole airships that were used primarily for sightseeing tours (Amir, 2016). The company primarily used the Skyship 500 (eight passengers) and Skyship 600 (18 passengers) airships, which they also built. Using these airships, Airship Industries provided scheduled sightseeing services over Cardington (UK), Weeksville (US), Paris, Tokyo, Sydney and various temporary locations across the United States and Canada (The Airship Heritage Trust, 2014, 2015). In its most successful year, 1987, the Skycruise programme offered a schedule of 700 flights between March and October that proved so popular that all 700 flights were sold out in 72 hours (The Airship Heritage Trust, 2014). Exact details about the demise of this company could not be obtained, other than it made a huge loss in the year of 1989 and refinancing efforts failed leading it into receivership in 1990 ("Airship Industries appoints receiver," 1990; Goold, 1990). Airship Management Services bought out the rights to all the airships and they are still used today but for advertising purposes rather than sightseeing

(Mowforth, 2007). This example highlights that demand for scenic airship services has existed in recent decades. However, it is difficult to make any further inference because the exact details of the demise of the company are unknown. This may mean that despite very high demand, the business model of a scenic airship service may not have been economically viable.

### **2.3.6. New Zealand Aerospace Industries**

During the 1970s, there were several proposals brought forward for the use of airships in New Zealand. Monk (1979) provided a detailed report about these proposals along with preliminary findings as to their viability. In 1974, New Zealand Aerospace Industries Limited (NZAIL) was approached by a group of Hamilton-based businessmen who were interested in developing airships for use as cargo transporters. The investigation was widened after a world trip and five airship models were designed for use in New Zealand for the following applications:

1. Model 1: The transport of natural gas and liquid petroleum between the North Islands and the South Island. The airship would be unpowered and unmanned and towed by a manned and powered tug.
2. Model 2: The transport of general cargo in a container form by a vessel derived from the first model, however, this time it would be powered and manned.
3. Model 3: Similar to model 2, but designed to carry indivisible loads of up to 40 tonnes.
4. Model 4: A car and passenger ferry for use over short, high traffic density distances such as the Cook Strait. A redesign of the first model.
5. Model 5: An economic zone surveillance and protection vehicle.

The key advantage of these proposals in the eyes of NZAIL was that these airships would have used one-seventh the fuel of contemporary jet freighters; yet travel at one-quarter the speed. At the time, these designs would have also been seven times faster than any equivalent surface shipping. In essence,

airships were seen to provide a better balance between speed and efficiency than contemporary alternatives. Monk (1979) also outlined that the project was too ambitious for NZAIL and New Zealand in general at the time. The report recommended waiting until such a time that New Zealand had the resources to build and maintain such tremendous airships. Significant interest was noted in the project from private investors and NZAIL published the report because they deemed the proposals to be in the best economic interests of the country. Most importantly for this thesis, the report shows that there were no major concerns from an engineering or operational standpoint about introducing airships for commercial operations within the New Zealand environment. While it is possible that the relevance of these findings might have changed since 1979, it is unlikely as recent advances in stability and control (Cook, 2012), propulsion (Cheeseman, 2012), materials (Islam & Bradley, 2012), structures (Luffman, 2012), systems (Mayer, 2012) and ground handling (Camplin, 2012) theoretically should enhance rather than detriment the capabilities of airships for serving the New Zealand environment.

### **2.3.7. Zeppelin NT**

Zeppelin NT is a company based in Friedrichshafen, Germany that provides flights using a modern rigid airship. Each flight carries 12 to 14 passengers and the airship is equipped with a toilet (Zeppelin NT, 2016b). The company opened for business in 2001 and since then has carried approximately 130,000 passengers (Zeppelin NT, 2016b). Its focus is less on the scenery and more the unique experience of flying on an airship and learning about the history of their use and the technology that makes them fly (i.e. heritage rather than scenic activity) (Zeppelin NT, 2016a). Zeppelin NT is the only current example of a scheduled passenger airship service in the world; accordingly, it is interesting to look at its pricing structure as a comparison (see Table 4)

**Table 4. Zeppelin NT Pricing Structure on 26 April 2016**

<b>Duration</b>	<b>Adult Fare</b>	<b>Child Fare</b>
30 minutes	€220	€176
45 minutes	€340	€272
60 minutes	€425	€340
90 minutes	€610	€488
120 minutes	€795	€636

*Source: Zeppelin NT (2016c)*

## 2.4. Potentially Related Industries

### 2.4.1. The Aviation Industry

The aviation industry encompasses a large number of activities, of which some relate to the idea of having a scenic airship service. There are several ways to separate aviation activities into categories. CAANZ, for example, separates organisations that conduct aviation activities into flight operations (e.g. airlines, adventure aviation), organisations and agencies (e.g. aircraft maintenance, airport security), aerodromes and/or airways services (e.g. air traffic control) for the purposes of making regulations (CAANZ, 2016). It is obvious that the area that a scenic airship service would fit into is flight operations. Although in reality the company may also maintain the airships and have its own aerodrome, these considerations are outside the scope of this thesis. Flight operations can be further separated into *scheduled*, where the flight operations are conducted according to set schedules, or *on-demand* (sometimes called *non-scheduled* or *ad hoc*), where the flight services are available only when requested or needed (Sheehan, 2013). A scenic airship could fall into one or both of these categories according to what is desirable for tourists.

According to CAANZ (2012), Queenstown has a number of aviation activities within its airspace, including scheduled airline traffic, light aircraft on scenic flights, aerobatic flights, flight training, helicopters on scenic flights and ferrying tourists to other adventure activities, balloons, gliders, hang gliders, paragliders and parachutes. The wide variety of aviation activities logically indicates that there is currently demand for aviation activities within Queenstown, further enhancing the argument for its use as a case study.

Airlines, despite also being businesses that operate aircraft, fundamentally differ from the idea of scenic airship services in how they derive their demand. Demand for air travel is derived demand because the demand is not for the actual act of flying in an aircraft, but rather a derived demand to participate in activities at a trip destination (Proussaloglou & Koppelman, 1999). In contrast, a

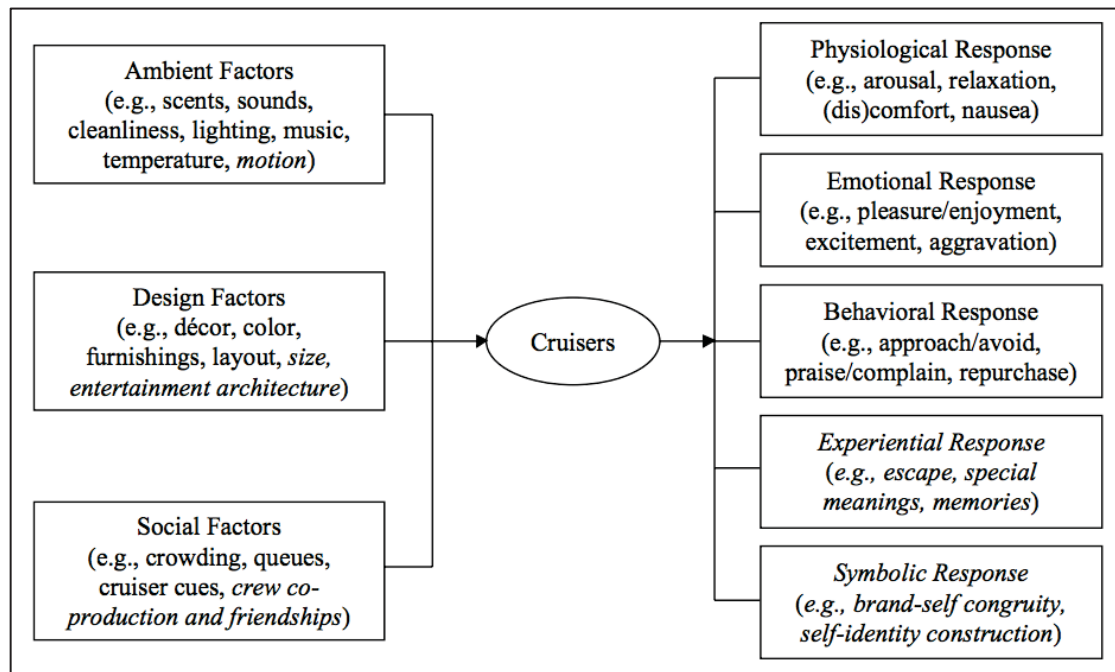
scenic airship flight would be an example of an activity that a consumer would undertake at the trip destination. Accordingly, while parallels will sometimes be made between the airline industry and the findings in this study, the motivating and mediating factors for the demand of each are fundamentally different.

#### **2.4.2. The Cruise Industry**

Scenic airship services are potentially related to cruise ship services due to their shared characteristic of customisability, particularly with regard to the design of the interior and the facilities that can be provided on-board. The cruise industry is characterised by providing 'mobile resorts' that travel by sea and transport passengers from one place to another (Dowling, 2006). Demand for cruise ship tourism is derived from the relatively convenient nature of being able to visit locations without having to change accommodation arrangements (Kester, 2003). Currently, it seems that the cruise industry is maturing and there is a focus on creating bigger and better ships with more facilities and on-board activities (Weeden, Lester & Thyne, 2011). Kwortnik (2008) noted that modern cruise ships have had innovations such as an ice-skating rink, a nine-hole miniature golf course, an in-line skating track, a full-size basketball court, a shopping promenade and a rock-climbing wall that scaled the back of the ship's huge funnel. More standard amenities include ample bars and restaurants, spas, fitness centres, pools, theatres, clubs, casinos, video arcades, children's play zones and balconied cabins (Kester, 2003; Kwortnik, 2008). It is possible that consumers' interest in scenic airship services is a function of what facilities are on-board, much like with the cruise industry.

Facilities contribute towards servicescapes, which are the conceptual framework developed by Bitner (1992) to describe the impact of physical surroundings (e.g. atmospherics, décor and physical design) on the behaviours of both consumers and employees in consumption settings. No studies have been conducted on servicescapes in airships, but Kwortnik (2008) has examined the shipscape influence on the leisure cruise experience. The framework developed from Kwortnik's (2008) research is shown in Figure 6.

**Figure 6. Servicescape Framework for Leisure Cruises**



Source: Kwortnik (2008)

It is also interesting to look at the dimensions of motivations for cruise ship passengers. Teye and Paris (2010) found five such dimensions, which were: (1) convenience/ship based, i.e. activities, comfort, cuisine; (2) exploration/destination based, i.e. culture, interesting stop-offs, novelty; (3) escape/relaxation, i.e. get away from everyday life, rest a lot; (4) social, i.e. be entertained, enjoy the company of others, make new friends; and (5) climate, i.e. escape home weather, enjoy tropical weather. These dimensions provide a basis for drawing more concise comparison between scenic airship services and the cruise industry from the perspective of tourists.

## 2.5. Discussion

The Literature Review section has shown a number of key points and issues that justify the need for research into the possibility of scenic airship services in Queenstown, New Zealand. First, tourists make purchasing decisions based upon their objective and subjective situations (Gnoth, 1997) and general principles about what factors are used to make these decisions should be examined using descriptive models that do not assume rationality (Ehrenberg *et al.*, 2000). Second, tourist experiences are subjective and there is no one-size-fits-all approach to creating a memorable experience (Tung & Ritchie, 2011). Third, airships are unique in their attributes (Hillsdon, 2012; Pant, 2010; Recoskie *et al.*, 2013), potentially indicating that they also provide a unique tourist experience. Fourth, there are no safety considerations that preclude the use of airships for passenger services. Lastly, there are historical examples of airships being used for similar services that were prematurely stopped due to a variety of reasons. Most importantly, no research has examined consumer interest towards the idea of scenic airship services. Accordingly, this study aims to address this gap in the literature by answering the two research questions presented in the Introduction section.

## **3.0 Methodology**

### **3.1. New Product Development**

New Product Development (NPD) is a field of study concerning the development of new products for consumers to purchase. Nagamachi (1995) noted that there are two major approaches to NPD: (1) the product-out strategy, where the product is created through the designer's own concept with no regard for consumer's demand and preference; and (2) the market-in strategy where the production of a product is primarily based upon the consumers' desire and preference. There have been relatively few market-in approaches designed for studying the development of new tourism products. Liao, Chen and Deng (2010) suggested that data mining customer knowledge from existing tourism entities can be useful for developing new tourist products. Unfortunately, data mining relies on there being an existing entity that is similar enough to study and is willing to share their data. Another approach that has been suggested is to qualitatively interview a specific group of tourists about their motives for travel and to use these motives as a basis for developing new tourist products (Clever, Muller, Ruys & Wei, 1999). However, it is arguable that while motives may provide ideas for new products, they provide no empirical evidence that the new product may be successful without further concept testing.

Another important differentiation to make with regard to NPD is the difference between incremental or continuous products and discontinuous products. Incremental or continuous product development relates to product improvements, upgrades and line extensions, whereas discontinuous product development involves the creation of radically new products (Veryzer, 1998). Several studies have shown that using NPD processes for continuous product development are ineffective and potentially detrimental when used for developing discontinuous products (Lynn, Morone & Paulson, 1996; Song & Montoya-Weiss, 1998; Veryzer, 1998). This study argues that scenic airship

services would be a discontinuous product in the sense that they would not be an improvement of an existing product, but rather a radically new concept.

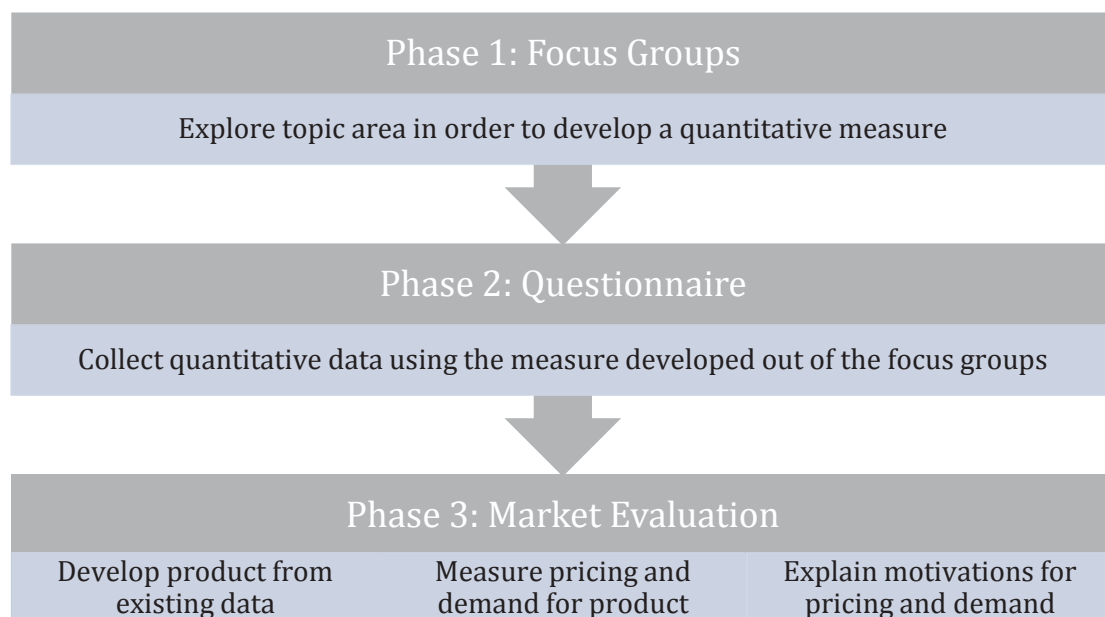
There have been two NPD processes suggested for discontinuous products. Veryzer (1998) suggested that the process should start with the convergence of developing technologies, visionaries and contextual and environmental factors. This convergence results in the formulation of a new product, of which a preliminary design is made. A prototype is then tested in the market and the design is modified according to market preferences. Lynn *et al.* (1996) also suggested a probing and learning approach, whereby an early version of a product is developed and is tested in a plausible initial market. The developer then learns how the market thinks about the product and this learning results in ideas for improving the product or better applying it to existing markets.

Existing models for discontinuous NPD are not necessarily wrong, however, they start with the same fundamental assumption: that a new product offering can be subjectively developed and then improved after release into the market place. This thesis differs in this fundamental assumption by suggesting that a sample of the market place should be used to develop a new product. This is not to say that the convergence of visionaries, technology and contextual factors do not contribute, but rather they should only provide a concept or idea for a product. This concept or idea should then be proposed to a sample of consumers qualitatively for their input and no assumptions should be introduced. The next step should be quantifying the prevalence of the ideas represented in the qualitative phase. This data can then be used to develop an initial product offering and similar processes to what Veryzer (1998) and Lynn *et al.* (1996) suggest can then be followed to test and improve the product in market settings.

### 3.2. Research Design

In order to create a new discontinuous NPD process for use in tourism, this study will use both exploratory and explanatory sequential mixed methods. Exploratory sequential mixed methods work by collecting qualitative data in order to develop a quantitative measure without biasing it by the researcher's own assumptions. Quantitative data is then collected using this unbiased measure in order to quantify consumer preferences. This approach is appropriate for studying new areas (products and services) where quantitative measures do not exist and cannot be developed from past studies (Creswell, 2014). Explanatory sequential mixed methods start with quantitative data and then qualitative data is collected in order to explain the reasons behind the quantitative findings. This approach is useful for removing assumptions when interpreting the quantitative results (Creswell, 2014). This thesis uses both exploratory and explanatory sequential mixed methods in order to answer the research questions established in the Introduction section and provides a more objective discontinuous NPD process for use in tourism. The research design for this study is shown in Figure 7.

**Figure 7. Research Design**



Harrison and Reilly (2011) identified that while mixed-methods approaches are becoming increasingly used amongst the social sciences, marketing research using mixed methods is more obscure. This conclusion was made through an analysis of 2,166 articles published between 2003 and 2009 across nine 'prominent' marketing journals, of which only 43 studies used mixed method research techniques. Out of these 43 studies, 34 used sequential mixed methods techniques. This suggests that while still uncommon within the marketing literature, sequential mixed methods techniques are the most accepted within the marketing literature.

### **3.3. Paradigm**

Mixed methods approaches often favour either the qualitative or quantitative component of the research (Creswell, 2011; Harrison & Reilly, 2011). When the quantitative approach takes priority, mixed methods research is often associated with postpositivism (Creswell, 2011). Postpositivism is a belief that the personal attributes (e.g. values and background) of the researcher can influence the observations that he/she makes (Phillips & Burbules, 2000). This is different to positivism (where the assumption is that these personal attributes are independent of observations) and interpretivism (where personal attributes are subjectively accepted) (Groff, 2004; Phillips & Burbules, 2000). In post-positivism, personal attributes are objectively mitigated through research design (Groff, 2004; Phillips & Burbules, 2000). This thesis is taking a postpositivist paradigm because the researcher's own biases may influence the formulation of a quantitative measure and the interpretation of quantitative results. This will be objectively countered by employing focus groups to help develop a quantitative measure and by qualitatively asking participants why they have answered in a certain way. The quantitative side will take precedence over the qualitative, however, as the quantitative data will empirically assess the opinions of the focus groups. In addition, the market evaluation at Queenstown will give further credence to any findings by assessing whether and why participants (tourists) would pay for a product (scenic airship service) developed out of the quantitative data. These phases will combine to provide a phenomenological

description of how tourists think about scenic airship services. Such a phenomenological approach has been advocated as being an appropriate application of the postpositivist paradigm to tourism research (Ryan, 2000).

### **3.4. Ethics**

This thesis was evaluated by peer review and judged to be low risk. Consequently, it was not reviewed by one of Massey University's Human Ethics Committees. A low risk notification was sent to the Massey University Human Ethics Office. The notification was acknowledged and research was approved to commence.

### **3.5. Thematic Analysis**

All qualitative data collected in this study was analysed using thematic analyses. Thematic analyses are a useful method for analysing qualitative data because they are incredibly flexible and allow for unanticipated insights, while also potentially providing a rich and detailed account of the data (Braun & Clarke, 2006). In this sense one of the key advantages is that the description and interpretation of findings does not lose the context of the discussions that took place (Vaismoradi, Turunen & Bondas, 2013). Sometimes questions arise as to the best form of qualitative analysis to use in order to answer research questions. Vaismoradi *et al.* (2013) identify that in nursing, for example, content analyses and thematic analyses are often used interchangeably due to confusion surrounding the differences in methodology. Braun and Clarke (2006) also suggest that there is confusion around the specific methodology that forms a thematic analysis and aim to provide a clear methodology through their 15-point checklist for a good thematic analysis. This checklist is shown in Table 5.

**Table 5. Checklist for a Good Thematic Analysis**

Process	No.	Criteria
Transcription	1	The data have been transcribed to an appropriate level of detail and the transcripts have been checked against the tapes for accuracy.
Coding	2	Each data item has been given equal attention in the coding process.
	3	Themes have not been generated from a few vivid examples (an anecdotal approach), but instead the coding process has been thorough, inclusive and comprehensive.
	4	All relevant extracts for each theme have been collated.
	5	Themes have been checked against each other and back to the original data set.
	6	Themes are internally coherent, consistent and distinctive.
Analysis	7	Data have been analysed – interpreted, made sense of – rather than just paraphrased or described.
	8	Analysis and data match each other – the extracts illustrate the analytic claims.
	9	Analysis tells a convincing and well-organised story about the data and topic.
	10	A good balance between analytic narrative and illustrative extracts is provided.
Overall	11	Enough time has been allocated to complete all phases of the analysis adequately, without rushing a phase or giving it a ‘once-over-lightly’.
Written Report	12	The assumptions about and specific approach to, thematic analysis are clearly explicated.
	13	There is a good fit between what you claim you do and what you show you have done – i.e. described method and reported analysis are consistent.
	14	The language and concepts used in the report are consistent with the epistemological position of the analysis.
	15	The researcher is positioned as <i>active</i> in the research process; themes do not just ‘emerge’.

Source: Braun and Clarke (2006, p. 96)

Generally speaking, these checkpoints have been employed when conducting thematic analyses for this study. However, it must be noted that Braun and Clarke (2006) made the assumption that thematic analyses would be the primary means of analysing the data for the study. For this study, this assumption is untrue. Specifically, this makes point 10 somewhat invalid. This study will provide very few illustrative extracts in the interest of saving space because these would not add anything meaningful that cannot be understood from the analytical narrative and the quantitative results from the other phases.

It should also be noted that there are differences in the analysis of focus groups and market evaluation. This is due to the impact of group dynamics on the results. For example, in the market evaluation it is clearly the individual that is the unit of analysis because each individual completes the evaluation by

him/herself. In a focus group, it is important to be flexible when analysing the data in order to identify any undue influence of the group onto individuals or *vice versa* and take these influences into account (Kidd & Parshall, 2000). This also gives credence towards not using computer software to analyse focus group data.

### **3.6. Statistical Analysis**

This study uses different statistical analyses due to the variety of variable types studied in the questionnaire. This section outlines which types of statistical analysis have been used for what types of variables and why. In some cases variables are analysed with more than one type of statistical analysis. All statistical tests and analyses were conducted using the computer software SPSS 22. The alpha level used for this study was 0.05, meaning that any *p*-values equal to or less than this critical value were treated as statistically significant. Each question type was analysed using the same statistical tests, as stated in each section below.

#### **3.6.1. Demographic Questions**

Demographic information was collected for the purposes of defining the sample and making comparisons among groups (Cozby & Bates, 2012). Accordingly, demographic data relating to gender, age, country of residence, relationship status and parental status was analysed using descriptive statistics to describe the sample. Demographic information was also used to make comparisons between groups as described later in this section.

#### **3.6.2. Multiple-Choice Multiple-Answer Questions**

The questionnaire used several questions that allowed multiple choices and multiple answers. This created a problem in calculating the degrees of freedom. Degrees of freedom can be defined as the number of independent observations remaining in the sample and is calculated as a function of the number of independent observations (usually sample size) and the number independent

variables (Panik, 2012; Trochim, Donnelly & Arora, 2015). Difficulty arises in this study because several questions allowed for multiple answers from participants. This means that the number of participants does not equal the number of independent observations and the number of independent observations becomes incalculable. This creates a situation where there are infinite degrees of freedom. Inferential statistics cannot be calculated without degrees of freedom. Accordingly, descriptive statistics have been used for this question type.

### **3.6.3. Likert-Scale Questions**

This questionnaire utilised several likert-scale questions. The data collected from these questions were analysed using a one-sample *t*-test and a chi-squared goodness-of-fit test. Two tests have been chosen due to on-going disagreement as to the best test to use for analysing likert-scale data in single sample studies. This disagreement is largely based upon whether the researcher treats likert-scale data as interval or ordinal level data. If interval data is assumed then parametric tests, such as the one sample *t*-test may be used. Parametric tests require interval or ratio level data and are desirable over non-parametric tests because they have better statistical power and provide more useful information (Sarantakos, 2013). However, if likert-scale data is treated as ordinal then it is non-parametric, which means that only the less powerful non-parametric tests should be performed.

The theoretical debate as to whether likert-scales should be analysed using parametric or non-parametric tests goes back to past literature from the field of psychology. At the conservative end of the spectrum, Siegal (1956) argued that using ordinal level data with parametric tests was adding information and would create distortions in the results obtained from such tests. It is possible to see some merit in Siegal's (1956) argument when looking at the five category likert-scale used in this thesis. Likert-scale questions allow a participant to select between a set number of ordinal categories, each with a corresponding number (e.g. 1, 2, 3, 4, 5 to number off strongly disagree to strongly agree). While it is assumed that the participant knows that 'strongly agree' indicates a higher level

of agreement than 'agree', the likert-scale may not make it clear to participants that the difference between each category is equal. Furthermore, mean likert-scale scores usually are values that are not possible on the original scale (e.g. 2.54). It is also possible to get a normal distribution that goes beyond the boundaries of a likert-scale (e.g. a mean of 4.2 with a standard distribution of 0.9). Likert-scale data violates two assumptions of one-sample *t*-tests in that the variable is not measured at the interval or ratio level and the data is not normally distributed (Laerd Statistics, 2015).

However, Anderson (1961) showed that there were only small differences between parametric tests and rank-order tests (a form of non-parametric test) for ordinal level data with regard to statistical significance and statistical power. His argument was that non-parametric data should be used in parametric tests if this provides more useful information for answering research questions. The one-sample *t*-test provides a mean and a standard deviation for the sample and then compares this against the null hypothesis score of 3 (neutral). With a mean and standard deviation, it makes it possible to imagine what a normal distribution would look like, thus adding value to this thesis.

One sample *t*-tests are a popular form of likert-scale analysis in the tourism literature (e.g. Byrd, Bosley & Dronberger, 2009; Lundberg, Gudmundson & Andersson, 2009), but it has to be acknowledged likert-scale data violates two assumptions one-sample *t*-tests. Accordingly, chi-squared goodness-of-fit tests were also used because likert-scale data meets all their associated assumptions, meaning that results do not come with caveats. The chi-squared goodness-of-fit test compares the number of participants who select each particular category against the number that would be expected to select each category by statistical probability alone (Israel, 2009). With a chi-squared goodness-of-fit test, the most appropriate measure of central tendency is the mode (because it assumes that the data is categorical). If both the single sample *t*-test and the chi-squared goodness-of-fit test provide similar results, then this means that the findings should be treated as conclusive. Chi-squared goodness-of-fit tests are also useful for showing neutrality because the neutral category can become statistically

significant, whereas in a one sample *t*-test neutrality is treated as the null hypothesis.

Several relationships and associations were tested for likert-scale questions in this study. Simple linear regressions (ordinary least squares - OLS) were used to see whether relationships existed between age and likert-scale scores. Simple linear regressions try to explain variance in the dependent variable (likert-scale score) by using an explanatory variable (age). If statistically significant, an equation is formed using the correlation coefficient, which indicates the direction and magnitude of the relationship (Chatterjee & Hadi, 2006). The  $R^2$  value is the percentage (shown in decimal form) of the variation in the dependent variable that can be explained by the explanatory variable (Chatterjee & Hadi, 2006). Using this form of analysis the nature and strength of the relationship can be determined.

Gender, relationship status and having children were also tested for associations with likert-scale scores in this study. Due to the categorical nature of these demographics, a chi-squared test for independence was used. This test uses contingency tables where each demographic category forms a row and each likert-scale category forms a column. Participants are allocated to the cell that matches both their demographic category and their likert-scale category (e.g. male, agree). Maximum likelihood estimation is then used to approximate the chi-squared distribution for the null hypothesis (i.e. independence). The chi-squared test of independence then compares the observed frequencies in each cell against the expected frequencies if the two variables were independent (Agresti & Kateri, 2011). If there is sufficient difference between two variables then the test will show a statistically significant result. One important assumption to meet for this test is that at least 80% of cells should have a value of 5 or more. Thus, relationship status was recategorised, with only three categories: (1) single, (2) married, de facto or in a civil union and (3) in a relationship. Participants who selected 'I'd prefer not to answer' were excluded from chi-squared tests of independence.

#### **3.6.4. Rank Order Questions**

Data analysis for this type of question consisted of a Friedman test and if statistical significance was reached, a post-hoc test using a Wilcoxon signed-rank test with the Bonferroni correction applied. A Friedman test is the non-parametric alternative to the one-way ANOVA and is used to test for differences between groups (or in this case categorical items) when the dependent variable measured is ordinal (Laerd Statistics, 2013). The post-hoc Wilcoxon signed-rank test calculates the direction and magnitude of difference between the observed and hypothesised median rank for each categorical item (Israel, 2009). When making multiple comparisons across categorical items, the likelihood for Type I error increases because the alpha level (the level used to determine statistical significance) that each categorical item's null hypothesis is being compared against has not been adjusted to reflect that the sum of probability that each item's null hypothesis would be rejected can only be equal to or less than the probability that the null hypothesis for the group of categorical items would be rejected (Aickin & Gensler, 1996). Accordingly a Bonferroni correction must be applied. The Bonferroni correction adjusts the alpha level used for comparing each categorical item's null hypothesis against by dividing alpha by the number of comparisons that will be performed (Aickin & Gensler, 1996).

#### **3.6.5. 'Yes' or 'No' Questions**

'Yes' or 'No' questions underwent a chi-squared goodness-of-fit test because these questions assess nominal level data. The chi-squared goodness-of-fit test will answer whether there is significantly more or less interest in a category than what would be expected by statistical chance alone (Israel, 2009).

A binary logistic model was used because participants had to choose between 'Yes' or 'No', producing binary categorical data (i.e. Yes = 1, No = 0) that cannot be processed with linear regressions (OLS) (Burns & Burns, 2008) The model has been used to determine which (if any) demographic factors affect participant choice with regard to preferences towards a scenic airship service. Logistic regressions predict discrete categorical outcomes from one or more explanatory

variables that may be nominal, ordinal, ratio or continuous level data (French, Immekus & Yen, 2013). After an initial regression, a set of Wald criterion values is given for each of the explanatory variables. Any explanatory variable's Wald criterion that fails to reach statistical significance is dropped from the model and a new regression is undertaken with only the statistically significant explanatory variables (Burns & Burns, 2008). The overall model must also reach a cut value of 0.5% prediction for both 'Yes' and 'No' before it can be useful (Burns & Burns, 2008). If this cut value is not met for either 'Yes' or 'No' prediction then a chi-squared test for independence will be undertaken for the statistically significant predictors in the same way as for likert scales. The prediction percentages are simply an indication as to how accurate the model is at classifying participants into 'Yes' or 'No' using the predictor variables of the model. Binomial logistic models provide  $\text{Exp}(B)$  values which can be used to quantify how predictor variables affect participants in answering 'Yes' or 'No' (e.g. males are 11% more likely to answer yes than females). This test was only done in cases where it would be of pragmatic value and where less than 90% answered either 'Yes' or 'No'. If 90% of the sample agreed to a 'Yes' or 'No' answer then this was treated to mean that the effects of age, gender, relationship status and having children were negligible.<sup>2</sup>

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<sup>2</sup> To gain a greater understanding of the process of developing binary logistic models, please refer to Andrews, Loftsgaarden and Bradshaw (2003).

## **4.0 Phase 1 – Focus Groups**

### **4.1. Methodology**

Focus groups are informal discussions between selected individuals about specific topics (Wilkinson, 1998). These informal discussions provide the researcher with qualitative data. Qualitative data, generally speaking, provides three strengths over quantitative data: (1) exploration and discovery, i.e. learning about topics that are poorly understood; (2) context and depth, i.e. understanding the background behind people's thoughts and experiences; and (3) interpretation, i.e. giving an understanding of why things are the way they are and how they got to be that way (Morgan, 1998). The focus group process was piloted once before final administration.

#### **4.1.1. Recruitment**

Participants were recruited from within Massey University. For ethical reasons no students of the researcher could be asked to participate.<sup>3</sup> Convenience sampling was used. It was recognised from the outset that university staff and students would not form a generalisable sample. However, because the results of the focus groups were only used to create a quantitative measure and this quantitative measure produced empirical results, this drawback is not a significant concern.

#### **4.1.2. Process**

When participants arrived for the focus group, they were given an information sheet that provided several pictures of airships, cabin designs and food/drink facilities that could be provided on-board (see Appendix F – Airship Information Booklet). The key point of this exercise was to demonstrate to participants what airships look like, what their characteristics are and how their design can differ significantly from conventional aircraft. It was deemed necessary to provide

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<sup>3</sup> The researcher teaches several courses for Massey University.

participants with some of these ideas, as many may not have been aware of what airships were and many may have limited their ideas and suggestions only to what is possible in an ordinary commercial aircraft cabin.

Participants were seated around a large table and food and drink was offered to help provide a casual atmosphere for discussion. Each focus group required 8 – 12 participants as this number allows for a wide variety of opinions, while still giving each individual a chance to contribute. Each focus group lasted for roughly 45 minutes. All questions were both verbally asked and provided in a large printed format in the centre of the table so that participants could refer back to them when necessary during discussion.

After checking that all participants had read their information sheet, the moderator explained that the study is about scenic airship services. Following this, the question was put to participants: “If there was a scenic airship service in New Zealand, where would you want it to be?”

After discussing location, the moderator would present to participants specific locations in the following order:

1. Queenstown/Wakatipu Basin
2. Milford Sound and Mountain Areas
3. Fiordland National Park
4. Tarawera
5. Thermal Wonderlands
6. Taupo/Central Plateau

When each location was presented, a sheet with three or four pictures would be placed in the centre of the table for viewing. It should be noted that these specific locations were just probes to get general principles out of participants, rather than to study whether these six locations would be appropriate. These locations were chosen to represent some of the major tourist attractions across New Zealand. For each location the moderator would give the same two instructions:

1. "Using the information sheet and your own imagination, say what you would like an airship service to that location to be like"
2. "You can suggest anything, be creative, think about what you would actually want."

Finally, once participants had indicated that they had no more suggestions to present, the moderator would ask the following three questions:

1. "Does anything make you think twice about flying in an airship?"
2. "Would anything stop you from flying on an airship?"
3. "Is there anything you would like to add?"

## **4.2. Results**

### **4.2.1. Participants**

There were a total of 28 participants, spread across three different focus groups. Each focus group met the prescribed requirement of 8 – 12 participants per group. 13 (46.4%) participants were males and 15 (53.6%) were females. The mean age was 27.7 years, with the youngest being 18 and the eldest being 66. There were participants from 11 different countries, with 11 (39.3%) from New Zealand, 7 (25%) from China and 10 (35.7%) from other countries. A full list of focus group participants categorised by gender, age and nationality is shown in Appendix E – Additional Participant Information.

### **4.2.2. Activities**

#### **4.2.2.1. Food/Drink**

During open discussion, 18 (64.3%) participants indicated that they would like food and/or drinks to be served on-board. Specifically, participants raised the ideas of a café, a restaurant, a buffet and a bar. There was also some discussion around the appropriateness of selling alcoholic beverages on-board. While six (21.4%) participants specifically indicated interest in having alcoholic beverages

available on-board, one (3.6%) participant was worried that the service may become “a rave up”.

#### **4.2.2.2. Adventure Activities**

17 (60.7%) participants suggested the idea of providing some form of adventure activity. Specifically, five (17.9%) participants suggested bungee jumping from the airship, six (21.4%) participants suggested hanging below the airship in some sort of gondola, three (10.7%) participants suggested skydiving, two (7.1%) participants suggested abseiling and two (7.1%) participants suggested a cable car. All of these suggestions, except for the cable car are theoretically possible (the cable car would not be possible because the airship would not have complete freedom to move if it were tied to a cable car from the ground).

#### **4.2.2.3. Educational Activities**

Nine (32.1%) participants were interested in educational activities. There were a number of suggestions for learning about the area that is being flown over. Participants indicated an interest in learning about the following areas:

- History of the area (five participants, 17.9%)
- Geology/Geography of the area (five participants, 17.9%)
- Astronomy (two participants, 7.1%)
- Culturally significant sites within the area (two participants, 7.1%)
- Filming locations within the area (two participants, 7.1%)
- Airship technology (two participants, 7.1%)
- Ecology (plants and animals) within the area (seven participants, 25%)

#### **4.2.2.4. General Commentary**

Four (14.3%) participants outlined that they would like to be provided with general commentary while on-board.

#### **4.2.2.5. Overnight Stay**

Ten (35.7%) participants wanted to stay overnight as part of a scenic airship service. However, there was disagreement as to whether accommodation should be provided on-board the airship or in some form of accommodation on the ground. The focus groups' ideas could be categorised into three main groups: (1) those who wanted to stay on-board the airship overnight (eight participants, 28.6%), (2) those who wanted the luxury of staying in a lodge or resort (one participant, 3.6%) and (3) those who preferred to stay in rudimentary accommodation such as cabins or huts (one participant, 3.6%).

#### **4.2.2.6. Private Functions**

Seven (25%) participants suggested that airships should be available for private hire. Several suggestions were made, such as stag/hen parties, weddings, Christmas functions and business conferences.

#### **4.2.2.7. Musical Performance**

During the focus groups, four (14.3%) participants suggested that the airship could be used as a musical performance venue. Two (7.1%) participants suggested a band, one (3.6%) suggested a symphony orchestra and one (3.6%) was non-specific.

#### **4.2.2.8. Stopping Off Along the Way**

4 (14.3%) participants liked the idea of stopping off along the way to perform some sort of activity.

#### **4.2.2.9. Scenic Service – Transport Hybrid**

During one of the focus groups there was an in-depth discussion about the idea of combining a sightseeing service with a form of transport. Specifically, using the airship as some sort of ferry where passengers could drive their car on-board, view sights and be transported from point A to point B at the same time. It seemed that all of focus group 3 (9 participants) were in support of this idea.

#### **4.2.2.10. *Uncategorised***

The following ideas were suggested in the focus groups and are not included as main sections because either practicalities, large amounts of disagreement, or lack of relevance to this thesis rule them out as being viable:

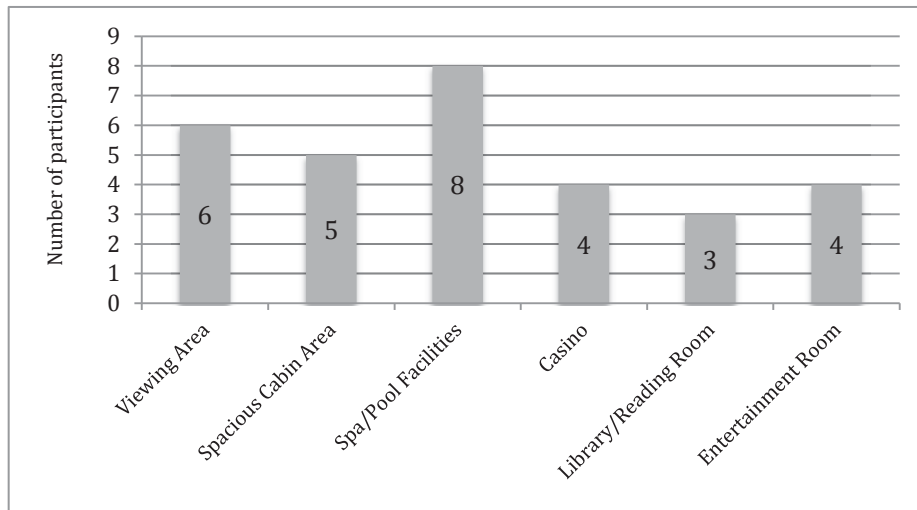
- Therapist for those who are scared of heights (if you are scared of heights, it is logical that you wouldn't buy a flight on a scenic airship service)
- On-call flights where passengers would find out last minute if they were flying or not (suggested by one participant, the rest of the focus group indicated that this may be disappointing for passengers)
- Seasonal themes, such as pirate dress up theme (suggested by one participant, the rest of the focus group indicated that it might put people off because they are too shy to dress up)
- Water landings (safety considerations)
- Advertising on the airship for additional revenue (does not fit in with the purpose of this thesis)

#### **4.2.3. *Airship Design***

##### **4.2.3.1. *Major Design Features***

This section contains major design features of the airship that would be appealing (or unappealing) to participants of the focus groups. A major design feature has been defined in terms of how difficult it would be to implement a suggestion. Suggestions in this section would likely constitute a major redesign of some part(s) of the airship. In order to have more facilities, the size of the airship must be continually increased so that weight is displaced and the airship achieves lift. The major design features suggested by participants are shown in Figure 8.

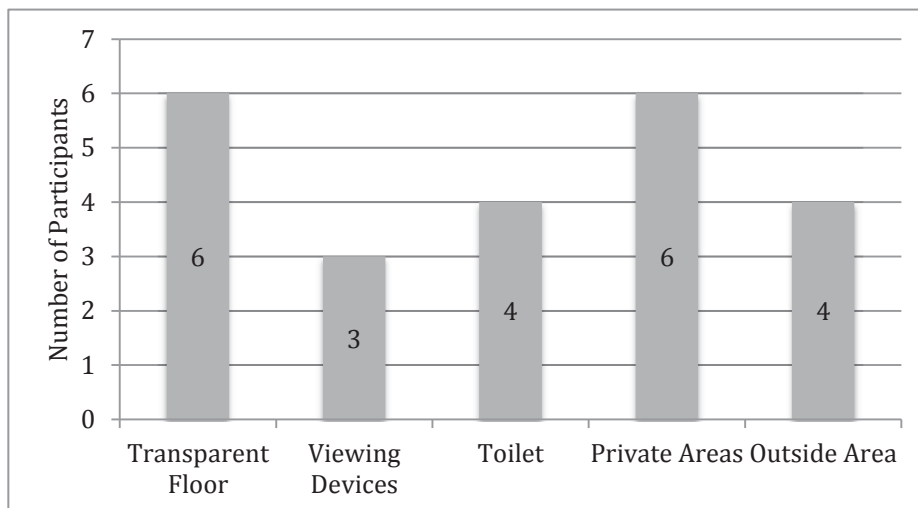
**Figure 8. Major Design Features by Number of Participants in Favour**



**4.2.3.2. Minor Design Features**

This section contains minor design features of the airship that would be appealing (or unappealing) to focus group participants. A minor design feature has been defined in terms of how difficult it would be to implement a suggestion. Suggestions in this section would likely be able to be fitted to any airship design, rather than constituting a major redesign of any part of the airship.

**Figure 9. Minor Design Features by Number of Participants in Favour**



It is worth noting that the outside area, despite sounding like a major design feature, is already possible on most airships, especially those with more traditional designs, as evidenced by the autobiography of Nevil Shute Norway, a

prominent British engineer of airships who would frequently read books in an outside area on top of the airships he worked on (Shute, 1968). Unfortunately, the focus groups did not have much consensus on the form of the outside area.

#### **4.2.3.3. *Dividing the Airship into Different Areas***

The focus group discussions highlighted that one potential problem of having different activities on-board is that some people may want them and others may not. To counter this, two (7.1%) participants suggested that the airship should be divided into different areas to cater for different activities.

#### **4.2.3.4. *Modern vs. Traditional Airship Designs***

The focus group discussions showed disagreement amongst participants as to which designs they preferred. The basis for this disagreement was primarily along the modern looking vs. traditional looking lines. The focus group participants seemed to see the hybrid-type design, the Aether concept and the SkyLifter concepts as modern, with some preferring these over traditional type designs such as the Skyship 600 or Zeppelin NT.

#### **4.2.3.5. *Interactive Information Facilities***

Six (21.4%) participants suggested some sort of interactive information facility. Specifically, two (7.1%) suggested some sort of simulator and four (14.3%) suggested some form of computer. Their intention, regardless of the type of information system used, was for passengers to be able to learn more about a specific aspect or location in an interactive way.

#### **4.2.3.6. *Wireless Internet***

Three (10.7%) participants suggested that they would enjoy having wireless Internet available on-board. Two (7.1%) of these participants cited that this would be useful for making the airship service compatible with the large number of people who use social media to share the experience with others (e.g. friends

and family). For example, one participant said, "...that would be kind of important so that people can Instagram it, Snapchat it and that sort of thing."

#### **4.2.3.7. *Uncategorised***

The following ideas were suggested in the focus groups and are not included as main sections because either practicalities, large amounts of disagreement, or lack of relevance to this thesis rule them out as being viable:

- Hammock room (suggested by one participant, the focus group did not like the idea)
- Exercise area for long flights (would take up a lot of space, add a lot of weight to the airship and does not fit in with the core idea of a scenic service)
- Exterior cameras for taking souvenir photos (safety and privacy considerations would need to be overcome first)

#### **4.2.4. Nature of the Experience**

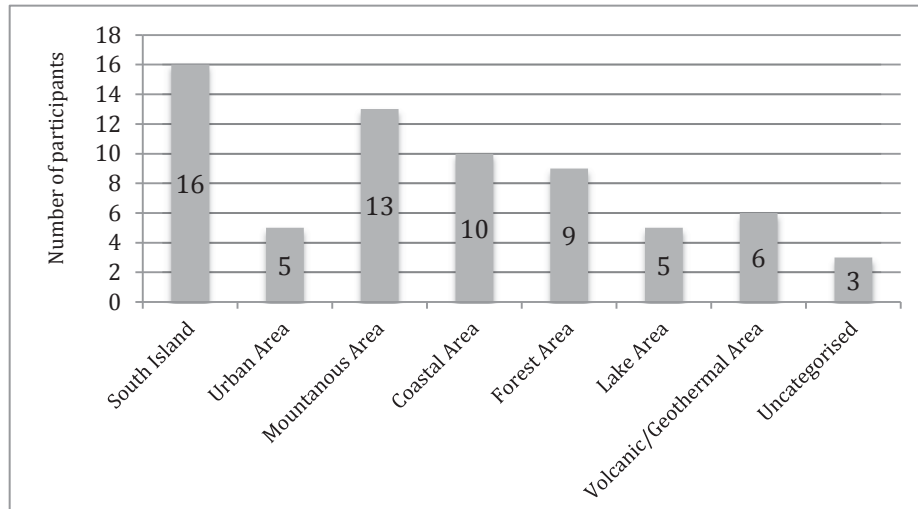
##### **4.2.4.1. *Location***

When the focus groups were administered, no specific location had been chosen to study consumer interest and preferences in regard to scenic airship services. Accordingly, it was necessary to study general principles about where consumers felt were suitable locations for scenic airship services. For the sake of simplicity, the results were restricted to New Zealand. Participants in the focus groups were asked the following question: "If there was a scenic airship service in New Zealand, where would you want it to be?"

20 (71.4%) participants gave at least one desired location. Seven participants explicitly mentioned the South Island and nine participants mentioned a location that is within the South Island (e.g. Queenstown or Milford Sound), for a total of 16 (57.1%) participants in support of the South Island as a viable location. Five (17.9%) participants thought that an urban area would be a good place for a scenic airship service. The remainder of the participants corresponded well with

the idea of nature-based tourism, with interesting areas predominantly being those that contained mountains (13 participants, 46.4%), beaches (ten participants, 35.7%), forests (nine participants, 32.1%), lakes (five participants, 17.9%) and/or volcanic/geothermal areas (six participants, 21.4%). These results are shown graphically in Figure 10.

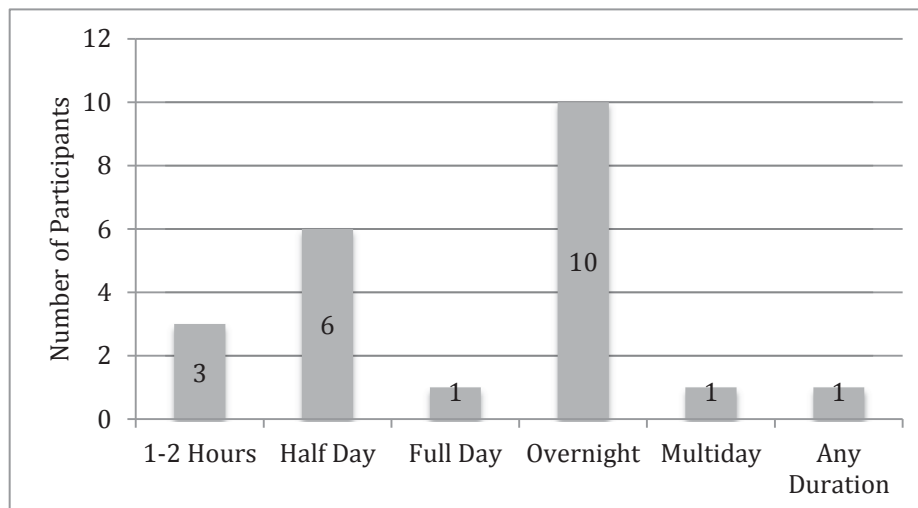
**Figure 10. Preferred Location for a Scenic Airship Service**



**4.2.4.2. Duration**

There was some debate as to what would be an appropriate duration for a scenic airship flight. A total of 13 (46.4%) participants commented as to their preferred duration. The duration categories developed out of these discussions are shown in Figure 11.

**Figure 11. Possible Durations by Number of Participants in Favour**



#### **4.2.4.3. Timing**

Two (7.1%) participants suggested that the timing of each flight would be an important determinant of whether they would purchase a flight or not.

#### **4.2.4.4. Relaxing vs. Adventurous**

Three (10.7%) participants suggested that the service should be a relaxing or tranquil experience. However, one (3.6%) participant disagreed and thought that the airship service should be adventurous instead.

#### **4.2.4.5. Nature Based**

11 (39.3%) participants suggested that they would like the service to have a major focus on observing nature. This may include flora, fauna or other natural features within the area.

#### **4.2.4.6. Environmentally Friendly**

Eight (28.6%) participants outlined that they would prefer a scenic airship service that was environmentally friendly. Participants seemed to interpret this as what was least damaging to nature (i.e. quiet around animals) and least polluting in terms of greenhouse gas emissions.

#### **4.2.4.7. Unique/Novel**

Four (14.3%) participants suggested that they thought the airship would be an attraction in of itself due to its relative novelty and uniqueness in comparison with other forms of transport (e.g. airplanes, ferries, etc.).

#### **4.2.4.8. Remote**

Five (17.9%) participants in the focus groups thought that it would be more interesting to visit and observe remote areas rather than visiting and observing non-remote areas. Participants highlighted that some attractions in New Zealand require several days of hiking and thus are difficult to access.

#### **4.2.5. Concerns**

There were some general concerns surrounding the idea of a scenic airship service. In total, 22 (78.6%) of participants raised a concern of some variety. The major areas of concern were safety (19 participants, 67.9%), security screening (two participants, 7.1%), environmental impact (six participants, 21.4%), price (six participants, 21.4%), opportunity cost (three participants, 10.7%), risk and contingency disclosure (three participants, 10.7%), disappointment (six participants, 21.4%), first aid training for staff (three participants, 10.7%) and allowing families/children on-board (seven participants, 25%).

#### **4.3. Discussion**

All ideas that were raised by the focus groups were deemed appropriate for further study in the questionnaire except for four areas. First, the idea of a scenic airship service being combined with another transport option to provide a hybrid type of service was deemed too specific to be studied further. Such a specific study would be outside the scope of this thesis and deviate somewhat from the idea of a scenic airship service presented in this thesis (i.e. transport might be the main motivation). Second, it was deemed unnecessary to study whether a toilet should be provided as this is a common courtesy that can be logically assumed (i.e. commercial aircraft provide toilets). Third, timing will not be investigated further because it is likely that such a practical consideration would prove to be true, hence why a variety of departure times are usually available for any service. Lastly, all the items listed under the uncategorised sections were ruled out due to either being impractical (i.e. unsafe, unethical, impossible), lacking consensus across participants, or being outside of the scope of this thesis.

## 5.0 Phase 2 – Questionnaire

### 5.1. Methodology

#### 5.1.1. Recruitment

Screening questions were asked to ensure that participants were aged 18 and over. Convenience sampling was used, recruiting participants from within the area shown in Appendix B – Map of Study Location. Convenience sampling may create a less generalisable sample, however, it is more pragmatic for collecting a large overview of the population within a short space of time. Demographic information was collected about gender, age, country of residence, relationship status and parental status. The required sample was 200 participants according to an a priori power analysis using a two-tailed one-sample *t*-test and a small effect size ( $d=0.2$ ,  $\alpha=0.05$ ,  $1-\beta$  error probability= $0.8$ ). For the sake of ensuring this minimum was met, this study aimed for a sample size of 300 participants.

#### 5.1.2. Process

Before starting the questionnaire, participants were shown two information sheets, which can be seen in Appendix F – Airship Information Booklet and Appendix G – Questionnaire Information Sheet. The questionnaire used a tablet computer for administration. Tablet computers have been shown to reduce the number of questions left blank by participants (Dy, Schmicker, Tran, Chadwick & Daluiski, 2012). One potential problem with using tablet computers is that respondents are more sensitive to the presentation of frequency scales and open-response boxes when compared to other means of self-administration (e.g. printed material) (Wells, Bailey & Link, 2014). To counter this, this study used QuickTapSurvey, a questionnaire application, with an iPad 2. QuickTapSurvey is a professional application and iPads are the standard platform for its use. The question types used conform with the recommendations of Wells *et al.* (2014). All questions were designed to quantify the findings from the focus groups. Several types of questions were used according to the nature of each question.

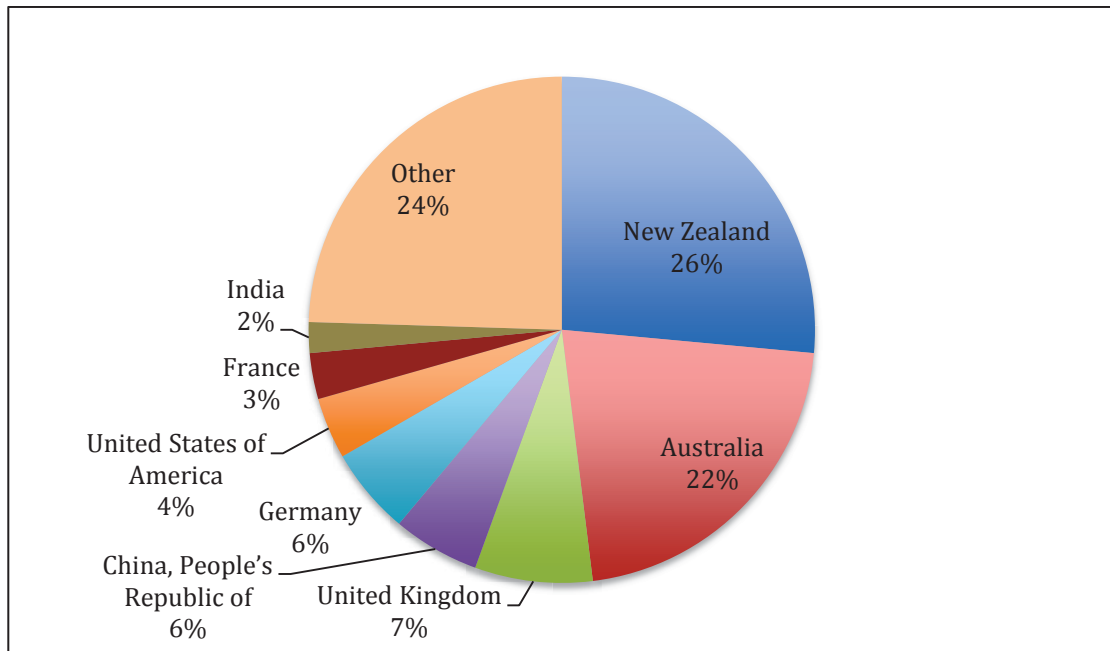
Each question type was presented differently to participants using the iPad. A full list of questions along with screenshots of how each question type was presented are shown in Appendix C – Questions and Formats for Questionnaire. It is important to note that the questionnaire was only administered in English due to the limited resources of this study. The questionnaire was piloted three times to ensure ease of completion for participants who spoke English as a second language.

## **5.2. Results**

### **5.2.1. Participants**

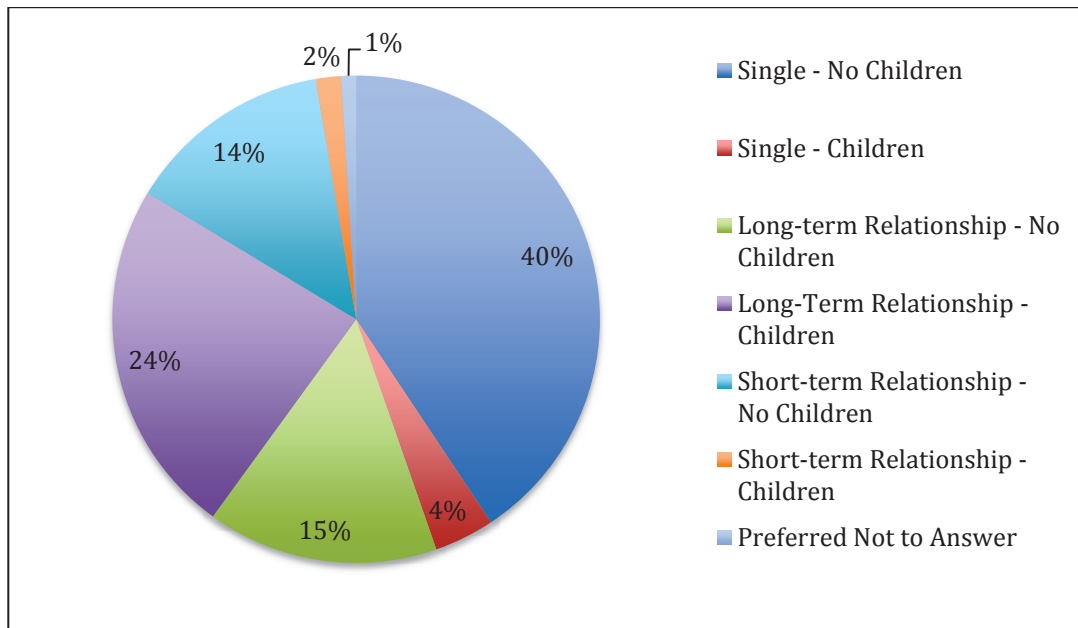
There were a total of 300 participants in the questionnaire, reaching the prescribed target. Participants were classified according to gender, age, country of residence, relationship status and parental status (whether or not they had children). 140 (47.7%) participants were male and 160 (53.3%) were female. The mean age was 36.85, with the youngest participant being 18 and the eldest being 80. There were participants from 37 different countries. A full list of countries can be viewed in Appendix E – Additional Participant Information. A simplified version is shown below in Figure 12. New Zealand participants were also asked whether they considered themselves as locals of Queenstown, 25 were locals, 56 were domestic tourists.

**Figure 12. Questionnaire Participants by Country of Residence**



The relationship status and parental status of participants were gauged in the questionnaire to see whether these affected opinions relating to facilities and children being allowed on-board of the airship. There were 134 (44.7%) single participants, 104 (34.7%) married participants, one (0.3%) in a civil union, 12 (4%) in de facto relationships, 46 (15.3%) participants in a relationship not further specified and three (1%) participants that abstained from answering this question. To simplify results, married, civil union and de facto participants were categorised into long-term relationships, with single forming its own category and in a relationship being interpreted as meaning a short-term relationship. 90 (30%) participants had children while 210 (70%) did not. Relationship status and parental status are combined in Figure 13.

**Figure 13. Questionnaire Participants by Relationship Status and Parental Status**



### **5.2.2. Overall Findings**

The overall findings from the questionnaire are shown in Table 6. For each study item, either the number of participants (with percentage) in favour or the mean agreement score from the corresponding question is shown. Results from the corresponding chi-squared goodness-of-fit tests and the single sample *t*-tests are shown under the statistics column. The statistics indicate the strength of the preference or concern towards a particular study item. For some study items, participants who had answered in favour were then asked some kind of follow up question. The results from these follow up questions are shown under the subcategories column. Lastly, if any statistically significant demographic associations were found, then these are shown in the associated demographics column. The direction of the relationship between study items and demographic variables is shown as either positive (+) or negative (-). Men (M) were used as the basis for comparison for gender and those with children (C) were used as the basis for comparison for parental status. The direction for age indicates what effect each added year of age has on how participants viewed the particular study item. Direction could not be shown for relationship status because this variable is measured using multiple nominal categories.

**Table 6. Questionnaire Results**

Study Items	Participants in Favour / Mean Agreement Score	Statistics	Subcategories	Associated Demographics
<b>Activities</b>				
Food and Drink	285 (95%)	$\chi^2 (1) = 243.000^{***}$	Restaurant (150), Café (239), Buffet (77), Bar (175), Other (2)	Not tested <sup>a</sup>
Adventure Activities	150 (50%)	$\chi^2 (1) = 0$	Bungee jumping (106), Abseiling (50), Hanging in a Basket or Gondola (84), Skydiving (113), Other (4)	Age (-) <sup>***</sup> , Gender (M+) <sup>***</sup> , Parental Status (C-) <sup>*** r</sup>
Educational Activities	286 (95.3%)	$\chi^2 (1) = 246.613^{***}$	History (239), Geology/Geography (206), Astronomy (93), Film Locations (90), Culturally Significant Sites (183), Airship Technology (117), Ecology (149), Other (3)	Not tested <sup>a</sup>
General Commentary	265 (88.3%)	$\chi^2 (1) = 176.333^{***}$	-	Not tested <sup>b</sup>
Overnight Stay	132 (44%)	$\chi^2 (1) = 4.320^*$	On-board (96), In a Lodge/Resort (56), in a Hut/Cabin (35)	None <sup>r</sup>
Private Functions	204 (68%)	$\chi^2 (1) = 38.880^{***}$	-	Not tested <sup>b</sup>
Musical Performances	156 (52%)	$\chi^2 (1) = 0.480$	Band (28), jazz (27), Live (25), Rock (13), Classical (12), Concert (10), Other (97)	Age (-) <sup>**</sup> , Relationship Status <sup>** r</sup>
Stopping Off	204 (68%)	$\chi^2 (1) = 38.880^{***}$	Picnicking (87), Walking/Tramping (134), Interacting with Wildlife (131), Visiting Remote Areas (159), Skiing/Sports (83), Other (3)	Parental Status (C-) <sup>*** chi</sup>
<b>Airship Design</b>				
Transparent Floor	274 (91.3%)	$\chi^2 (1) = 205.013^{***}$	-	Not tested <sup>b</sup>
Viewing Devices	273 (91%)	$\chi^2 (1) = 201.720^{***}$	-	Not tested <sup>b</sup>
Private Areas	170 (56.7%)	$\chi^2 (1) = 5.333^*$	-	Not tested <sup>b</sup>
Outside Area	223 (74.3%)	$\chi^2 (1) = 71.053^{***}$	-	Not tested <sup>b</sup>
Major Design Features	See Table 7 for Rank Order Statistics		Viewing Area/Observation Deck (284), Spacious Cabin Area (199), Spa/Pool (62), Casino (15), Library/Reading Area (29), Entertainment Room (51)	Not tested <sup>c</sup>
Dividing the Airship into Different Areas	M = 3.81 (SD = 0.769) Mode = Agree	t (299) = 18.170 <sup>***</sup>	-	None <sup>l, chi</sup>
Modern vs. Traditional	M = 3.92 (SD = 0.810) Mode = Agree	$\chi^2 (4) = 151.750^{***}$ t (299) = 19.677 <sup>***</sup>	-	Gender (M+) <sup>*</sup> , Parental Status (C*) <sup>*** chi</sup>
Interactive Information Facilities	222 (74%)	$\chi^2 (1) = 69.120^{***}$	-	Not tested <sup>b</sup>
Wireless Internet	199 (66.3%)	$\chi^2 (1) = 32.013^{***}$	-	Age (-) <sup>*** r</sup> , Parental

		Nature of the Experience		Status (C+) ** chi
Duration	N/A	N/A	1 - 2 Hours (193), Half Day (208), Full Day (44), Overnight (56), Multi Day (22)	Not tested <sup>c</sup>
Relaxing vs. Adventurous	M = 2.95 (SD = 1.084) Mode = Neutral	N/A	t (299) = -0.746 χ <sup>2</sup> (4) = 74.733***	Relationship Status** chi
Nature-Based	M = 4.41 (SD = 0.666) Mode = Strongly Agree	N/A	t (299) = 36.677*** χ <sup>2</sup> (3) = 217.680***	Age (+)* <sup>1</sup>
Environmentally Friendly	266 (88.7%)	N/A	χ <sup>2</sup> (1) = 179.413***	Gender (M-)* <sup>1</sup> chi
Unique/Novel	M = 4.27 (SD = 0.712) Mode = Agree	N/A	t (299) = 31.361*** χ <sup>2</sup> (3) = 181.307***	None <sup>1</sup> , chi
Remote	M = 4.27 (SD = 0.662) Mode = Agree	N/A	t (299) = 33.216*** χ <sup>2</sup> (3) = 207.600***	None <sup>1</sup> , chi
<b>Concerns</b>				
General Concerns	N/A	N/A	Safety (241), Passenger Security Checks (118), Environmental Impact (127), Price (224), None (3), Other (2)	Not tested <sup>c</sup>
Government Approval	228 (93.8%) <sup>#</sup>	N/A	χ <sup>2</sup> (1) = 186.704***	Not tested <sup>a</sup>
Opportunity Cost	M = 2.61 (SD = 0.903) Mode = Disagree	N/A	t (299) = 7.548*** χ <sup>2</sup> (4) = 224.733***	None <sup>1</sup> , chi
Disappointment	M = 3.79 (SD = 1.012) Mode = Agree	N/A	t (299) = 13.461*** χ <sup>2</sup> (4) = 155.200***	Age (-)*** <sup>1</sup> , Parental Status (C+)** <sup>1</sup> chi
Disclosure	M = 4.13 (SD = 0.794) Mode = Agree	N/A	t (299) = 24.712*** χ <sup>2</sup> (4) = 263.067***	None <sup>1</sup> , chi
First Aid Training	273 (91%)	N/A	χ <sup>2</sup> (1) = 201.720***	None <sup>r</sup>
Acceptability of Children and Families	22 (7.3%)	N/A	χ <sup>2</sup> (1) = 218.453***	Gender (M-)** <sup>1</sup> chi

Note: Significance levels denoted by, \* p ≤ 0.05, \*\* p ≤ 0.01, \*\*\* p ≤ 0.001.

<sup>a</sup> Not tested due to having greater than 90% support.

<sup>b</sup> Not tested due to the relative unimportance of demographic differences in the given variable.

<sup>c</sup> Not tested because the type of data collected does not allow for testing whether demographics are associated with answers.

<sup>r</sup> Tested using a binomial logistic regression.

<sup>1</sup> Tested using a simple linear regression.

<sup>chi</sup> Tested using a chi-squared test for independence.

<sup>#</sup> Out of the 241 participants who were concerned by safety.

**Table 7. Ranking Order of Major Design Features with Z-values**

	Viewing Area	Spacious Cabin	Spa/Pool	Casino	Library
Spacious Cabin	-10.310*				
Spa/Pool	-14.217*	-11.890*			
Casino	-15.012*	-14.349*	-9.978*		
Library	-14.655*	-13.076*	-0.057	-8.922*	
Entertainment Room	-14.162*	-11.098*	-1.997	-10.816*	-2.535

*Note:* \* denotes statistical significance at the corrected level.

The results in Table 7 show that participants ranked the facilities for a scenic airship service in the following order of importance:

1. Viewing area/observation deck
2. Spacious cabin area
3. Spa/pool facilities, library/reading area and entertainment room (TV, games)
4. Casino

### **5.3. Discussion**

It is interesting to note that every variable that was raised in the focus groups received at least some support from the wider population during the questionnaire. The results from the questionnaire allow for certain features to be prioritised and certain concerns to be addressed. Accordingly, the questionnaire data was used to design an appropriate hypothetical offering in order to measure consumer interest (in terms of pricing and demand) towards scenic airship services in Queenstown, New Zealand.

## **6.0 Phase 3 – Market Evaluation**

### **6.1. Methodology**

Instead of forming a decision model based on the results of the questionnaire, this study heeded the critiques of decision modelling (see the Literature Review section) and instead looked to form a descriptive model of what effects pricing and demand for scenic airship services. In other words, this study was not concerned with what consumers *should* think with regards to pricing and demand, but rather what they *do* think and *why* they think it.

#### **6.1.1. Recruitment**

Screening questions were asked to ensure that participants were aged 18 and over. Convenience sampling was used, recruiting participants from within the area shown in Appendix B – Map of Study Location. Convenience sampling may create a less generalisable sample, however, it is more pragmatic for collecting a large overview of the population within a short space of time. Demographic information was collected about gender, age, country of residence, relationship status and parental status. Due to the large weighting of this section towards qualitative data, a slightly smaller sample size of 200 participants was aimed for.

#### **6.1.2. Process**

Participants were first shown an information booklet (see Appendix H – Market Evaluation Information Booklet), which contained crucial information about the two scenic airship services that participants were to consider. Option 1 was a 3 ½ hour sightseeing service that included a meal and a drink and Option 2 was an all-inclusive overnight service (see full details in Appendix H). Only two options were developed in order to keep the time for participants to complete the market evaluation to a minimum

Participants were shown a short video of the airship that would be used for both options. It has been shown that concept testing using virtual prototypes of products in the form of video animations is a good substitute for physical prototypes (Dahan & Srinivasan, 2000). Snapshots of the video are shown in Appendix D – Snapshots of Video Shown to Market Evaluation Participants. Participants were asked how much they thought would be a fair price for each option, why and whether they would purchase each option for that price and why. The airship model used in the market evaluation was chosen because it best matched the results of the focus groups and questionnaire. The airship model is called the Aether Concept. Written permission was received from the designer to reproduce his video for the purposes of this research. It is important to note that the market evaluation was only administered in English due to the limited resources of this study. The market evaluation was piloted twice to ensure ease of completion for people who spoke English as a second language.

## **6.2. Results**

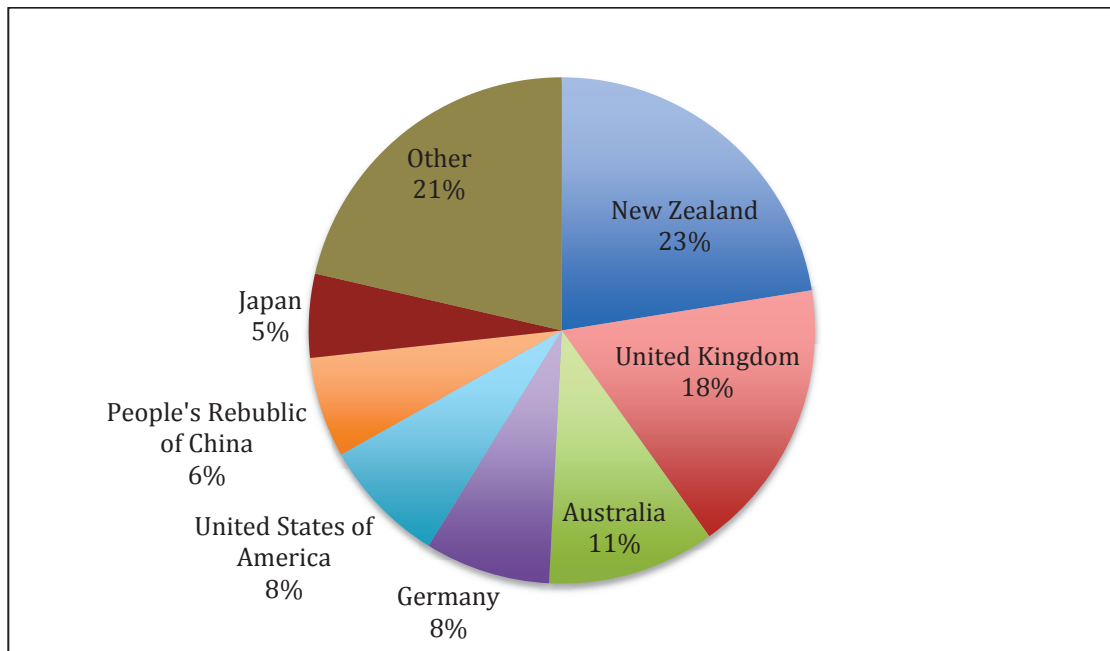
### **6.2.1. Participants**

There were a total of 187 participants for the market evaluation. This was slightly short of the target of 200 participants due to an unexpected situation involving the researcher. 68 (36.4%) participants were male and 119 (63.6%) were female. The mean age of participants was 34.1 years, with the youngest participant being 18 and the eldest being 76. There were participants from 32 different countries. A full list of countries can be viewed in Appendix E – Additional Participant Information. A simplified version is shown in Figure 14.

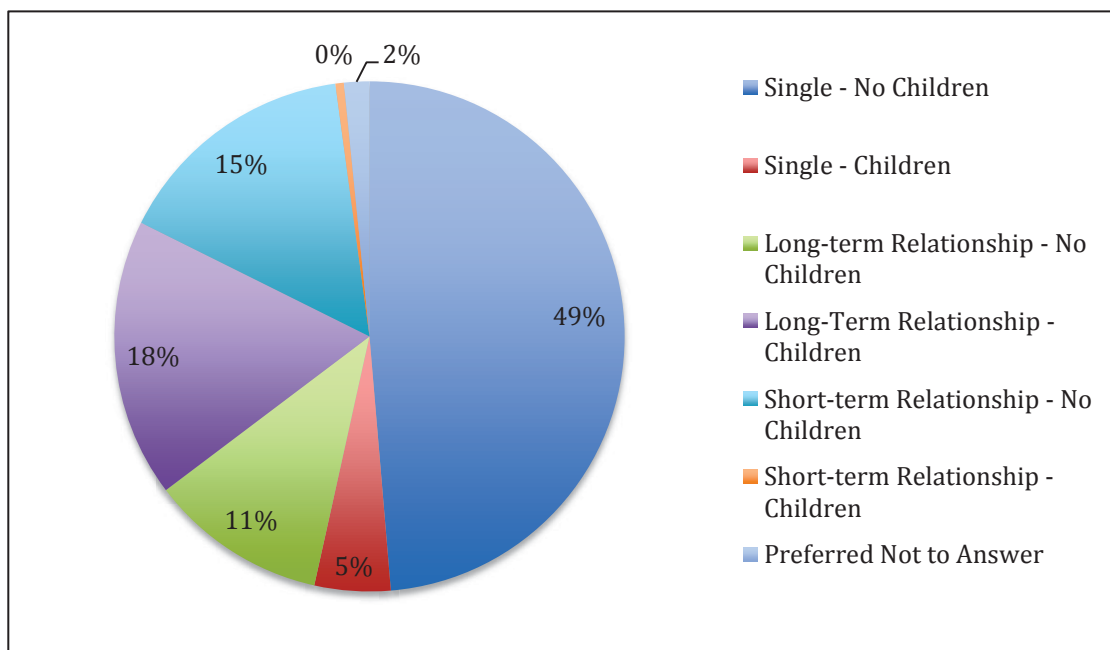
The relationship status and parental status of participants were assessed in the market evaluation to see how these factors affected participants' answers. There were 100 (53.5%) single participants, 50 (26.7%) married participants, no participants in a civil union, four (2.1%) in de facto relationships, 30 (16%) participants in a relationship not further specified and three (1.6%) participants that abstained from answering this question. To simplify results, married, civil

union and de facto participants were categorised into long-term relationships, with single forming its own category and in a relationship being interpreted as meaning a short-term relationship. 44 (23.5%) participants had children while 143 (76.5%) did not. Relationship status and parental status are combined in Figure 15.

**Figure 14. Market Evaluation Participants by Country of Residence**



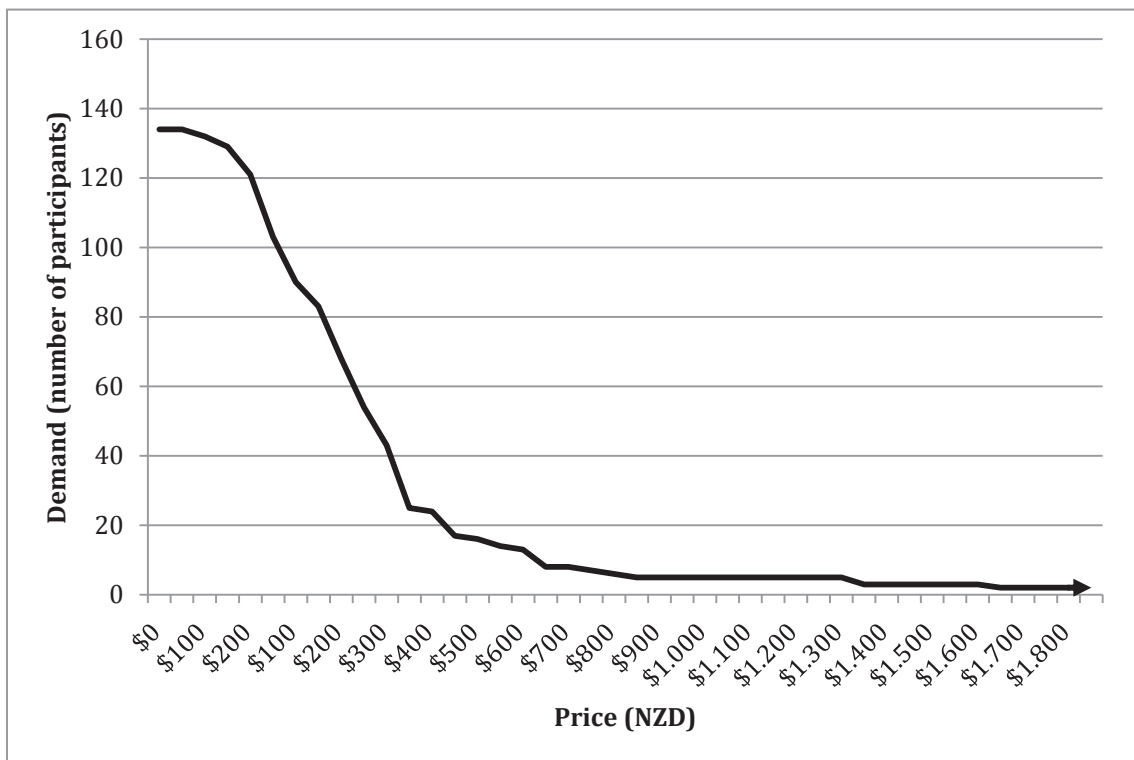
**Figure 15. Market Evaluation Participants by Relationship Status and Parental Status**



### 6.2.2. Option 1 – Sightseeing Tour (3 ½ hours, one meal and drink)

Due to a number of extreme values for price (range: NZ\$89-NZ\$130,000), a median has been used as a measure of central tendency rather than a mean. The median price for Option 1 was \$400, with an interquartile range between NZ\$250 and NZ\$500. 134 (71.7%) participants would pay their given price, while 53 (28.3%) would not. A representation of the price-demand curve for this product is shown in Figure 16.

**Figure 16. Price-Demand Curve for Option 1**



#### 6.2.2.1. Determinants of Fair Price

For a full list of determinants, with explanations, numbers and rankings, refer to Appendix I – Fair Price Determinants. Table 8 shows the key determinants (those mentioned by four or more participants) separated into categories.

**Table 8. Key Determinants of Fair Price for Option 1**

<b>Category</b>	<b>Key Determinants</b>
Activities	<ul style="list-style-type: none"> <li>• Food and Drink</li> <li>• What's Included (other than food or drink)</li> </ul>
Airship Design	<ul style="list-style-type: none"> <li>• Amenities/Technology/Facilities</li> </ul>
Nature of the Experience	<ul style="list-style-type: none"> <li>• Duration</li> <li>• Location</li> <li>• Scenery/Views</li> <li>• Uniqueness/Novelty</li> <li>• Luxury</li> <li>• Airship Experience</li> <li>• Comfort</li> </ul>
Related Products	<ul style="list-style-type: none"> <li>• Helicopter or Small Aircraft Flight</li> <li>• Alternatives (not otherwise specified)</li> <li>• Adventure Activities</li> <li>• Tourist Activities</li> <li>• Airline Flight</li> <li>• Cruise</li> <li>• Boat Ride</li> </ul>
Price Perception	<ul style="list-style-type: none"> <li>• Affordability</li> <li>• Willingness to Pay</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Guess</li> <li>• Assumed Costs and Profits</li> <li>• Intuitively Fair or Reasonable</li> <li>• Assumed Competition</li> </ul>

**6.2.2.2. Determinants for Choosing to Purchase Option 1**

For a full list of determinants, with explanations, numbers and rankings, refer to Appendix J – Determinants for Choosing to Purchase. Table 9 shows the key determinants (those mentioned by four or more participants) separated into categories.

**Table 9. Key Determinants for Choosing to Purchase Option 1**

Category	Key Determinants
Activities	<ul style="list-style-type: none"> <li>• Food and Drink</li> </ul>
Airship Design	<ul style="list-style-type: none"> <li>• Amenities/Technology/Facilities</li> <li>• Design of Airship</li> <li>• Futuristic/Modern</li> </ul>
Nature of the Experience	<ul style="list-style-type: none"> <li>• Uniqueness/Novelty</li> <li>• Airship Experience</li> <li>• Scenery/Views</li> <li>• Duration</li> <li>• Location</li> <li>• Interesting</li> <li>• Environmentally Friendly</li> <li>• Cool</li> <li>• Quiet or Relaxing</li> <li>• Fun</li> <li>• Comfort</li> </ul>
Related Products	<ul style="list-style-type: none"> <li>• Prefer Airship over Other Transport</li> </ul>
Price Perception	<ul style="list-style-type: none"> <li>• Fair Price</li> <li>• Value for Money</li> </ul>

**6.2.2.3. Determinants for Choosing Not to Purchase Option 1**

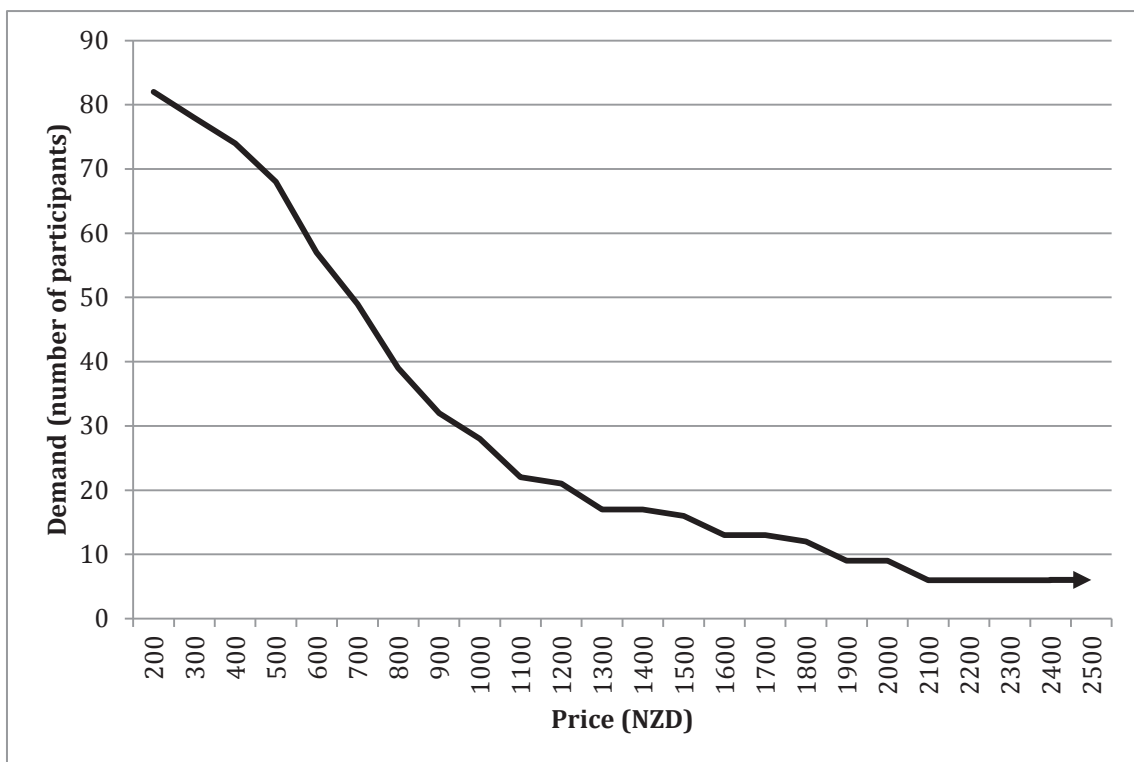
For a full list of determinants, with explanations, numbers and rankings, refer to Appendix K – Determinants for Choosing Not to Purchase. There were only four key determinants (those mentioned by four or more participants) for choosing not to purchase Option 1, these were:

- Financial Status
- Not Interested
- Cost
- Opportunity Cost

### 6.2.3. Option 2 – Overnight Stay (all-inclusive)

Due to a number of extreme values for price (range: NZ\$200-NZ\$400,000), a median has been used as a measure of central tendency rather than a mean. The median price for Option 2 was NZ\$900, with an interquartile range between NZ\$600 and NZ\$1500. 82 (43.9%) participants would pay their given price, while 105 (56.1%) would not. A representation of the price-demand curve for this product is shown in Figure 17.

Figure 17. Price-Demand Curve for Option 2



#### 6.2.3.1. Determinants of Fair Price

For a full list of determinants, with explanations, numbers and rankings, refer to Appendix I – Fair Price Determinants. Table 10 shows the key determinants (those mentioned by four or more participants) separated into categories.

**Table 10. Key Determinants of Fair Price for Option 2**

<b>Category</b>	<b>Key Determinants</b>
Activities	<ul style="list-style-type: none"> <li>• Food and Drink</li> <li>• Overnight Stay</li> <li>• What’s Included (other than food or drink)</li> </ul>
Airship Design	<ul style="list-style-type: none"> <li>• Amenities/Technology/Facilities</li> <li>• Modern/Futuristic</li> </ul>
Nature of the Experience	<ul style="list-style-type: none"> <li>• Duration</li> <li>• Uniqueness/Novelty</li> <li>• Airship Experience</li> <li>• Scenery/Views</li> <li>• Up-Market/High-End</li> <li>• Luxury</li> <li>• Location</li> <li>• Quality</li> <li>• Service Quality</li> </ul>
Related Products	<ul style="list-style-type: none"> <li>• Accommodation</li> <li>• Option 1</li> <li>• Alternatives (not otherwise specified)</li> <li>• Cruise</li> <li>• Airline Flight</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Assumed Costs and Profits</li> <li>• Guess</li> <li>• Intuitively Fair/Reasonable</li> </ul>

**6.2.3.2. Determinants for Choosing to Purchase Option 2**

For a full list of determinants, with explanations, numbers and rankings, refer to Appendix J – Determinants for Choosing to Purchase. Table 11 shows the key determinants (those mentioned by four or more participants) separated into categories.

**Table 11. Key Determinants for Choosing to Purchase Option 2**

Category	Key Determinants
Activities	<ul style="list-style-type: none"> <li>• Food and Drink</li> <li>• What's Included (other than food or drink)</li> </ul>
Nature of the Experience	<ul style="list-style-type: none"> <li>• Airship Experience</li> <li>• Scenery/Views</li> <li>• Uniqueness/Novelty</li> <li>• Comfort</li> <li>• Duration</li> <li>• Overnight</li> </ul>
Price Perception	<ul style="list-style-type: none"> <li>• Fair/Reasonable Price</li> </ul>

### **6.2.3.3. Determinants for Choosing Not to Purchase Option 2**

For a full list of determinants, with explanations, numbers and rankings, refer to Appendix K – Determinants for Choosing Not to Purchase. The key determinants (those mentioned by 4 or more participants) for choosing not to purchase Option 2 were:

- Financial Status
- Cost
- Not Interested
- Opportunity Cost
- Prefer Option 1
- Overnight Stay is Redundant
- Duration

### **6.2.4. Adventure Activities**

It was clear that bungy jumping and skydiving were the two most popular adventure activities that participants wanted to undertake in the questionnaire. Accordingly, prices for both bungy jumping and skydiving were taken from prominent providers of those services in Queenstown and used to devise questions. Participants were asked, “Would you pay NZ\$350 extra to skydive from 12000 feet at the end of either option?” and “Would you pay NZ\$200 extra to bungy jump from the airship as part of either option?” as ‘Yes’ or ‘No’

questions. It was assumed that if those providers already charged similar prices, then the above prices are theoretically reasonable. 94 (50.3%) participants would pay NZ\$350 extra to skydive from 12000 feet at the end of either option, while 93 (49.7%) of participants would not. The numbers were less for bungy jumping, where 65 (34.8%) participants would pay NZ\$200 extra to bungy jump from the airship as part of either option. These results suggest that demand for adventure activities in the airship does indeed exist.

A binomial logistic regression was performed to ascertain the effects of age on the likelihood that participants would want to either skydive or bungy jump as part of either option. A test of the model against a constant only model was statistically significant, indicating that age distinguishes between those who want to undertake skydiving ( $\chi^2 = 20.807, p < 0.001$  with  $df = 1$ ) or bungy jumping ( $\chi^2 = 19.804, p < 0.001$  with  $df = 3$ ) and those who do not. Nagelkerke's  $R^2$  of 0.140 (skydiving) and 0.139 (bungy jumping) indicated a very weak relationship between prediction and grouping. Prediction success overall was 63.1% for skydiving (43% for no and 83% for yes) and 66.8% for bungy jumping (95.9% for no and 12.3% for yes). The Wald criterion demonstrated that age made a significant contribution to prediction ( $p < 0.001$ ). Exp(B) values indicate that every additional year of age results in a 5.1% decrease in likelihood of wanting to skydive at the end of either option and every additional year of age results in a 5.9% decrease in the likelihood of wanting to bungy jump as part of either option.

A chi-square test of independence was performed to assess the effects of gender, relationship status and parental status on the likelihood that participants would want to either skydive or bungy jump as part of either option. Unlike in the questionnaire, gender was not significantly associated with the likelihood of wanting to undertake skydiving ( $\chi^2 (1) = 1.617, p = 0.226$ ) or bungy jumping ( $\chi^2 (1) = 0.708, p = 0.429$ ) as part of either option. However, relationship status and parental status were significantly associated with the likelihood of wanting to undertake skydiving ( $\chi^2 (1) = 8.658, p = 0.013$ ;  $\chi^2 (1) = 6.032, p = 0.049$  respectively) or bungy jumping ( $\chi^2 (1) = 12.170, p < 0.001$ ;  $\chi^2 (1) = 5.192, p =$

0.023 respectively) as part of either option. These tests reveal that single people are more likely to want to undertake skydiving or bungy jumping than people in short-term or long-term relationships and people without children are more likely to want to undertake skydiving or bungy jumping than people with children.

#### **6.2.5. Uncategorized**

At the end of the market evaluation, participants were asked, “Is there anything else that you would like to add?” as a qualitative question. Some participants interpreted this as meaning whether they wanted any additional activities, services or facilities. Because their ideas were not quantified during the questionnaire, it is not known whether their comments are generalisable or not. The following additional activities and services were suggested in the market evaluation:

- Something that is attractive for kids and the whole family (not further specified): This comment suggests that the product shown in the market evaluation was not an attractive prospect for children and families in this participant’s mind.
- Exterior cameras for taking souvenir photos: It is interesting that this is suggested again, however, exterior cameras may be unsafe (especially if near moving parts or mooring points) and if photos are taken without asking passenger’s permission, there may be issues of privacy infringement.
- Beauty/Massage options: A viable suggestion at face value if demand exists for such a service.
- Leasing rooms long-term: This may be feasible, however, this would be more of a hospitality service rather than a scenic service.
- “Some sort of corresponding show” (not otherwise specified): Theoretically, because consumers were interested in musical performances, there may also be interest in other forms of performance.

- “A certificate or small gift as a souvenir for the flight”: This idea seems feasible and could be provided for passengers provided that they are interested in it.
- A brothel: This is likely not generalisable due to moral issues associated with prostitution (similar to what was observed with casinos). If a brothel were to be included on-board, passengers would have to be aged 18 and above, ruling out the market segment with children under this age. However, it may be possible to allow passengers to bring a prostitute on board as part of Option 2, which includes private areas for passengers,
- Smoking area: This would not be allowed due to safety concerns. If the airship had a capacity for more than 90 passengers, lighters would also be banned for security reasons. While this may put smokers off flying on the service, a smoking area cannot be provided due to current regulatory provisions.
- Transparent roof: This may be possible in a small section, however, it is not possible under any current airship design because the buoyant lift must always come from above (i.e. the gas bags must be above the cabin). A section made with transparent gasbags and exterior skin may be possible, but this is beyond the scope of this study. Three different participants suggested this idea.

### **6.3. Discussion**

The results from the market evaluation show that there is substantial interest (71.7% of participants for Option 1, and 43.9% for Option 2) for scenic airship services at certain prices (median = NZ\$400 for Option 1, and NZ\$900 for Option 2). More importantly, consumers’ reasons for making their pricing and purchase decisions have been extrapolated so that a descriptive model can be made. In most places these reasons align with the results from the focus groups and the questionnaire, however, there are some major differences (e.g. the absence of environmental concern). These will be elaborated upon in the general discussion. The importance of adventure activities as a potential source of ancillary revenue was also shown during the market evaluation, with roughly

half of the participants will to spend additional money in order to skydive or bungee jump as part of either option.

## **7.0 General Discussion**

### **7.1. Activities**

#### **7.1.1. Food and Drink**

This study has shown the clear importance of food and drink. It was suggested by a majority of focus group participants and 95% of participants in the questionnaire expected food and drink to be served on-board. The market evaluation also showed the importance of food and drink in determining fair price and deciding whether or not to purchase the product. This shows that food and drink is an important supporting experience. Parallels of food and drink being used as a supporting experience are seen in the airline industry, where food is frequently an evaluation component of airline service quality (An & Noh, 2009; Feng & Jeng, 2005; Tsaur, Chang & Yen, 2002).

In the airline industry it has also been observed that different classes of passengers have different service quality factors with relation to food and drink. For business class passengers, alcoholic and non-alcoholic beverages are the most important in-flight service determinant, with food quality in second and the presentation style of food in fifth (An & Noh, 2009). For economy class passengers, alcoholic and non-alcoholic beverages were the second most important item with food quality in third (An & Noh, 2009). However, the findings from this study were based on respondents travelling on a Korean airline and thus may not be generalisable to Western consumers that predominate the Queenstown tourism industry. Nonetheless, the focus group and questionnaire participants showed differences in food preference, despite largely agreeing that food needed to be served on-board. In Turkey, Yüksel and Yüksel (2003) found that tourist satisfaction with restaurant services depended upon whether the tourist was a service seeker, a value seeker, an adventurous food seeker or an atmosphere seeker, where the number and types of service factors varied in importance across these four segments. The findings of this

thesis also show some segmentation across consumer's preferences with regard to food and drink.

### **7.1.2. Adventure Activities**

Adventure activities are becoming increasingly popular in the tourism industry, with growth rates of roughly 15% per annum up until 2006 worldwide (Buckley, 2007). The desire to undertake adventure activities has been shown to be dependent on the desire to experience 'rush' rather than 'risk', despite adventure activities often being risky in nature (Buckley, 2012). Rush has been shown to be a function of flow and thrill, however, acknowledging that most people say that rush is 'indescribable' (Buckley, 2012). Flow can be broadly defined as an instance where mental focus coincides with physical activity so that one becomes intensely absorbed within that activity (Heo, Lee, McCormick & Pedersen, 2010). Flow is closely related to skill, in that one must have enough skill to become intensely absorbed within an activity. Because of flow's subjective nature, it is not limited to adventure activities, but can also be experienced by musicians, professional athletes, etc. Thrill, on the other hand, refers to a "purely adrenalin-based physiological response" that is unrelated to the skill of the person performing the physical activity (Buckley, 2012, p. 963). Another study showed that intention to undertake adventure activities was related to (1) satisfaction from previous adventure activity experiences, (2) value for money of the adventure activity and (3) the emotional value to the person undertaking the adventure activity (Williams & Soutar, 2009). Interestingly, the novelty value of an adventure activity was not significantly related to intention to undertake an adventure activity (Williams & Soutar, 2009).

The results of this thesis show that 50% of participants in the questionnaire and market evaluation would want to undertake adventure activities. This is consistent with the finding that approximately half of American adults had taken an adventure-based vacation in the years 1995-2000 (Tsui, 2000). However, the influence of age and gender found in this study conflicts with the meta-analysis

of Buckley (2012) that found no apparent pattern between motivation to undertake adventure activities and age or gender.

### **7.1.3. Educational Activities**

This thesis showed that over 95% of participants would like to learn about the area that they are flying over. A number of different areas of learning were proposed by the focus groups and examined in the questionnaire. In the 1980s and 1990s Krippendorf (1986) and Poon (1993) recognised a shift in the thinking of tourists away from travelling purely for relaxation into more complex and intelligent tourists who travel to learn about history, culture and wildlife among other things. Several studies have also demonstrated this shift in the thinking of tourists from a focus on relaxation to a focus on learning. For example, Lück (2015) found that tourists on whale and dolphin tours in New Zealand would like to learn more about wildlife and the sea in general. Another area of tourism, known as dark tourism, demonstrates that some tourists travel primarily for educational purposes. In dark tourism, tourists visit sites with dark histories such as those where deaths and suffering have taken place (Hartmann, 2014). Such examples may include visiting former concentration camps or churches used during the Inquisition. Stone (2006) showed that there is a spectrum of motivations associated with dark tourism, where the darker the attraction, the greater the motivation is oriented towards education. These studies demonstrate that education can be an important aspect of tourism for the modern tourist.

There is also an interesting parallel between wanting to undertake educational activities and the knowledge scale items of the memorable experience scale developed by Kim *et al.* (2012). Learning seems to be an important aspect of the memorable experience for most consumers as well as the participants in this study. Learning was also shown by Park and Yoon (2009) to be one of the primary motivations for rural tourists to travel. Similar activities can also be observed in the airship service offering of Zeppelin NT, which offers heritage flights combined with shipyard tours for passengers to learn about the

technology of the airship and the history behind the Zeppelin name. Certainly, this study has shown that a scenic airship service would need to provide educational activities to satisfy the needs of most consumers. This study also acts to verify in the tourism literature the importance of learning and educational activities as part of the overall tourist experience.

#### **7.1.4. Airship Specific Activities – Overnight Stay, Use as Venue and Stopping Off**

This study showed that a large segment of participants wanted to stay overnight on-board the airship in the focus groups, questionnaire and market evaluation. It also showed that a majority of participants supported the idea of using the airship as a venue for private functions or musical performances and the idea of stopping off along the way to undertake various activities (e.g. picnicking or tramping). These findings, however, do not relate to prior literature because they are so specific in nature to the scenic airship service. Accordingly, there are no general principles for discussion from these results.

## **7.2. Airship Design**

### **7.2.1. Aesthetics**

This study found that aesthetics was an important aspect for some participants in the market evaluation. This finding reinforces the call of Bushnell (2006) for aeronautical engineers to consider aesthetics when designing aircraft and spacecraft. Currently, function, production and value take greater precedence when designing aeronautical products and when appearance is included, it is usually limited to only the cabin and flight deck of the aircraft rather than the exterior (Bushnell, 2006). The findings of this study also align from literature in other disciplines. For example, in retail environments, a major component that consumers use to assess service quality is tangibles, which consists of the appearance of physical facilities, equipment, personnel and communication materials (Parasuraman, Berry & Zeithaml, 1991; Parasuraman & Grewal, 2000).

### **7.2.2. Modern vs. Traditional Designs**

This study showed that a clear majority of consumers prefer modern airship designs over traditional airship designs. A search of the literature proved unfruitful in finding similar findings in other industries. However, this finding may make sense when given several logical explanations. The first relates to the previous section, aesthetics. It is plausible that modern airship designs are simply more pleasing to the eye than traditional airship designs. The second relates to the desire to be at the forefront of new technology. This has been observed in the aviation industry with New Zealand travellers being more likely to request flights on Airbus A380s and Boeing 787s (both the newest aircraft of the respective manufacturers) than other aircraft during their international trips (Gibson, 2015). Singapore Airlines also noted large increases in passenger numbers following the introduction of the Airbus A380 (Heracleous & Wirtz, 2014). Similarly, the adoption of hyped technologies, those that receive significant media attention upon introduction, is driven by emotional, epistemic and social value derived from the new product (Hedman & Gimpel, 2010). It is possible that the world's first passenger service on a new airship type would be a hyped product. Certainly, the release of the HAV Airlander 10 has received significant media attention (for example, Neild & Delgrossi, 2016; "World's largest aircraft stands ready for sales," 2016).

Lastly, the drive towards modern airship designs may be due to associations of traditional designs with historical accidents such as the Hindenburg Disaster. It is well documented within the psychological literature that past memories of trauma may be recalled by new experiences, which serve as a reminder of the past trauma (Ursano, Fullerton & McCaughey, 2001). Widespread media coverage (as was experienced with the Hindenburg Disaster) can form traumatic memories even for those who were not directly impacted by a disaster (Ursano *et al.*, 2001). The general principle is that modern airship designs look more appealing than traditional airship designs and logically this tendency could be explained by aesthetics, new/hyped technology and/or associating traditional airship designs with past traumatic events.

### **7.2.3. Wireless Internet and Social Media**

The importance of Wireless Internet was emphasised in the focus groups and in the questionnaire, respectively. During the focus groups, the main motivation was being able to use social media, such as Facebook, Twitter or Instagram while on-board the scenic airship service. In 2009, 55% of Americans aged 18-29 and 30% of adults aged 30 and above connected to the internet wirelessly using a cell phone or handheld device (Lenhart, Purcell, Smith & Zickuhr, 2010). Gender, education and income effected the use of wireless internet where men, those with higher educational attainment and those with higher income were more likely to access the internet wirelessly (Lenhart *et al.*, 2010). It is interesting that this thesis, while finding differences according to age, did not replicate the finding of men being more likely to want wireless internet. It is a possibility that this finding of Lenhart *et al.* (2010) was specific only to Americans, rather than generalisable to other cultures and nationalities. Whiting and Williams (2013) found that there were 10 major reasons why people use social media, which may help to explain the findings of this study. The primary reasons were (in order of magnitude): (1) social interaction; (2) information seeking; (3) pass time; (4) entertainment; (5) relaxation; (6) expression of opinions; (7) communicatory utility; (8) convenience utility; (9) information sharing; and (10) surveillance/knowledge about others (Whiting & Williams, 2013). These reasons align with the narrative of the focus group participants as well as the results from the questionnaire in terms of wanting wireless internet on-board.

### **7.2.4. Servicescape**

This study has shown a variety of facilities are desired as part of a scenic airship service. Instead of discussing each type of facility separately, this study would argue that they combine to provide a single desired servicescape. This would be similar to the findings of Kwortnik (2008) in relation to the impact of facilities upon the servicescape of cruise ships. While this study did not examine the response of participants to different design stimuli, the responses shown in Kwortnik's (2008) servicescape model for cruises could logically explain why participants indicated interest in their given facilities and design features. In fact,

the physiological responses (e.g. relaxation and comfort) and the emotional responses (e.g. enjoyment), shown in Kwortnik's (2008) model are similar to the responses observed in the market evaluation as justification for purchase. Accordingly, in addition to Kwortnik's (2008) evidence that servicescape causes behavioural responses such as repurchase, complaints and praise, it appears that perceived servicescape also has an influence on initial purchase decisions. The experiential and symbolic responses were not directly observed in relation to the facilities of airships in this thesis, however it is possible that these responses to the servicescape also influenced what facilities participants desired.

### **7.3. Nature of the Experience**

#### **7.3.1. Location**

Campelo, Aitken, Thyne and Gnoth (2014) studied the constructs of 'sense of place' and its importance for destination branding using the case of the Chatham Islands, New Zealand. Sense of place recognises that physical, historical, social and cultural aspects contribute toward the experience of being in a specific location. While this study is not directly concerned with destination branding, the focus groups and market evaluation did highlight the importance of location with regard to scenic airship services. The following constructs were found to make up 'sense of place' for the people of the Chatham Islands: (1) time (i.e. peculiar aspects of the location may create a unique rhythm and pace); (2) ancestry, (i.e. connection with the history of the area creates a peculiar culture and associated values); (3) landscape, (i.e. the relationship between the physical environment and the residents of the location); and (4) community, (i.e. cultural and social relations that create a sense of belonging and mutual understanding) (Campelo *et al.*, 2014). While not studied further in this study, it is plausible that some of these aspects may be what drove participants towards a certain location in the focus groups, or what made Queenstown an attractive location to participants in the market evaluation.

The remoteness of the location being visited was also a highly significant mediating factor. The focus group and questionnaire showed that a substantial segment of tourists prefer visiting remote places over non-remote places. It is possible that this relates back to the notion of adventure as discussed under adventure activities in this section, or it could relate to observing nature in that remote areas may have natural features that are difficult to get to and observe. A search of the literature failed to find similar findings with regard to preference for remote locations. One implication of this for future research is that remoteness could be a useful factor to examine when looking at the appeal of nature-based, adventure and scenic tourism.

### **7.3.2. Duration**

Budget and time are acknowledged as the largest constraints when consumers are planning travel arrangements such as accommodation, transportation, dining, recreation and other tourism services (Zhu, Hu, Wang, Xu & Cao, 2010). This has lead Hasuike, Katagiri, Tsubaki and Tsuda (2013) to develop a mathematical algorithm to work out satisfaction values for sightseeing activities as a function of time-dependent variables such as the time and duration of a service. Hasuike *et al.* (2013) also pointed out time and duration of sightseeing services indirectly affect satisfaction by determining aspects, such as whether meals are required or whether accommodation is necessary.

This thesis verified that duration would be an important aspect for consumers with regards to a scenic airship service. The focus groups and questionnaire showed a wide variation of preferences with regard to duration. The market evaluation also showed that duration was a major determinant of fair price and whether participants would purchase a flight on the scenic airship service or not.

### **7.3.3. Relaxing vs. Adventurous Experience**

During the focus groups, there was disagreement as to whether the scenic airship service should provide a relaxing or an adventurous experience. The questionnaire also showed large variation and a statistically significant tendency

towards neutrality. While this finding indicates that a scenic airship service should not differentiate itself into either one of these categories, it may be possible to simulate relaxing and adventurous experiences in different parts of the airship. Accordingly, a general discussion of relaxation, adventure and their relationship to tourism is warranted.

Relaxation is sometimes associated with wellness tourism, whereby it is part of escaping from oneself and the world in order to achieve some form of healthy balance or subjective perception of health (Smith & Kelly, 2006). Chen and Petrick (2016) studied the relationship between travel benefits and constraints for consumers and the importance they place on travel. Relaxation benefits were the most influential category of travel benefits, which accordingly influenced the importance of travelling for consumers. In rural tourism, relaxation has been found to be one of the most significant motivations for travel (Park & Yoon, 2009).

Adventure conflicts with relaxation in that while relaxation involves physical refreshment and rest, adventure involves the physical rush of flow and thrill (Buckley, 2012). Accordingly, if someone is motivated by relaxation, they will not be motivated by adventure and *vice versa*. This study therefore shows that in order to capture tourists with different motivations, it is important to offer both relaxation and adventure as part of the scenic airship service.

#### **7.3.4. Nature and Ecotourism**

This study has shown that an important part of a scenic airship service would be the experiences associated with observing nature. Statistically speaking, this was the most significant finding and had an immense effect size. Nature was also a major talking point in the focus groups. These findings prove the hypothesis of the literature review that scenic airship services would need to focus on natural settings and specific elements of the environment. Another major finding of this research was the importance of keeping the airship service environmentally

friendly. This fits in with the idea of ecotourism and supports the notion that most consumers want to minimise the environmental impact of their experience.

One of the key issues with nature-based tourism is whether it is sustainable or not for tourists to visit without degrading the environment (Orams, 1996). This has been a key problem in the Queenstown area, with several proposals for train services to Milford Sound having been denied by the Minister for the Environment because the proposals “do not stack up environmentally” (Baker, 2015). Airships provide a platform that is environmentally friendly (Gadola, 2013; Pant, 2010; Recoskie *et al.*, 2013) and can provide a better platform for viewing nature than alternatives due to being able to fly and have the cabin designed in almost any way.

There is, however, a question of whether social desirability biased the result that participants prefer environmentally friendly services. For example, in the focus groups, participants may have agreed to or elaborated upon another person’s suggestion that the service should be environmentally friendly. In the questionnaire, participants may not have wanted to show that they did not care about the environment to the researcher. This bias is raised because, while 28.6% of the focus group participants and 88.7% of the questionnaire participants wanted an environmentally friendly service, only four participants in the market evaluation used the fact the service was environmentally friendly as part of their reason for purchase.

There are two types of socially desirable responding: (1) self-deception, where the participant actually believes his or her self-reports; and (2) impression management, where the participant deliberately “fakes bad” to obtain sympathy or other responses or “fakes good” in order to make a good impression (Paulhus, 1984; Richman, Kiesler, Weisband & Drasgow, 1999). Several studies have shown the effect social desirability bias in a number of fields, such as the self-reporting of: physical activity (Adams *et al.*, 2005), ethical conduct in business (Chung & Monroe, 2003), violent tendencies (Saunders, 1991) and voter turnout (Holbrook & Krosnick, 2010). Given these human tendencies and the drastic

change in results between the three stages of this research, it seems reasonable to propose that the data represented in this thesis with regard to wanting an environmentally friendly service may be biased due to social desirability.

The finding that observing nature is an important part of scenic airship services, however, is likely not one that would be impacted by social desirability. This is given credence by the fact that scenery and views was the third most important determinant for intention to buy in the market evaluation: roughly one fifth of those who would purchase either option gave scenery or views as a reason.

The primary environmental impacts of conventional aviation services are noise and air pollution (Schipper, 2004). However, airships have considerably lower emissions in terms of greenhouse gases and noise than fixed-wing or rotary-wing aircraft (Gadola, 2013; Pant, 2010; Recoskie *et al.*, 2013). Airships also need little more than a paddock to land in, presenting a situation where major infrastructure development has no bearing on environmental impact (unlike aircraft that require runways and helicopters that require helipads). One environmental impact that is unique to airships, however, is their immense size and the corresponding potential to degrade views for bystanders on the ground. One participant in the market evaluation highlighted this as a concern, calling airships “a potential eyesore”.

### **7.3.5. Uniqueness, Novelty and the Airship Experience**

In this study, uniqueness/novelty and airship experience have been separated because seeing the airship experience as unique is not necessarily the same as seeing the experience as desirable. They are similar, however, in that both findings suggest that airships would form a unique segment of their own. The key difference in essence comes back to Gnoth’s (1997) separation of motives and motivations. Wanting to fly on an airship for the sake of it is a motive because it is generic and while implying a direction, does not necessarily suggest in which context. Wanting to fly on an airship due to their relative uniqueness and novelty is a motivation because it relies upon the individual’s subjective

situation in that they value novelty and think that flying on an airship would be a unique experience. For the purposes of coming to a greater implication, airship experience and uniqueness can both be considered to contribute towards the novelty factor of an airship.

The novelty of airships was highlighted in the focus groups and in the questionnaire. There was a very large effect size observed with regard to the results of the questionnaire. These findings indicate that participants do see airships as unique from other experiences. Novelty consists of four key scale items with regard to a memorable experience: (1) once-in-a-lifetime experience; (2) unique; (3) different from other experiences; and (4) get to experience something new (Kim *et al.*, 2012). All four of these statements were given as reasons in the market evaluation. In fact, airship experience was the most important reason for wanting to purchase either option (1<sup>st</sup>= Option 1, 1<sup>st</sup> Option 2) and uniqueness/novelty was also one of the most important reasons (1<sup>st</sup>= Option 1, 4<sup>th</sup> Option 2). Accordingly, the novelty factor of flying on an airship is actually the most important determinant of purchase intentions.

Novelty seeking behaviour is a well-documented human behaviour. Hirschman (1980) showed that there was a link between novelty seeking and purchasing innovative products. Berlyne (1970) showed that novelty increased the pleasantness and interestingness of coloured shapes during an experiment using verbally expressed preference. Novelty seeking has also been used as a construct within tourism. Lee and Crompton (1992) defined six dimensions of novelty for a tourist: (1) change from routine, (2) escape, (3) thrill, (4) adventure, (5) surprise and (6) boredom alleviation. Using such dimensions, it is possible to see significant overlap with other areas of this study (e.g. adventure activities). Novelty seeking has been shown to be a significant antecedent of mid-term and long-term re-visit intentions with regard to tourist destinations (Jang & Feng, 2007). One difficulty with novelty seeking, however, is that different segments of people appear to seek novelty in different ways (Chang, Wall & Chu, 2006; Snepenger, 1987). This makes it difficult in practical terms to make a tourist experience novel in such a way that its novelty will appeal to most tourists. In

this sense, novelty-seeking behaviour depends upon the subjective situation of the tourist.

### **7.3.6. Quality - Luxury, Comfort, High-end Nature, Quality Experience and Service Quality**

Comfort, luxury, high-end nature, quality experience and service quality were shown in this study to be major determinants of fair price and whether participants would purchase a flight on a scenic airship service. This finding is similar to the finding of Hasuike *et al.* (2013) that comfort was associated with intention to repurchase flights from the same airline. Leg room, cleanliness of the interior, nice crew and good seats are associated with comfort for airline passengers (Vink, Bazley, Kamp & Blok, 2012). Luxury products and services are being bought by middle-income earners on larger scales than previously seen (Silverstein & Fiske, 2003). One reason why people purchase luxury branded goods and services is to signal social status. This is represented by two types of consumers who purchase luxury goods and services: (1) those who purchase conspicuously branded luxury goods and services to signal to the less affluent that they are not one of them; and (2) those who purchase inconspicuously branded goods and services for the sake of perceived quality or other aspects rather than to indicate social status (Han, Nunes & Drèze, 2010). It is not clear from this research which of these reasons was the basis for assigning the label high-end.

Quality experience and service quality can be differentiated based on their relative subjectivity and holism. Quality experiences are determined holistically and the focus is on the self (internal), making these subjective and difficult to measure (Otto & Ritchie, 1996). Service quality, on the other hand, is more objective because it is measure based on attributes and the focus is on the service environment (external) (Otto & Ritchie, 1996). Chen and Chen (2010) also note that the nature of benefit for experience quality is experiential, hedonic and symbolic rather than functional and utilitarian as with service quality. Comfort, luxury, high-end nature quality experience and service quality are all

somewhat subjective and without further study it is difficult to draw further implications other than that some consumers see an airship service as being able to meet their subjective needs with regards to these aspects.

### **7.3.7. Enjoyment - Interesting, Cool and Fun**

Interesting, cool and fun were three adjectives used to describe participant's reasons for wanting to purchase a flight on either option during the market evaluation. The three have been grouped together for discussion because they imply some form of intrinsic enjoyment from flying on an airship service. Interest is an emotion that's function is to motivate learning and exploration (Silvia, 2008). In this sense, participants who wrote interesting as a reason would satisfy their curiosity and eagerness to learn and explore by going on the airship service, which in turn would be enjoyable for them. Cool can be defined as "that elusive, exclusive quality that makes behaviours and objects so hip, desirable and symbolic of being in the know" (Bird & Tapp, 2008, p. 20). Participants who wrote cool as a reason would enjoy the airship service because it is perceived as being an activity that involves being "in the know". Fun can be categorised as a dimension of the hedonism because it involves the pursuit of pleasure (Holbrook & Hirschman, 1982). Hedonism is also a factor used in the scale of memorable experience (Kim *et al.*, 2012). Participants who wrote fun as a reason would therefore derive enjoyment from the perceived experience. As all three items were major factors contributing to participants' purchase intentions, the overall idea of enjoyment regardless of where it is derived from is an important determinant of demand for scenic airship services.

Lack of interest was also shown in the market evaluation to have the opposite effect. Lack of interest was the 2<sup>nd</sup> most important reason for not wanting to purchase Option 1 and the 3<sup>rd</sup> most important for Option 2. The implication of this is that some consumers are simply not interested in the product that is on offer and that this lack of interest affects their purchasing decisions.

## **7.4. Concerns**

### **7.4.1. Safety and Disclosure**

Safety was undeniably the largest concern identified by participants in this study. The majority of focus group participants and the majority of questionnaire participants identified safety as a concern. The moderating factor in both cases was approval from a government authority, such as CAANZ. In the questionnaire, despite 80.3% of participants being concerned by safety, only 4.3% of participants would still be concerned about safety provided that the operation had been approved by CAANZ. This finding was replicated in the market evaluation, where only 1.1% of participants raised the issue of safety, presumably because participants were told at the beginning that the service had received approval from CAANZ. It is also interesting to note the irrationality of this finding given that every commercial aviation operation would have to be approved by CAANZ anyway. This presents implications for other sectors of tourism, such as adventure aviation and calls for future research into the mediating effects of government approval for activities that are perceived to be risky.

Customer perception of safety has been shown in the airline industry to be a significant driver of customer satisfaction, with a larger effect on leisure travellers than on business travellers (Ringle, Sarstedt & Zimmermann, 2011). This is important with regards for a scenic airship service, where all passengers will be on-board for leisure purposes. Negative perceptions of an airline's safety have been shown by numerous studies to be correlated with a lack of customer goodwill (measured by customer accounts or market share), especially following an accident involving that airline (Keiningham, Morgeson, Aksoy & Williams, 2014; Liu & Zeng, 2007; Mitchell & Maloney, 1989). Airships have not been widely used for passenger services since the Hindenburg Disaster of 1937 due to the negative safety perceptions and wide coverage of this event (Archbold, 1994; Hillsdon, 2012). Despite the negative safety perceptions, the actual safety levels of airships show them to be exceptionally safe, with their safety being noted in both military (Van Eaton, 1991) and civilian contexts (Hillsdon, 2012; Pant,

2010; Windischbauer & Richardson, 2005). There are two reasons why the Hindenburg Disaster cannot possibly reoccur: (1) because the exterior materials used to produce airships can no longer be ignited by electrostatic discharge; and (2) because modern airships used the inert and non-flammable helium gas instead of hydrogen (Bain & van Vorst, 1999; Rigas & Sklavounos, 2005). The implication of this is that the general populace would need to be educated about airship safety to quell any negative perceptions that exist about their safety record.

Related to safety was the finding that consumers would want full disclosure of risks and contingencies involved with flying on a scenic airship service. This was suggested as a potential expectation in the focus groups and shown to hold true on the questionnaire. First aid training was also mooted in the focus groups. The concern was that if a passenger had a heart attack or other medical event then they could be seen to in the first instance by a staff member on-board the aircraft. The questionnaire confirmed that first aid training for staff was an expectation for most consumers.

#### **7.4.2. Security**

Security in tourism encompasses many issues. While security is usually oriented towards preventing common terrorist activities, health (biosecurity), social (taxpayer expenditure) and environmental (ecoterrorism) issues are also becoming part of security in tourism (Hall, Timothy & Duval, 2004). Security was raised as a concern in the focus groups and in the questionnaire roughly 40% of participants were concerned about passenger security checks. Several studies have shown a link between travel intentions and security concerns. For example, Kozak, Crotts and Law (2007) showed that international travellers are sensitive towards the occurrence of any type of risk in their desired locations, although there were differences between participants of different national cultures in the perception of risk. Successful terrorist attacks have been shown to affect perceived risk, reducing intentions to engage in leisure travel, although mediated by perceived safety concerns, social risk, travel experience and income (Floyd,

Gibson, Pennington-Gray & Thapa, 2004). Qi, Gibson and Zhang (2009) examined the perceptions of risk and related them to travel intentions for mega-events using the case study of the Beijing Olympic Games in China. They found four perceived risk factors that negatively influenced travel intentions: (1) personal safety; (2) cultural risk (i.e. cultural differences, misunderstandings and political issues); (3) socio-psychological risk (i.e. disapproval, disappointment); and (4) violence risk (i.e. terrorist threats, belligerence). Of the four factors, violence risk was shown to have the greatest negative impact on intentions to travel.

It was interesting to note that during the market evaluation, no one raised the issue of security. Participants in this phase were told that all passengers and their baggage would be screened for security reasons. This suggests that such measures were adequate enough to satisfy those participants who had security concerns. Such security measures, however, do come at great financial cost due to the extremely low risk of a terrorist event actually occurring. For example, in the United States, the Federal Air Marshall Service costs approximately US\$180 million for every life saved, at the other extreme, hardening cockpits doors comes at the cost of \$80,000 per life saved (Stewart & Mueller, 2008). It costs so much per life saved because the measures are actually less effective than what many believe to be true (Stewart & Mueller, 2008). This is what is often coined security theatre: most security programmes are there to give the façade of improving safety, when in reality their effectiveness is not substantial and their primary purpose is to give the flying public the perception of security (Sweet, 2008). The key implication is that only their risk perception needs to be lowered, not the actual risk level. Accordingly, any security measures for a scenic airship service would be implemented with a focus on reducing risk perception rather than actual security risks.

#### **7.4.3. Environmental Impact**

Environmental impact was a concern for significant minorities in both the focus groups and the questionnaire. In the market evaluation, however, environmental impact was a concern for only one participant. The conflict in findings is likely

due to the active promotion of the airship's environmentally friendly nature on the market evaluation information sheet. This means that if consumers were informed, it would be expected that the number concerned with environmental impact might significantly reduce. Even though the environmental impact of airships is relatively low, significant minorities are still concerned about their environmental impact. The implication of this finding is that the environmentally friendly qualities of airships must be emphasised to overcome this mediating factor.

#### **7.4.4. Price Perception**

Price was a concern for participants in the focus groups, the questionnaire and the market evaluation. During the market evaluation, financial status was the most important reason for participants to not purchase either option. Cost was the third most important reason for Option 1 and the second most important for Option 2. In this sense, a participant either perceived the price to be too high due to their own financial situation, or because they thought it was too expensive in a more generic sense. These findings emphasise the subjectivity of price perception. It is largely accepted in the literature that a consumer's perception of attractiveness to a price depends upon a comparison with a reference price (Alford & Biswas, 2002; Han & Ryu, 2009; Janiszewski & Lichtenstein, 1999). Positive price perceptions are positively and significantly associated with purchase intentions and *vice versa* (Munnukka, 2008). The implication of this is that price perception will inevitably influence the willingness of consumers to pay for scenic airship services. Financial status and cost do not indicate a lack of interest, but rather an inability or unwillingness to pay. Essentially, the price for any product must be balanced with demand and a certain amount of demand will always fall short of the market price.

The perception of fair price in the market evaluation was highly influenced by comparisons with what participants saw as related products. The most important comparisons were made with small aircraft and helicopter flights, tourist activities, airline flights and cruises. While these influenced price

perceptions of fair price, they were not major determinants of intention to purchase. Accordingly, this thesis showed that related products are used for making price assumptions in the absence of other information.

#### **7.4.5. Opportunity Cost**

Opportunity cost was identified during the focus groups as a potential concern, in that some participants felt that they would be better off spending either their time or their money on a different experience. To avoid confusion with lack of interest, in the questionnaire participants were presented with a trade-off of whether they would prefer to use other transport for a similar scenic experience. The questionnaire showed that nearly all participants disagreed with this notion. However, 16% of participants in the questionnaire would prefer to obtain a similar experience in different ways. Opportunity cost was identified as the fourth most important reason for not wanting to purchase both Option 1 and Option 2 during the market evaluation. Opportunity cost can be viewed in a number of ways. Smith, Desvousges and McGivney (1983) observed that both travel time and on-site time were important factors in recreation demand models. However, Frederick, Novemsky, Wang, Dhar and Nowlis (2009) found that consumers tend to neglect opportunity cost when making purchasing decisions and do not actively generate alternatives that each purchase option would displace. The conflict in participants' opinions observed in this study and in the literature suggests that opportunity cost is a mediating factor for some consumers, while irrelevant for other consumers.

One aspect that was identified in the focus groups as potentially influencing whether an airship service was the most desirable option, was whether kids and families would be on-board. Some participants suggested that they might be put off if they had to listen to the screaming of children on-board. The questionnaire, however, found that only 7.3% of participants were concerned by this notion. Accordingly, the presence of children and families would unlikely have much influence over opportunity cost.

#### **7.4.6. Disappointment**

During the focus group discussions, disappointment as a concern was shown towards having a flight cancelled due to bad weather. Those who were concerned highlighted the psychological impact of being excited for the flight and then having it cancelled. This effect was tested in the questionnaire and it was shown that overall participants agreed with this notion. Disappointment aversion has been linked to risk aversion in uncertain contexts, where consumers will pay a premium to avoid disappointment (Bell, 1985; Gul, 1991). In this sense, the higher the risk of being disappointed due to cancellation, the higher the aversion towards that activity will be and the lower the consumer will pay to undertake the activity. In retrospect the emotion of disappointment can be linked to regret and both disappointment and regret effect future purchasing behaviour for the same product (Zeelenberg, Van Dijk, Manstead & vanr de Pligt, 2000). The implication is that consumers are concerned about being disappointed and if the risk of disappointment is perceived to be too high, then they will expect a discount (disappointment premium) or else will be averse to undertaking such an activity.

## **7.5. Practical Contribution**

This study showed that a number of factors influence the pricing and demand of scenic airship services. These are all discussed within the Discussion section. Here, both research questions are answered and a model (see Figure 18) is presented that visually depicts the practical contribution of this research. Consumer interest and pricing and demand are treated as synonymous in that the price participants give implies the perceived financial value of a flight on the scenic airship service and intention to purchase shows interest in parting with money in order to purchase a flight on such a service.

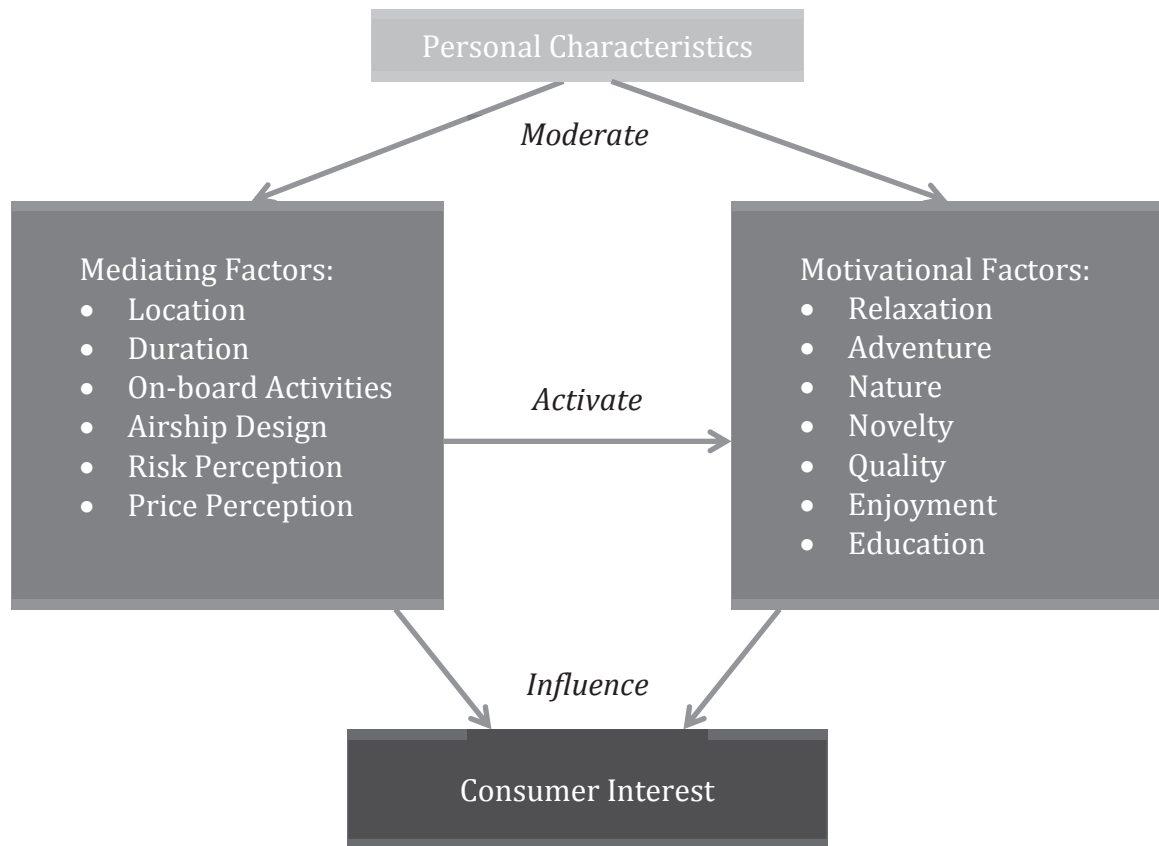
### **7.5.1. Research Question One: Is there consumer interest in scenic airship services?**

The short answer is yes. The market evaluation showed that 71.7% of participants would pay their given price for Option 1 and 43.9% would pay their given price for Option 2. Furthermore, a large number of the participants that would not pay their given price for either option were still interested but were unwilling to pay for the scenic airship service due to some form of mediating factor (e.g. financial status). In total, only 6.4% of participants for Option 1 and 9.1% of participants for Option 2 were genuinely not interested in purchasing a flight on the scenic airship service. These findings indicate that there is substantial interest from consumers in scenic airship services.

### **7.5.2. Research Question Two: What consumer preferences influence interest in such services?**

The model presented in this research separates consumer preferences into motivational factors (i.e. those factors that motivate consumers' interest in scenic airship services) and mediating factors (i.e. those factors that determine how much effect each motivational factor has upon consumer interest). The model is presented in Figure 18.

**Figure 18. Descriptive Model for Deriving Consumer Interest in Scenic Airship Services**



**7.5.2.1. Personal Characteristics:**

These are defined by the objective (e.g. age, gender, financial status) and subjective (e.g. values, beliefs and expectations) situation of the consumer in question.

**7.5.2.2. Motivational Factors:**

*Relaxation:* The perceived relaxation that would be experienced on-board.

*Adventure:* The thrill associated with undertaking adventure activities and visiting remote areas

*Nature:* The value derived from observing nature and helping to minimise the environmental impact of the sightseeing activity

*Novelty:* The value derived from the sense of uniqueness of flying in an airship

<i>Quality:</i>	<i>The value derived from comfort, luxury, the high-end nature, the experience quality and the service quality of the service</i>
<i>Enjoyment:</i>	<i>The value derived from perceiving the scenic airship service as interesting, cool or fun</i>
<i>Education:</i>	<i>The value derived from learning as part of a scenic airship service</i>

#### **7.5.2.3. Mediating Factors:**

<i>Location:</i>	<i>The influence of the geographic location of the scenic airship service</i>
<i>Duration:</i>	<i>The influence of the duration of the scenic airship service</i>
<i>On-board Activities:</i>	<i>The influence of the available activities such as food and drink, adventure activities, educational activities, overnight stays, venue hire and stop offs</i>
<i>Airship Design:</i>	<i>The influence of the airship design in terms of the facilities provided, the aesthetics of the airship and the servicescape that the facilities and aesthetics combine to provide</i>
<i>Risk Perception:</i>	<i>How risk is perceived in terms of safety, security, environmental impact and disappointment, including mitigating factors such as government approval and amount of risk and contingency disclosure</i>
<i>Price Perception:</i>	<i>The influence of how price is perceived according to the subjective and objective situation of the consumer</i>

#### **7.5.2.4. Consumer Interest**

Consumer interest in this case has been defined in terms of pricing and demand.

#### **7.5.2.5. Description**

The key idea of this model is that mediating factors constitute the aspects that are required for the motivational factors to have any effect. For example, the mediating factor may be on-board activities and the motivating factor may be

adventure. Unless adventure activities and visits to remote areas are included (mediating factors) during the flight, then adventure (motivational factor) will not influence consumer interest. In other words, the motivational factors are latent until activated by the mediating factors, upon which they contribute to consumer interest. The mediating factors, however, can directly influence consumer interest without motivational factors. Personal characteristics moderate the influence of both motivational and mediating factors.

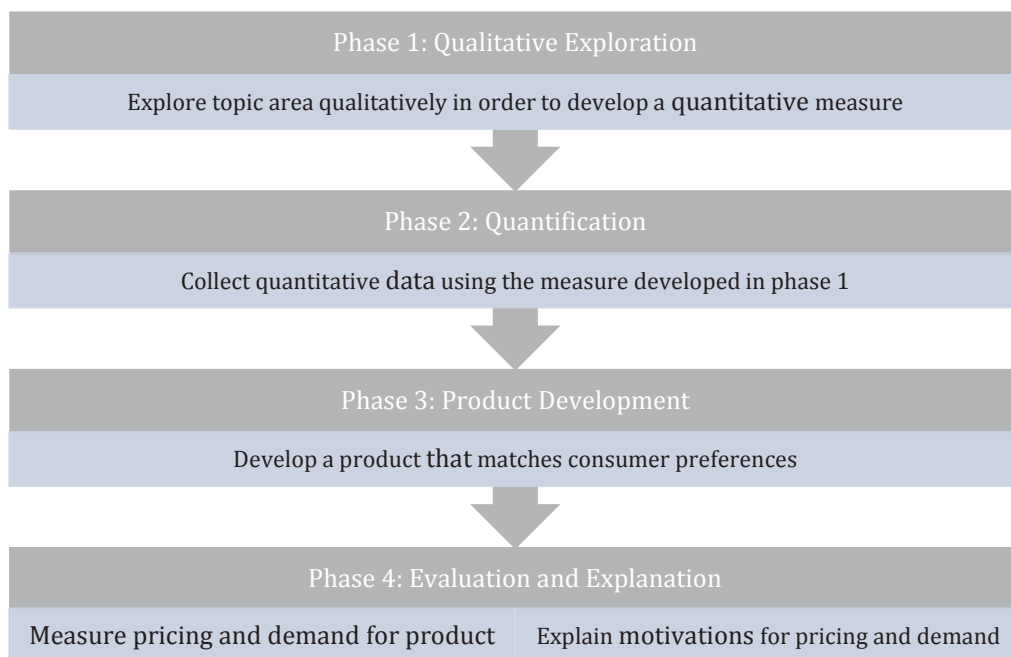
## **7.6. Methodological Contribution**

By creating a new approach for developing and testing a new discontinuous products (e.g. scenic airship services), this study provides a methodological platform for further research into potential tourism products and services that do not currently exist. The approach taken is market-in (see the NPD section under Methodology), in that market preferences determine the design of the product offering. As outlined in the Methodology section, by starting with no assumptions about consumer preferences and allowing consumers to present ideas about a new concept in an open qualitative setting, a more objective picture of consumer preferences can be garnered. This is because the qualitative phase (Phase 1 in this thesis) explores the concept's topic area (e.g. airships for sightseeing) without probing specific ideas as would usually happen in a questionnaire (e.g. how important is leg room?). This exploration will allow a quantitative measure to be developed that can be used to quantify the opinions represented in the qualitative phase. These two phases ensure that: (1) no findings occur solely because the researcher probed an area that otherwise would not have been raised by participants; and (2) the questions asked in the quantitative phase represent a relatively exhaustive range of possibilities for the product. In this research, point (2) was exemplified in that every opinion raised during the focus groups received at least some support in the questionnaire and very few additional comments were raised.

After the first two phases comes the product development phase, where a specific product offering is designed in accordance with consumer preferences. Once a definite product has been developed, it can be tested using a market evaluation as in this study. There may be multiple ways of exploring topic areas), quantifying opinions and evaluating products in market settings. Accordingly, it is up to the individual researcher to decide which exact methods to use, however the following guidelines can be used: (1) the exploration phase should use a purely qualitative methodology (e.g. focus groups, semi-structured interviews); (2) the quantification phase should use a quantitative measure that accurately represents the opinions of the exploration phase, while still allowing participants

to add opinions qualitatively if desired; (3) product development should be based upon the results of the first two stages; (4) market evaluation(s) must occur in a plausible market setting; (5) pricing and demand should be measured quantitatively; and (6) the reasons behind consumer's pricing and demand should be assessed qualitatively. Figure 19 illustrates the proposed methodology for developing and testing new discontinuous products.

**Figure 19. Proposed Methodology for Developing and Testing New Discontinuous Products**



The proposed methodology differs from existing NPD processes for tourist products in that it does not assume that data already exists to create new products (Liao *et al.*, 2010), or that motives alone provide a suitable basis for new product development (Cleaver *et al.*, 1999). It also differs from existing NPD literature on the development of discontinuous products in that the process does not assume that a meaningful product can be subjectively produced and then improved after introduction to the market (Lynn *et al.*, 1996; Veryzer, 1998). While removing these assumptions may mean that the NPD process takes longer, once the product is developed, fewer improvements should have to be made because the product should align with market preferences. This was exemplified in this study because both the products developed from the exploration and

quantification stages (Option 1 and Option 2) received interest from over 90% of participants during the market evaluation. Not only does this make this methodology more objective from an academic standpoint, but from a practical standpoint it could be used by tourism entities and other organisations in order to develop new offerings and products that match market preferences upon introduction to the target market, rather than introducing an immature product and refining it after introduction.

## **8.0 Conclusion**

This study proposed the concept of using airships as a platform for scenic flights in the tourism industry. Two key areas were researched: (1) consumer interest in scenic airship services and (2) consumer preferences that influence consumer interest in such a service. Both research areas were assessed using the case study of the tourism market of Queenstown, New Zealand. A new mixed-methods approach was developed and employed in this research to study this concept.

The findings of this thesis show overwhelming interest from consumers with regard to the idea of a scenic airship service. A descriptive model was developed on the basis of the results with regard to consumer preferences. Preferences were categorised into one of two types of factors: (1) motivational factors (relaxation, adventure, nature, novelty, quality, enjoyment and education) and (2) mediating factors (location, duration, on-board activities, airship design, risk perception and price perception).

There are two major contributions of this research. The practical contribution is that scenic airship services are a potentially viable market that is currently not being exploited. The methodological contribution is a new methodology for developing and testing new discontinuous products.

## **8.1. Limitations and Possibilities for Future Research**

Due to the case study nature of this research, the general principles outlined in this research may not be generalisable to other locations. Additionally, due to the use of English for the administration of all phases of this research, it is possible that miscommunications occurred and that non-Anglophones were underrepresented in this study. This would once again question the generalisability of the research. A validation of the findings of this research in another market and perhaps in a different language, would help substantiate the generalisability of this study's findings. However, each phase of the research was piloted with speakers of English as a second language in order to ensure ease of completion and accordingly mitigate the effect of this limitation.

This study showed that there might also be consumer interest in other civilian uses for airships. Specifically raised was the idea of using airships as vehicle and passenger ferries across land and sea and the idea of using airships for multi-day cruises. Both of these ideas were raised in the focus groups, but were not studied further due to the scope constraints of this study. Future research should take place to assess consumer interest in other, potentially viable, applications for airship technology.

This study found that the remoteness of scenic attractions was a major factor in determining consumer interest in scenic airship services. It would be of interest to study whether this effect is also present in other sectors of the wider tourism industry. In addition, government approval for risky activities was shown to mitigate risk perception for participants in this study. This has interesting implications for other areas of tourism that may be deemed risky, such as adventure tourism. Research into the mitigating effect of government approval for risky activities should be undertaken to examine the extent to which this effect holds true in other settings.

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# Appendices

## Appendix A – Airship Model Manufacturers

The following is a list of airship manufacturers that were examined to see what airships are available for scenic tourism operators. It is separated into two categories, manufacturers who are in production of the airships and manufacturers with only a prototype or concept in existence.

In production:

- Van Wagner Airship Group (VWAG) (acquirer of American Blimp Corporation and The Lightship Group) (USA)
- Cameron Balloons (incorporating Thunder & Colt) (UK)
- GEFA-FLUG GmbH (Germany)
- Aero-Nautic Services & Engineering (A-NSE) (France)
- Hybrid Air Vehicles Ltd (HAV) (UK)
- Aeroscraft (USA)
- Raven Aerostar (USA)
- Heinzl Balloons (Germany)
- Airship Solutions (Australia)
- Information Systems Laboratories incorporated (USA)
- Mobile Airships incorporated (Canada)
- Nortávia (Portugal)
- Lockheed-Martin (USA)
- Lindstrand Technologies (UK)
- Hangzhou Chiny Aircraft Technology (China)
- Northrop Grumman (LEMV) (USA)
- RosAeroSystems s.r.a. (Russia)
- Skyship Services Inc (Skyship series) (previously Airship Management Services) (USA)
- TCOM LP (USA)
- Shanghai Vantage Airship Manufacture (SVAM) (China)

- Westdeutsche Luftwerbung GmbH (WDL) (Germany)
- Zeppelin Luftschifftechnik GmbH (Germany)
- Anabatic Sàrl (Switzerland)
- CargoLifter (Germany)

Prototype/Research LTA Projects:

- Global Near Space Corp. (USA)
- Lonsan United Aviation Technology (China)
- Ohio Airships, Inc. (USA)
- Airship Manufacturing (USA)
- Skyhook International / Boeing (USA)
- SkyLifter Pty Ltd (UK)
- Varialift Airships (UK)
- Voliris (France)
- Aether Airship Concept (UK)

## Appendix B – Map of Study Location

Figure 20. Detailed Map of Location for Questionnaire and Market Evaluation Administration



## Appendix C – Questions and Formats for Questionnaire

1. What is your gender? (Gender question)
2. What is your age? (Numerical question)
3. What is your country of residence? (Multiple choice/short qualitative)
  - (If New Zealand) Are you a resident of Queenstown?
4. Which of the following best reflects your relationship status? (Multiple choice)
5. Do you have any children? ('Yes' or 'No')
6. Which durations would you consider for a scenic airship service (you may select more than one option)? (Multiple choice)
7. Would you expect food or drink to be served on-board? ('Yes' or 'No')
  - (If yes) Please select which types of food and drink you would like on-board (you may select more than one option): (Multiple choice/short qualitative)
8. Would you want to undertake adventure activities (i.e. bungy jumping or skydiving) while on-board the airship? ('Yes' or 'No')
  - (If yes) Which of the following adventure activities would you want to undertake while on-board a scenic airship service (you may select more than one option)? (Multiple choice/short qualitative)
9. Please rank the following facilities in order of importance: (Ranking)
10. Which of these facilities would you actually want (you may select more than one option)? (Multiple choice)
11. Would you want a section of the airship's floor to be see-through (transparent)? ('Yes' or 'No')
12. Would you want to be provided with viewing devices (i.e. binoculars, telescopes) as part of a scenic airship service? ('Yes' or 'No')
13. Would you like to be able to go outside of the cabin while in flight? ('Yes' or 'No')
14. Would you expect to be able to hire private areas (i.e. rooms for couples or families) as part of a scenic airship service? ('Yes' or 'No')
15. How much do you agree with the following statement: "Modern airship designs look more appealing than traditional airship designs"? (Likert multiple choice)
16. How much do you agree with the following statement: "The airship should be divided into different areas with different activities"? (Likert multiple choice)
17. Should that airship have an area where passengers can go to learn more about the area that they are flying over? ('Yes' or 'No')

- (If yes) Which of the following areas would you want to learn about while on-board a scenic airship service (you may select more than one option): (Multiple choice/short qualitative)
18. Would you want a guide to provide general commentary while on-board a scenic airship service? ('Yes' or 'No')
  19. Would you want interactive information facilities (simulations, computers) on-board a scenic airship service? ('Yes' or 'No')
  20. Would you expect wireless internet (wifi) to be provided on-board a scenic airship service? ('Yes' or 'No')
  21. Would you want to stay overnight as part of a scenic airship service?
    - (If yes) Where would you want to stay overnight (you may select more than one option)? (Multiple choice/short qualitative)
  22. Would you be interested in being able to charter the airship for private functions (i.e. weddings, conferences, etc.)? ('Yes' or 'No')
  23. Would you want to stop off along the way (i.e. land and visit an area)? ('Yes' or 'No')
    - (If yes) What activities would you want to stop off for (you may select more than one option) (Multiple choice/short qualitative)
  24. Would you like live musical performances on-board a scenic airship service? ('Yes' or 'No')
    - (If yes) Which type(s) of musical performance would you want on-board (please separate each suggestion by a comma)? (Short qualitative)
  25. Would you prefer scenic airship services to be relaxing or adventurous? (Slider)
  26. How much do you agree with the following statement: "An important part of scenic airship services would be observing nature"? (Likert multiple choice)
  27. Would you be more likely to purchase a flight on a scenic airship service if the service was environmentally friendly? ('Yes' or 'No')
  28. How much do you agree with the following statement: "I am interested in flying on airships because they are unique"? (Likert multiple choice)
  29. How much do you agree with the following statement: "I would find scenic airship services to remote areas more interesting than services to non-remote areas"? (Likert multiple choice)
  30. Do you think it would be appropriate for families and children to fly on scenic airship services? ('Yes' or 'No')
    - (If no) What if there was an area especially for children to play? ('Yes' or 'No')

31. Do any of these aspects concern you when you think of a scenic airship service (you may select more than one option)? (Multiple choice/short qualitative)
  - (If safety) Would approval from the Civil Aviation Authority make you feel safer about flying on a scenic airship service? ('Yes' or 'No')
32. How much do you agree with the following statement: "I would want full disclosure about risks and contingencies before flying on a scenic airship service"? (Likert multiple choice)
33. How much do you agree with the following statement: "I would not fly on an airship if I could get a similar service using conventional transport (e.g. bus, airplane, boat)"? (Likert multiple choice)
34. Would you expect that all staff operating the scenic airship service would have first aid training? ('Yes' or 'No')
35. Is there anything else that you would like to add? (Long qualitative)

Figure 21. Gender Questions



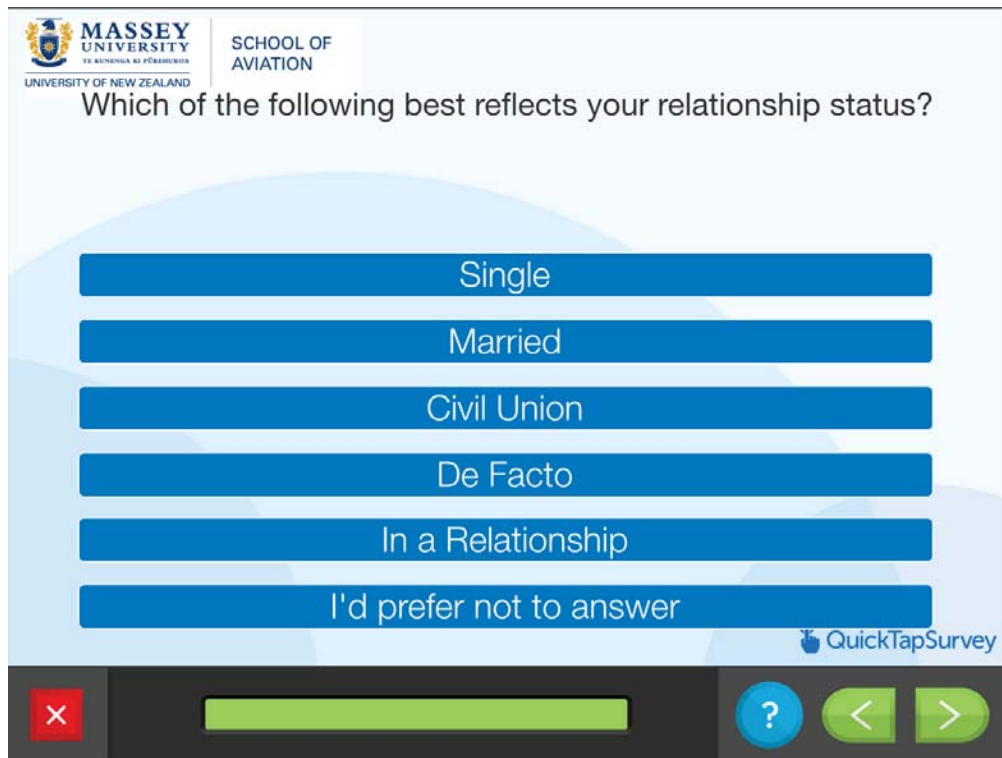
Figure 22. Numerical Questions



Figure 23. 'Yes' or 'No' Questions



Figure 24. Nominal Multiple Choice Questions



**Figure 25. Likert Multiple Choice Questions**

MASSEY UNIVERSITY  
UNIVERSITY OF NEW ZEALAND  
SCHOOL OF AVIATION

How much do you agree with the following statement: "The airship should be divided into different areas with different activities"?

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

QuickTapSurvey

Navigation icons: Close (X), Progress bar, Help (?), Previous (<), Next (>)

**Figure 26. Ranking Questions**

MASSEY UNIVERSITY  
UNIVERSITY OF NEW ZEALAND  
SCHOOL OF AVIATION

Please rank the following facilities in order of importance:

Viewing area/Observation deck

Spacious cabin area

Pool/Spa facilities

Casino

Library/Reading area

Entertainment room (TV, games)

QuickTapSurvey

Navigation icons: Close (X), Progress bar, Help (?), Previous (<), Next (>)

Figure 27. Slider Questions

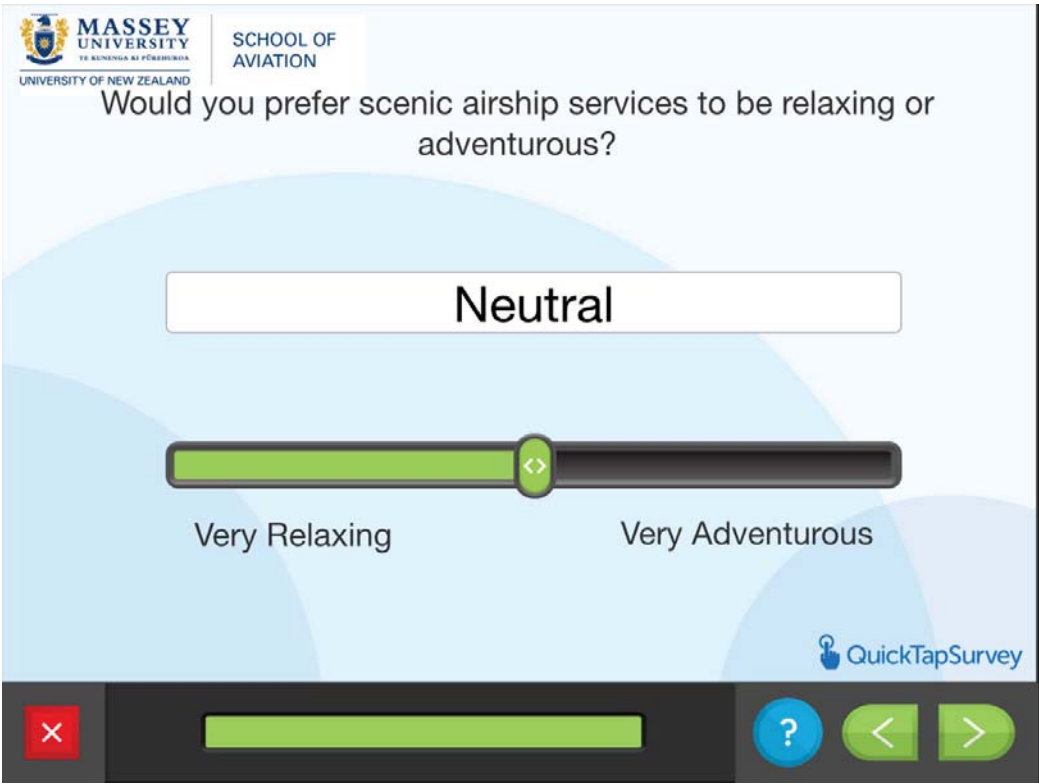


Figure 28. Short Qualitative Questions

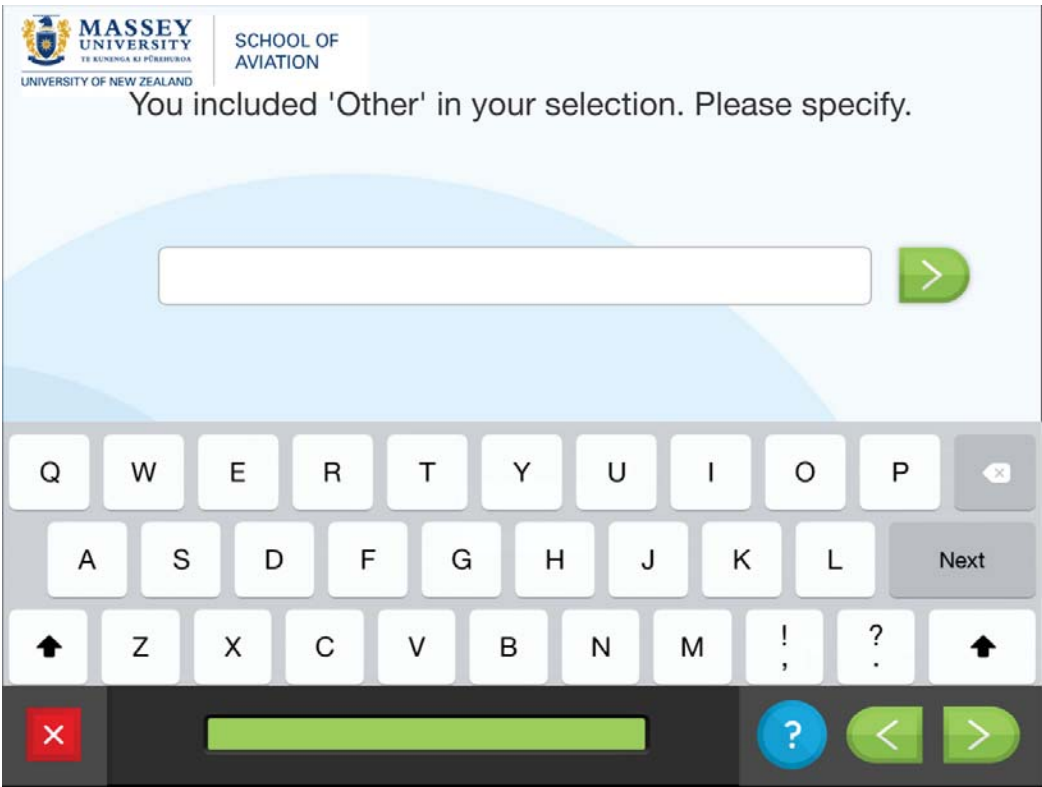
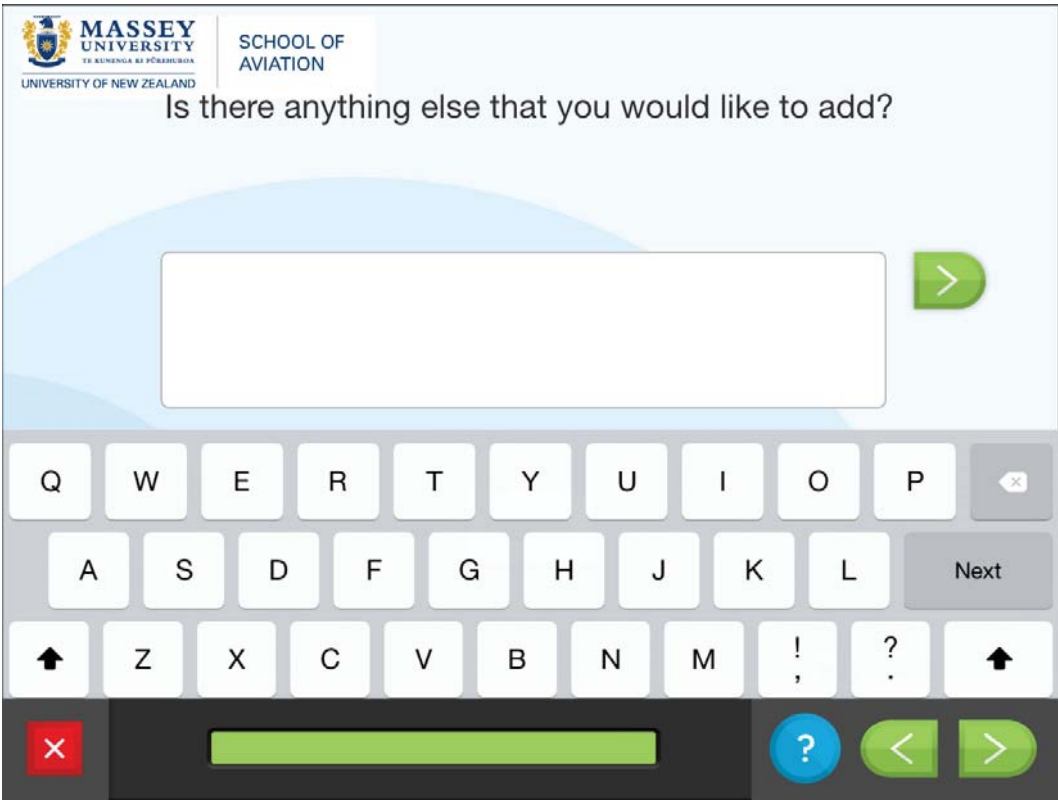


Figure 29. Long Qualitative Questions



## Appendix D – Snapshots of Video Shown to Market Evaluation Participants

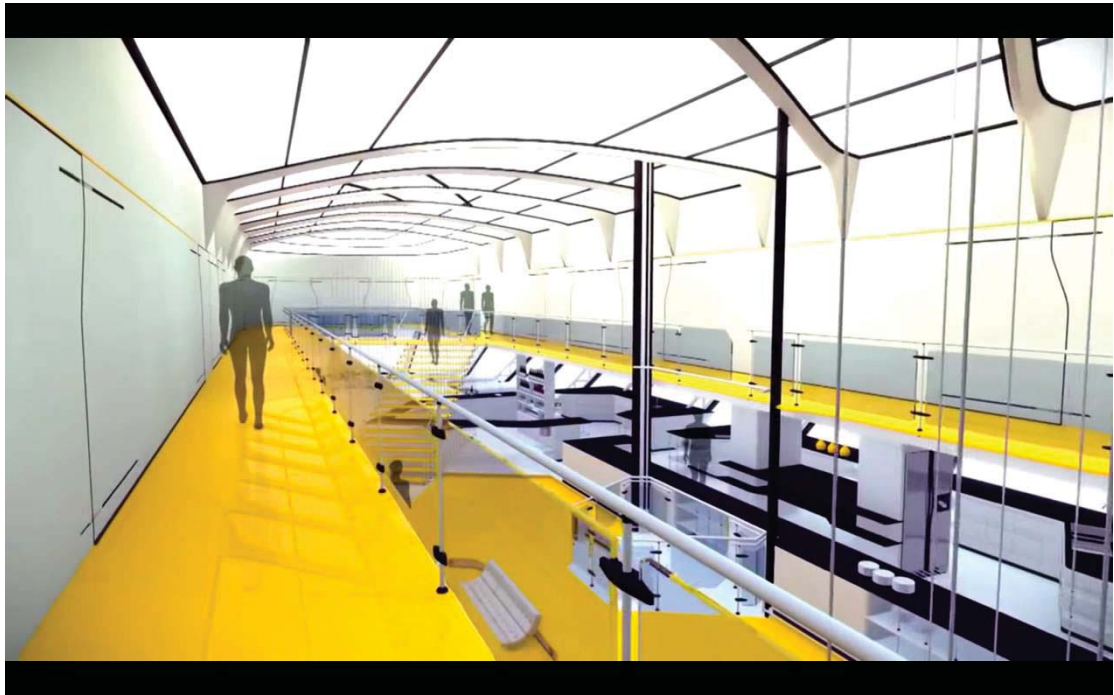
Figure 30. Snapshot of Takeoff



Figure 31. Snapshot of Lobby 1



**Figure 32. Snapshot of Lobby 2**



**Figure 33. Snapshot of Dining Area 1**



**Figure 34. Snapshot of Dining Area 2**



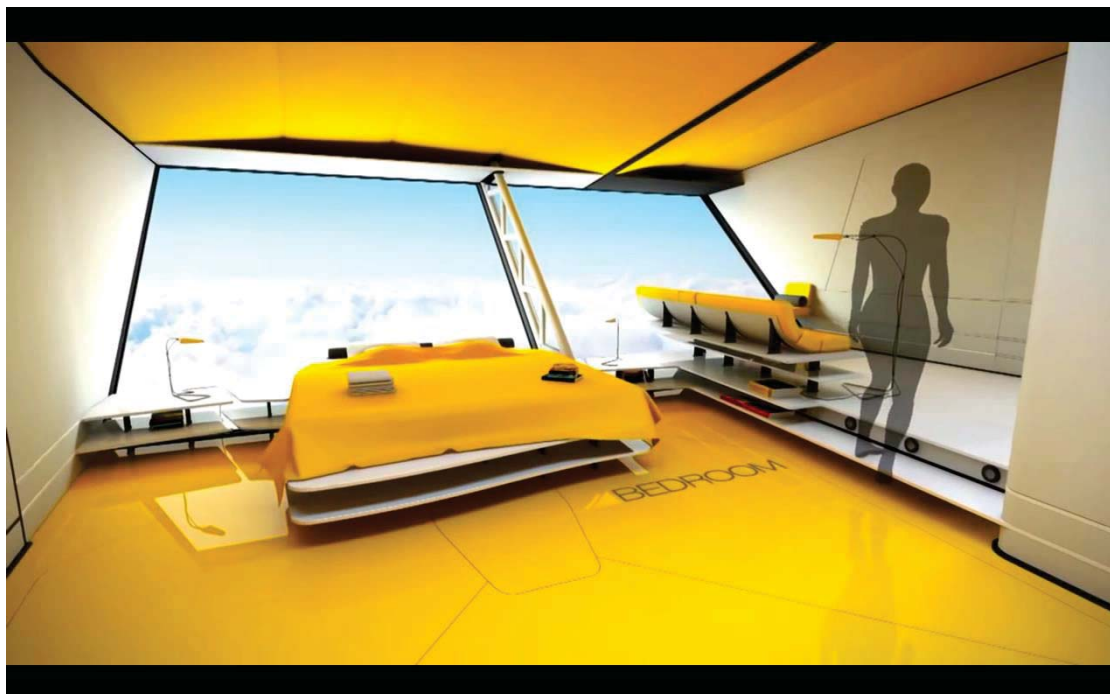
**Figure 35. Snapshot of Bar**



**Figure 36. Snapshot of Kitchen**



**Figure 37. Snapshot of Bedroom 1**



**Figure 38. Snapshot of Bedroom 2**



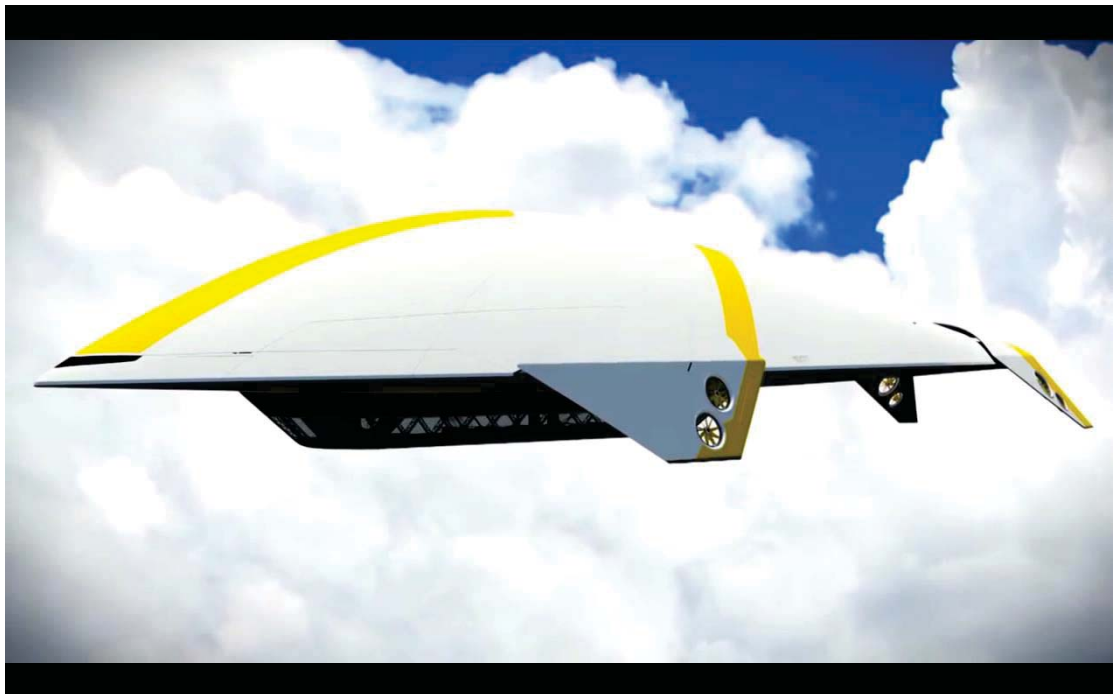
**Figure 39. Snapshot of Bedroom 3**



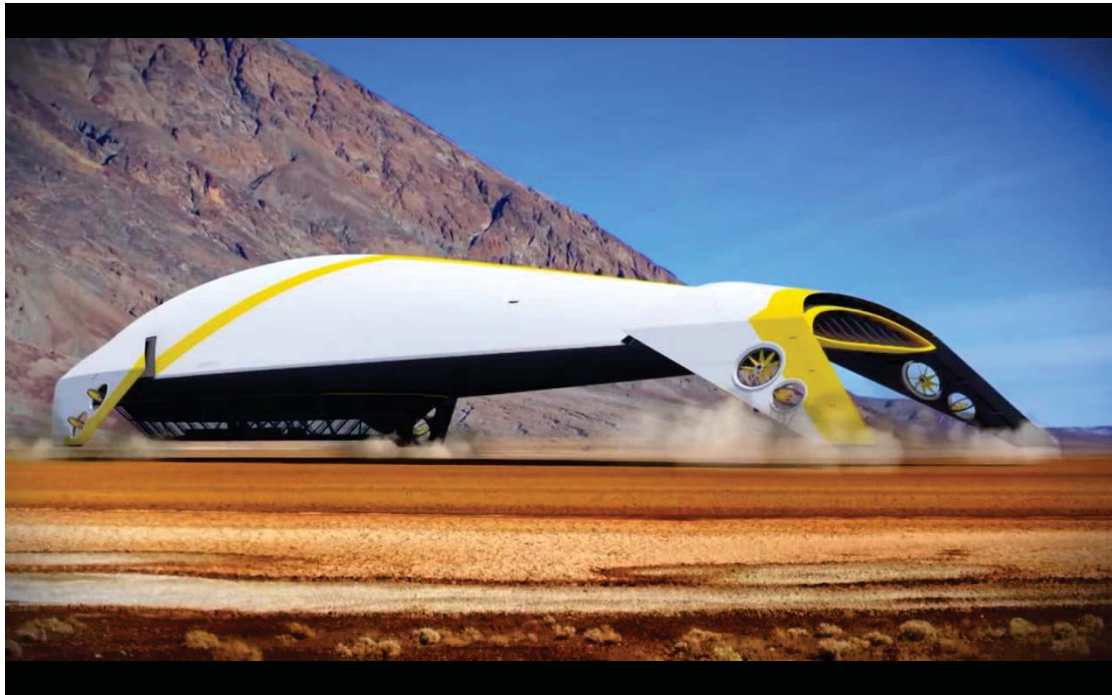
**Figure 40. Snapshot of Bedroom 4**



**Figure 41. Snapshot of Airship In-Flight**



**Figure 42. Snapshot of Landing**



**Note:** All pictures of the Aether Concept Airship were reproduced with the permission of Mac Byers, who is the rightful copyright holder of this design.

## Appendix E – Additional Participant Information

**Table 12. List of Focus Group Participants, Categorised by Gender, Age and Nationality**

	<b>Participant</b>	<b>Gender</b>	<b>Age</b>	<b>Nationality</b>
Focus Group 1 (F1)	A	Male	66	New Zealand
	B	Female	30	Slovakia
	C	Male	27	China
	D	Female	29	United States
	E	Female	21	East Timor
	F	Female	25	Germany
	G	Female	20	New Zealand
	H	Female	29	Malaysia
	I	Male	36	New Zealand
	J	Female	22	China
	K	Female	22	China
Focus Group 2 (F2)	A	Male	19	United Kingdom
	B	Male	27	China
	C	Male	27	Saudi Arabia
	D	Male	26	Singapore
	E	Male	19	New Zealand
	F	Female	48	Sri Lanka
	G	Female	21	New Zealand
	H	Male	36	New Zealand
Focus Group 3 (F3)	A	Female	20	New Zealand
	B	Male	34	New Zealand
	C	Male	21	China
	D	Female	18	New Zealand
	E	Female	29	China
	F	Female	22	New Zealand
	G	Male	37	China
	H	Male	26	New Zealand
	I	Female	18	Taiwan

*Note: Participant K from focus group 1 was present for the focus group, yet did not propose any suggestions, only agreed or disagreed with other participants through the use of expressive cues such as laughter or sounds of approval.*

**Table 13. Questionnaire Participants by Country of Residence**

<b>Country of Residence</b>	<b>Number</b>	<b>Percentage</b>
New Zealand*	81	27%
Australia	66	22%
United Kingdom	23	7.7%
China, People's Republic of	17	5.7%
Germany	17	5.7%
United States of America	12	4%
France	9	3%
India	6	2%
Canada	5	1.7%
Japan	5	1.7%
Singapore	5	1.7%
Austria	4	1.3%
Czech Republic	4	1.3%
Korea, Republic of	4	1.3%
The Netherlands	4	1.3%
Brazil	3	1%
Hong Kong	3	1%
Italy	3	1%
Malaysia	3	1%
Switzerland	3	1%
Taiwan	3	1%
Colombia	2	0.7%
Indonesia	2	0.7%
Ireland	2	0.7%
Thailand	2	0.7%
Argentina	1	0.3%
Belgium	1	0.3%
Chile	1	0.3%
Denmark	1	0.3%
Finland	1	0.3%
Israel	1	0.3%
Norway	1	0.3%
South Africa	1	0.3%
Oman	1	0.3%
Sweden	1	0.3%
Kingdom of Tonga	1	0.3%
Vietnam	1	0.3%

*\* Note that 25 of the participants from New Zealand were local to Queenstown, whereas 56 were visitors to Queenstown.*

**Table 14. Market Evaluation Participants by Country of Residence**

<b>Country of Residence</b>	<b>Number</b>	<b>Percentage</b>
New Zealand*	42	22.5%
United Kingdom	33	17.6%
Australia	20	10.7%
Germany	15	8%
United States of America	15	8%
People's Republic of China	12	6.4%
Japan	10	5.3%
France	4	2.1%
Singapore	4	2.1%
Taiwan	3	1.6%
Czech Republic	2	1.1%
Denmark	2	1.1%
Hong Kong	2	1.1%
Spain	2	1.1%
Sweden	2	1.1%
Switzerland	2	1.1%
The Netherlands	2	1.1%
Argentina	1	0.5%
Belgium	1	0.5%
Canada	1	0.5%
India	1	0.5%
Indonesia	1	0.5%
Israel	1	0.5%
Italy	1	0.5%
South Korea	1	0.5%
Mexico	1	0.5%
Nepal	1	0.5%
Norway	1	0.5%
Philippines	1	0.5%
Romania	1	0.5%
South Africa	1	0.5%
Vietnam	1	0.5%

*\* Note that 8 of the participants from New Zealand were local to Queenstown, whereas 34 were visitors to Queenstown.*

## Appendix F – Airship Information Booklet



Slow-moving  
aircraft

Environmentally  
friendly

No airport  
required



They can take many different appearances



The cabin  
can be  
designed in  
almost any  
way



3

Choose what facilities you would like onboard...



4

## Appendix G – Questionnaire Information Sheet



### Airship Study: Information Sheet

This study is looking at whether consumers would be interested in airships being used for scenic passenger flights. You must be aged 18 or over to take part in this study. Every participant will receive one entry into the prize draw for a \$500 travel voucher.

If you would like to take part in this survey, use the following instructions:

1. Look through the small booklet on airships. You may refer to this throughout the study.
2. Imagine that airships were used for scenic flights in this area. What would you want this service to look like?
3. Complete the questionnaire on the iPad.

Please note that you may choose to discontinue the study at any stage. If you have any difficulties, please speak to the researcher.

"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. Isaac Henderson is responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Dr Brian Finch, Director (Research Ethics), telephone 06 356 9099, extn 86015, e-mail [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)'

## Appendix H – Market Evaluation Information Booklet



### Airship Study: Information Sheet

This study looks at whether consumers would be interested in airships being used for scenic passenger flights. You must be aged 18 or over to take part in this study. Every participant will receive one entry into the prize draw for a \$500 travel voucher.

If you would like to take part in this survey, please read the following instructions:

1. Imagine that you have the opportunity to purchase a flight on a scenic airship service to look around Queenstown and the surrounding areas.
2. Start the questionnaire on the iPad. You will be shown a video of the product.
3. Refer to the information booklet when required.

Please note that you may choose to discontinue the study at any stage. If you have any difficulties, please speak to the researcher.

This project has been peer reviewed and deemed to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. Isaac Henderson is responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Dr Brian Finch, Director (Research Ethics), telephone 06 356 9099, extn 86015, e-mail [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)

## Key Information about this Scenic Airship Service

- The airships are very safe and use modern technology
- The operation has been approved by the Civil Aviation Authority
- Passengers and their baggage will be screened by security
- Airships are an environmentally friendly mode of transport

## All services include:

- ✓ Wireless internet
- ✓ Transparent floor section
- ✓ Viewing devices (binoculars and telescopes)
- ✓ Optional educational activities (General commentary, guides, computers)
- ✓ Ability to go outside airship

## Differences between options:

	<b>Option 1: Sightseeing Tour</b>	<b>Option 2: Overnight Stay</b>
Duration	3 ½ hours	Overnight (2pm – 10am)
Meals	One complimentary meal	All meals complimentary
Drinks	One complimentary drink	All drinks complimentary
Accommodation	No	Yes
Toilet and Bathroom Facilities	Public toilet	Public toilet & private bathrooms in room
Private Area	For hire	Included

## Appendix I – Fair Price Determinants

Table 15. Determinants of Fair Price for Option 1 with Explanations, Number of Participants, Percentage of Participants and

### Rank

Determinant	Explanation	No.	%	Rank
Helicopter/Small Flights	Aircraft Fair price was determined to some extent by comparing with prices for flights on helicopters or small aircraft	40	21.4	1
Duration	Duration was used to determine a fair price	30	16	2
Alternatives (not specified)	Fair price was determined by comparing the scenic airship service with some form of alternative product. Participants in this category did not specify exactly which alternative was being used do compare against	21	11.2	3
Guess	Fair price was guessed	21	11.2	3
Location	The geographical location of the scenic airship service was used as a determinant of fair price	20	10.7	5
Assumed Costs/Profit	Fair price was determined by participants through assuming what the costs associated with the service would be and/or what return would be required to make a profit	19	10.2	6
Food/Drink	The food and drink included in Option 1 was used to determine a fair price	14	7.5	7
Scenery/Views	Fair price was determined to some extent by the scenic attractions that would be flown over as part of the scenic airship service	11	5.9	8
Affordability	Fair price was determined to some extent by what the participant deemed to be affordable	10	5.3	9
What's Included (other than food/drink)	Fair price was determined based on what is included as part of the scenic airship service, e.g. wifi.	10	5.3	9
Adventure Activities	Fair price was determined to some extent by comparing the scenic airship service with adventure activities, e.g. skydiving or bungee jumping.	9	4.8	11
Tourist Activities	Fair price was determined to some extent by comparing the scenic airship service with other tourist activities. Participants did not further specify these activities.	9	4.8	11
Uniqueness/Novelty	Fair price was determined to some extent by how unique or novel the participant saw the scenic airship service to be	9	4.8	11
Luxurious	Fair price was determined to some extent by how luxurious the participant saw the scenic airship service to be	9	4.8	11
Amenities/Technology/Facilit	Fair price was determined to some extent by the available amenities on board the scenic airship service	9	4.8	11

Intuitively Fair/Reasonable	Fair price was determined intuitively	7	3.7	16
Airline Flight	Fair price was determined by comparing the scenic airship service with commercial airline flights	6	3.2	17
Cruise	Fair price was determined by comparing the scenic airship service with a cruise	6	3.2	17
Assumed Competition	Fair price was determined to some extent by the number of competitors the participant assumed the scenic airship service would be competing against	5	2.7	19
Willingness to Pay	Fair price was determined by how much the participant would be willing to pay	5	2.7	19
Boat Ride	Fair price was determined to some extent by comparing the scenic airship service with a boat ride	5	2.7	19
Airship Experience	Fair price was determined to some extent by the expected experience of flying on a scenic airship service	5	2.7	19
Comfort	Fair price was determined to some extent based upon the perceived comfort that the participant would experience on board the scenic airship service	4	2.1	23
Other	Fair price was determined by one of the following themes: capacity, service quality, other sightseeing options, comfort, excitement, safety, steadiness, other flight options, up-market/high-end, spacious, Option 2, accommodation, innovative, environmentally friendly, hot air balloon, memorable, social, revolutionary, heritage flights, aesthetics, good idea, or interesting.	35	18.7	N/A

**Table 16. Determinants of Fair Price for Option 2 with Explanations, Number of Participants, Percentage of Participants and Rank**

Determinant	Explanation	No.	%	Rank
Accommodation	Fair price was to some extent determined by comparing with accommodation	51	27.3	1
Food/Drink	Fair price was to some extent determined by the food and drink provided as part of Option 2	43	23	2
What's Included (other than food/drink)	Fair price was to some extent determined by other aspects included as part of Option 2	25	13.4	3
Overnight	Fair price was to some extent determined by the fact that Option 2 was an overnight service	24	12.8	4
Duration	Fair price was to some extent determined by the duration of the service	20	10.7	5
Uniqueness/Novelty	Fair price was to some extent determined by the perceived uniqueness of the service	20	10.7	5
Experience	Fair price was to some extent determined by the experience the participants expected as part of flying on this service	18	9.6	7
Scenery/Views	Fair price was to some extent determined by the value of seeing the views and scenery	16	8.6	8
Option 1	Fair price was to some extent determined by comparing against Option 1	16	8.6	8

Amenities/Technology/Facilities	Fair price was to some extent determined by the amenities provided as part of the service	14	7.5	10
Assumed Costs/Profits	Fair price was to some extent determined by the perceived costs of running the service and/or the desired profit	14	7.5	10
Up-Market/High-End	Fair price was to some extent determined by the participant perceiving the service and high-end	13	7	12
Guess	Fair price was guessed	12	6.4	13
Luxury	Fair price was to some extent determined by the participant perceiving the service as luxurious	12	6.4	13
Intuitively Fair/Reasonable	Fair price was determined intuitively	10	5.3	15
Alternatives (not otherwise specified)	Fair price was determined to some extent by comparing the service with alternatives. Participants in this category did not specify the alternative	9	4.8	16
Location	Fair price was determined to some extent by the geographical location of the airship service	9	4.8	16
Cruise	Fair price was determined to some extent by comparing the service with a cruise ship	7	3.7	18
Modern/New	Fair price was determined to some extent by the modernity of the service	5	2.7	19
Airline	Fair price was determined to some extent by comparing the service with an airline	5	2.7	19
Quality	Fair price was determined to some extent by the perceived quality of the airship service	5	2.7	19
Service Quality	Fair price was determined to some extent by the perceived service quality that would be experienced on-board the airship service	4	2.1	22
Other	Fair price was determined to some extent by one of the following themes: relaxing, not interested, safety, affordability, capacity, expensive, boat ride, helicopter/small plane flight, home, enjoyment, aircraft, location, cool, social, value for money, feeling, spaceship, market forces, willingness to pay, personalised and/or tourist activities.	29	15.5	N/A

## Appendix J – Determinants for Choosing to Purchase

**Table 17. Determinants for Choosing to Purchase Option 1 with Explanation, Number of Participants, Percentage of Participants and Rank**

<b>Determinant</b>	<b>Explanation</b>	<b>No.</b>	<b>%*</b>	<b>Rank</b>
Uniqueness/Novelty	Participants would pay to undertake Option 1 because the scenic airship service was seen as unique	36	26.9	1
Airship Experience	Participants would pay to undertake Option 1 because they wanted the experience of being on-board a scenic airship service	36	26.9	1
Scenery/Views	Participants would pay to undertake Option 1 because they wanted to view scenery from an airship	28	20.9	2
Fair Price	Participants would pay for Option 1 because they felt that their price was fair for what they got as part of the service	20	14.9	3
Duration	Participants would pay for Option 1 because of its duration	12	9	4
Amenities/Technology/Facilities	Participants would pay for Option 1 because of the amenities, technology or facilities included as part of the scenic airship service	10	7.5	5
Location	Participants would pay for Option 1 due to the geographic location of the scenic airship service	9	6.7	6
Value for Money	Participants would pay for Option 1 because they perceived it to be good value for money	8	6	7
Design of Airship	Participants would pay for Option 1 because they found the airship's design appealing	7	5.2	8
Futuristic/Modern	Participants would pay for Option 1 because they perceive the scenic airship service to be futuristic or modern	7	5.2	8
Prefer over Other Transport	Participants would pay for Option 1 because they perceived the scenic airship service to be a better way to travel than alternatives	6	4.5	10
Interesting	Participants would pay for Option 1 because they find the idea of a scenic airship service interesting	5	3.7	11
Food/Drink	Participants would pay for Option 1 because of the food and drink included as part of the scenic airship service	5	3.7	11
Environmentally Friendly	Participants would pay for Option 1 because they perceive the scenic airship service to be environmentally friendly	4	3	13
Cool (Fashionable)	Participants would pay for Option 1 because they perceive going on a scenic airship service as being "cool"	4	3	13
Quiet/Relaxing	Participants would pay for Option 1 because they perceived it to be quiet and/or relaxing	4	3	13
Fun	Participants would pay for Option 1 because they perceive it to be fun	4	3	13

Comfort	Participants would pay for Option 1 because they perceive it to be comfortable	4	3	13
Other	Participants would pay for Option 1 due to one of the following themes: feeling, speed, safety, competitive price, because I came up with the price, luxury, affordability, Option 2, better on rainy days, social, or service quality	21	15.7	N/A
Indecipherable	Participant's reasons for wanting to pay to undertake Option 1 were not able to be deciphered	6	4.5	N/A

\*Note that this percentage is of the 134 participants who would purchase Option 1.

**Table 18. Determinants for Choosing to Purchase Option 2 with Explanation, Number of Participants, Percentage of Participants and Rank**

Theme	Explanation	No.	%*	Rank
Airship Experience	Participants would pay to undertake Option 2 because they wanted the experience of being on-board a scenic airship service	21	25.6	1
Fair/Reasonable Price	Participants would pay for Option 2 because they felt that their price was fair for what they got as part of the service	20	24.4	2
Views/Scenery	Participants would pay to undertake Option 2 because they wanted to view scenery from an airship	18	22	3
Uniqueness/Novelty	Participants would pay to undertake Option 2 because the scenic airship service was seen as unique	17	20.7	4
Food/Drink	Participants would pay for Option 2 because of the food and drink included as part of the scenic airship service	5	6.1	5
Comfort	Participants would pay for Option 2 because they perceive it to be comfortable	4	4.9	6
Duration	Participants would pay for Option 2 because of its duration	4	4.9	6
What's Included (other than food/drink)	Participants would pay for Option 2 due to other aspects included as part of Option 2	4	4.9	6
Overnight	Participants would pay for Option 2 because it involved an overnight stay	4	4.9	6
Other	Other reasons include: service quality, accommodation, quiet/relaxing, memorable, not done it before, modern, affordability, safety, value for money, aesthetics, Option 1, interesting, special occasion, luxury, social, stability, amenities/technology/facilities; privacy, fun, location and prefer to other transport.	30	36.6	N/A
Indecipherable	Participant's reason could not be deciphered	2	2.4	N/A

\* Note that this percentage is of the 82 participants who would purchase Option 2.

## Appendix K – Determinants for Choosing Not to Purchase

**Table 19. Determinants for Choosing Not to Purchase Option 1 with Explanation, Number of Participants, Percentage of Participants and Rank**

Theme	Explanation	No.	%*	Rank
Financial Status	Participants would be interested in undertaking Option 1, but it is beyond their financial means	24	45.3	1
Not Interested	Participants were not interested in undertaking Option 1	12	22.6	2
Cost	Participants felt that Option 1 was too expensive	10	18.9	3
Opportunity Cost	Participants thought that the money would be better spent elsewhere	4	7.5	4
Other	Participants did not want to undertake Option 1 due to one of the following themes: fear of flying, not personal enough, not a tourist, inadequate, already seen area, or unsafe.	9	17	N/A

\* Note that this percentage is of the 53 participants who would not purchase Option 1.

**Table 20. Determinants for Choosing Not to Purchase Option 2 with Explanation, Number of Participants, Percentage of Participants and Rank**

Theme	Explanation	No.	%*	Rank
Financial Status	Participants would be interested in undertaking Option 2, but it is beyond their financial means	43	41	1
Cost	Participants felt that Option 2 was too expensive	23	21.9	2
Not Interested	Participants were not interested in undertaking Option 2	17	16.2	3
Opportunity Cost	Participants thought that the money would be better spent elsewhere	10	9.5	4
Prefer Option 1	Participants would rather spend their money undertaking Option 1 and accordingly would not pay for Option 2	9	8.6	5
Overnight Stay is Redundant	Participants see no benefit of staying overnight on an airship	6	5.7	6
Duration	Participants were put off by the duration of Option 2	5	4.8	7
Other	Participants did not want to undertake Option 2 for one of the following themes: inadequate, fear of flight, anti-elitism, scepticism and/or dangerous	7	6.7	N/A
Indecipherable	Participant's reasons for not wanting to pay to undertake Option 2 were not able to be deciphered	1	1	N/A

\* Note that this percentage is of the 105 participants who did not want to purchase Option 2.