Great Kiwi road trips: enhancing New Zealand's tourism industry through better visitor journeys

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Abbreviations and acronyms

ANZSIC	Australian and New Zealand Standard Industrial Classification
BNZ	Bank of New Zealand
CAM	commercial accommodation monitor
DTS	Domestic Travel Survey
EC	employee count
GDP	gross domestic product
IT	information technology
IVS	International Visitor Survey
LTA	local territorial authority
M	median
MBIE	Ministry of Business Innovation and Employment
N	number
RCA	road controlling authority
RTO	regional tourism organisation
SD	standard deviation
TLA	territorial local authority

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Executive summary

If tourism is the business of 'experience creation' (Neuhofer et al 2014), then the transport sector plays a critical role in creating new visitor experiences. The transport network has the capacity to open up or limit wider exploration across a region, influencing where visitors go, how far they travel, and where they might choose to stop in their journey.

The purpose of this study was to gain a better understanding of the expectations, motivations, experiences, information preferences and behaviour of visitors (both domestic and international) travelling on New Zealand's transport network. Such knowledge enables a multi-agency approach combining tourism, heritage and transport to identify ways to monitor and improve visitor journeys and grow local tourism. A further purpose was to trial an innovative method to deliver targeted, during-trip information and gamification techniques to see if this could influence visitor behaviour and improve visitor experiences.

Our approach

A pilot visitor travel survey was trialled in Northland, New Zealand, which also included an information-based intervention delivered via an interactive, web-based application. The survey was designed to follow the experiences of visitors over time, capturing unique visitor travel behaviour information around initial visitor expectations and intended travel plans, actual daily travel information during the trip, and the overall revealed behaviour of visitors. That is, how they actually travelled around Northland, and their level of satisfaction with their journeys across the road network.

A second purpose was to test a method to deliver during-trip information in a fun, interactive format, to promote different visitor experiences, and test whether visitors would explore more of Northland, stay longer or spend more, and whether this would influence their satisfaction, likelihood to recommend Northland to others and likelihood of a return visit.

There are many different technology-based approaches to providing improved information to road users. However, the visitor experience evaluation framework underpinning the application used in this survey has three relatively unique aspects, especially when combined:

1 It leverages off motivation theory, to examine underlying visitor values and reasons why someone travels, as meeting these needs is strongly linked to success outcomes around satisfaction and visitor growth.

2 It uses best practice gamification methods to deliver relevant, local information and challenges to users in an entertaining, interactive way (including facts, quiz items and challenges).

3 It enables evaluation of intervention success in altering satisfaction and behaviour, using an intervention group that received interactive information and a control group that did not (whereas typically internet-based interventions only examine usability and satisfaction with the information).

Visitor insights

Overall, this pilot did not reveal significant differences in behaviour between the control and intervention groups. However, it is important to state this does not mean that this type of intervention would not be successful in future. This study has revealed the value of improved during-trip information (eg to help access key sites and select desirable routes), potential information gaps (eg international visitors understanding the unique activities like cycle trails available to them), and that there is a large opportunity to provide better information.

Unique visitor information was gained around long trip durations, which has implications for achieving a balance between a visitor desire to experience more versus taking the opportunity to be relaxed and avoid fatigue while travelling. There was evidence not only for the desire to engage with information during a trip that supports exploration and discovery, but also their revealed behaviour showed visitors did travel to many sites at a higher rate than planned. This highlights the value of supporting exploration and discovery as part of their journey.

Overall, new insights about journey experiences have been found that support some existing investment initiatives. For example, initiatives like the Twin Coast Discovery Highway, which gives visitors better route options and enables discovery, or the Landmarks programme, which motivates visitors to experience different lifestyles and Māori culture. There is also evidence of the need for improved roadside infrastructure to provide safer access to stops, including better and consistent signage. Moving beyond signage, there is also an opportunity to deliver a higher level of service around key or 'signature' rest stops (and landmarks), and to consider criteria for identifying and supporting these important stops (such as scenic opportunities, road safety, personal security and space between stops).

Recommendations

Recommendations were broken up to reflect transport sector-focused recommendations and then also cross-sector recommendations. We recommend the transport sector considers the following:

1 Development of a national roadside information level of service: Use a hierarchy-based approach to increase the level of service for both signage and route guidance at key locations. For example, use repeated advanced warning signage and improved content for decisions at key route connection points, so drivers are explicitly reminded of key decision-points (see section 6.6.1 for detailed bullet point considerations).

2 Visitor route content: Consider opportunities for innovative 'during route' content that supports existing visitor motivations, such as exploration and cultural star ratings for routes, or the development of location-triggered information to push out to passengers (see sections 6.2 and 6.3 for more on this).

3 Road quality improvements: Continue to focus on fundamental road quality improvements and maintenance programmes based on growth in user demand for roads, as road condition requirements are for the most part equally applicable to visiting and local road users. Provide location-based information and ratings to support road quality expectations (eg understanding of unsealed road locations or driving difficulty ratings), working with agencies such as the Automobile Association and i-Sites to package and deliver this, as well as working with developers (eg compatibility with Google Maps).

4 Visitor fatigue: Duration of trips by visitors indicates the potential for fatigue. Consider monitoring and matching longer trip locations with opportunities to take stops to break up the trip, considering factors such as better information, improved access and advanced warning of desirable stops.

We also recommend considering the following: taking a broader inter-agency approach to delivery, continuing to work with local road controlling agencies, and tourism, conservation and heritage agencies to deliver a packaged visitor experience, enabling content and infrastructure beyond the road and roadside.

1 Signature rest stops and landmarks: Taking a hierarchy-based approach to promote strategic or 'signature' rest stops, as well as significant cultural and historical landmarks, including better information, but also supporting higher-quality infrastructure (such as around road safety). Widen this approach to include cross-sector considerations of these sites, including personal security, amenities that promote relaxation (of potential benefit to reducing fatigue) and scenic experiences (see section

6.6.2). This would complement existing projects, such as the Landmarks Whenua Tohunga pilot (www.landmarks.nz).

2 Signage and access review: Perform a physical signage and access review to identify gaps in roadside signage (based on content and location, including advanced warning signs), access issues (such as visibility of entrances to stops and turn-offs). Ensure this is a cross-agency evaluation to ensure road sign symbols are consistent with tourism industry icons to improve visitor familiarity and early recognition (see section 6.5.3 for more detail).

3 Promote visitor mobile phone coverage information: Provide an accessible map that includes layers of information around known dead zones with no mobile phone coverage, locations with accessible wifi, and free wifi to assist access to key locations, support visitor wayfinding and reduce anxiety on key routes. A more customer-focused approach would allow users to access other relevant layers on this map, such as road quality and driving difficulty ratings, key rest stops or landmarks, and to download this as off-line content.

4 Deeper visitor insights: Collect in-depth visitor insights to complement existing, more representative but 'shallower' data around domestic and international visitors. This could build on the framework, behaviour change approach, and learnings from the application developed in this pilot to enable quantifiable evaluation of visitor experiences and interventions during the trip.

5 Monitor 'discovery': Monitor, map, and understand factors relating to the 'discovery' of specific destinations, where visitors travel to sites at a higher rate than intended or planned. Identifying and understanding why these locations are more successful in the during-trip phase of travel will enable better accessibility initiatives, meet visitor desires to discover new areas and enable regional dispersion.

6 Wider policy implications: Review opportunities to support discovery and exploration balanced against opportunities to promote more sustainable routes and travel modes, to meet wider policy outcomes. In particular, review spatial connectivity around cycling and walking infrastructure (including with accommodation options, key scenic locations and safe connections across roads). This would be of high value, build on existing work (like the New Zealand Cycle Trail), and enable exploration and new visitor experiences (see section 6.2.2).

Abstract

The purpose of this study was to gain a better understanding of the expectations, motivations, experiences, information preferences and behaviour of visitors (both domestic and international) travelling on New Zealand's transport network. Such knowledge enables a multi-agency approach combining tourism, heritage and transport to identify ways to monitor and improve visitor travel experiences, grow tourism and consequently promote regional economic gain. To do this, a pilot visitor travel survey was trialled, including an information-based intervention. The purpose of this was to capture unique visitor travel behaviour information, and to test a method to deliver during-trip information in a fun, interactive format, using motivation theory and gamification methods to promote different visitor experiences in an intervention group (compared with a control group). While the pilot intervention did not reveal significant differences in behaviour, unique visitor information was gained, including a new visitor journey evaluation framework, and evidence of the desire for 'discovery' and during trip information to support discovery. Finally, new insights into journey experiences were found that supported some existing investment initiatives, but would also inform targeted investment to promote a higher level of service of infrastructure and information for visitors.

1 Introduction

1.1 Background

It is well established that tourism can have substantial economic and social benefits not only to the local community (where certain tourist attractions are located), but also to the nation as a whole, both due to the aggregate benefits across locations, as well as through the development of a positive travel image to potential and returning tourists (Eadington and Redman 1991). Contextualising this within the New Zealand environment, statistics indicate that the tourism sector directly contributed $14.7 billion (5.9%) to New Zealand's overall gross domestic product (GDP) in 2017, with current data revealing a remarkable 31.6% increase in tourism's contribution to GDP over the last five years (from March 2012 to 2017; Ministry of Business Innovation and Employment (MBIE) 2017a).

In addition to revenue sourced from key local attractions, the role of subsidiary goods and services (such as accommodation, hospitality and transport) is of high relevance. Illustrating this, the 2017 Tourism Satellite Account revealed that an additional $11.3 billion (4.6% of GDP) of indirect revenue was received by such supporting industries (MBIE 2017a). Within this, New Zealand's transport and travel provisions are worthy of particular attention as they sit at the heart of both direct and indirect tourist expenditure. Indeed, the quality of a country's travel services and transport network not only impacts on where and how tourists travel, it also significantly impacts on their overall experience of the trip itself by helping to create the journey of exploration (MBIE 2016a).

1.2 Purpose

The purpose of this study was to gain a better understanding of the expectations, motivations, experiences, information-seeking, and behaviour of visitors (both national and international) travelling on New Zealand's transport network. A further purpose was to trial an innovative method to deliver targeted, during-trip information to see if this could influence visitor behaviour and improve visitor experiences. To do this a pilot visitor travel survey was trialled, including an information intervention.

1.3 Research objectives

The key research objectives for this study were as follows:

- To identify visitor motivations and factors that could influence visitor satisfaction, including those that could be used to inform an intervention.
- To identify different success metrics to produce a visitor experience evaluation framework that examined: a) shifts in satisfaction (and variation in satisfaction between journey routes), b) behaviour change (including travel and spend behaviour), and c) predicted future tourism growth (including recommendation and revisits).
- To develop and pilot a series of visitor travel surveys in Northland, New Zealand, to examine visitor decision making, including the intended and revealed behaviour of visitors.
- To design, deliver and evaluate an information intervention that aimed to improve visitor experiences and examined visitor desire for different types of information within the pilot group.
- To recommend future investment priorities based on the insights of the pilot, and recommend any alterations to and future use of the visitor experience evaluation framework.

2 Literature review

2.1 The tourist experience

One's destination is never a place, but a new way of looking at things. (Henry Miller 1957)

Many a seasoned traveller will exclaim that arriving at the destination itself is only part of the journey and the real allure of travel lies in its ability to create a holistic experience where individuals are able to fulfil their fantasies and actualise their aspirations, all the while enjoying themselves in a new and interesting environment (Otto and Ritchie 1996). With this in mind, it can be said that the more objective aspects of tourism (the destination, attractions and associated goods and services) work together, not only to form a functional tourist journey but, perhaps more importantly, to create this sought after experience (Dunn Ross and Iso-Ahola 1991).

A common goal of tourist destinations therefore is to better understand how to create the desired experience in an effort to enhance tourist satisfaction. Although a plethora of avenues is available for achieving such a goal, the overall premise for many of these endeavours is relatively simple: the closer the actual experience is to the desires of the tourist, the greater the level of satisfaction, return visits and positive recommendation to others (Yoon and Uysal 2005) – all of which contribute to the growth of a tourist industry**.** Based on this principle, it is vital that any investigation seeking to grow a tourism industry understands the psychological mechanisms and situational factors that help create such experiences and consequent consumer behaviours.

2.1.1 Psychological factors

Though a myriad of psychological processes is in play when examining the construction of a tourist experience, three key interrelated factors emerge in the literature as being particularly influential in determining what kind of experience a particular tourist is seeking (and how it can be satisfied). These three factors consist of: 1) *motivation* (the desire to go to certain places and participate in specific activities that produce sought after experiences); 2) *expectation* (the mental imaginings created of a particular destination and/or activities); and 3) *satisfaction* (the degree to which desires are fulfilled and the extent to which expectations are matched (or exceeded) by the actual experience of the destination (see figure 2.1; Armario 2005; Barsky 1992; Cho 1998; Rodrigues and McIntosh 2014).

Figure 2.1 Psychological processes involved in the creation of tourist experiences

These factors can be thought of as sitting in a continuum, moving through a process of desire, action and evaluation (Otto and Ritchie 1996) and can be seen as loosely relating to the three chronological stages of a given journey that consists of 1) a planning (before) stage, 2) an experiential (during) phase, and 3) a final reflective (after) stage. It is important to emphasise, however, that these categories are not strictly distinct or linear in that a tourist may psychologically move between these stages throughout the duration of an entire journey (as individuals discover new desires, and update plans and expectations) and alter their behaviour based on levels of satisfaction with previous experience. In the following sections, each of

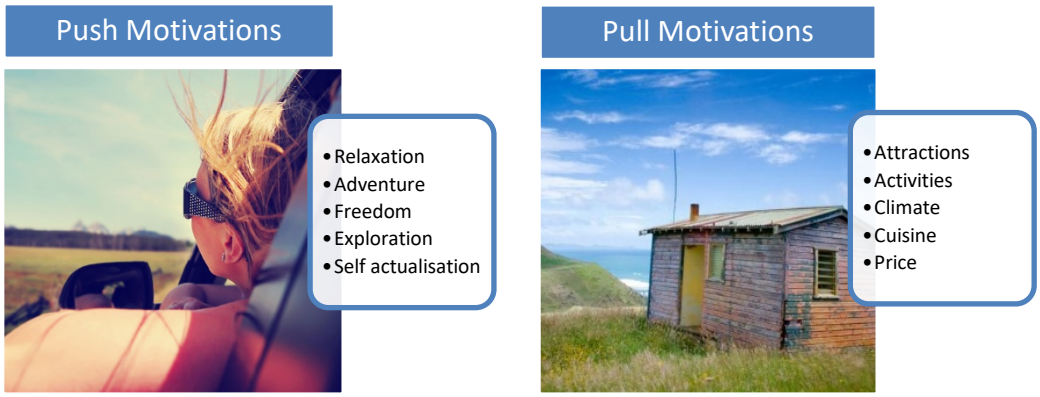
these factors, and their interrelationship with one another, is explained in the context of tourist experience.

2.1.1.1 Motivations: a desire for an experience

The potential tourist is motivated to begin their journey first through developing a desire for a particular experience to fulfil a series of personal needs and/or wants (Armario 2005; Crompton 1979). The tourist is then presented with a series of options to choose from (by way of a particular destination and the activities and services at said destination) within a set of personal constraints (age, income, cost, risk, distance) (Kozak 2002).

In making their decisions, potential tourists are guided by what is commonly referred to as 'push' and 'pull' motivations (see figure 2.2 for an illustration of these two concepts). 'Push' motivations are often described as the internal, affective aspects that lead individuals in their decision making around 'whether' to travel. Such motivations comprise intangible desires and emotions that reflect the personality of the individual, their values and the experiences they are seeking (Uysal and Jurowski 1994). Example travel-related 'push' motivations include the desire for relaxation and calm, novelty, adventure and exploration, and/or the draw of building or maintaining social networks by seeing distant friends and family. It is not difficult to see how underlying psychological desires of this kind can lead individuals to perceive travel as a particularly appealing option given it would enable them to escape their everyday lives in exchange for new, self-constructed, pleasant experiences.

Figure 2.2 Examples of push and pull tourist motivations



Pull motivators, on the other hand, are described as the external, tangible aspects of potential destinations that guide individuals in their decision making around 'where' to travel (Uysal and Jurowski 1994). A wide range of factors fall within this category, including various practical aspects of a given destination (such as the available attractions and activities, climate, cost, safety, culture, cuisine) as well as its overall 'image' which promises to deliver a particular kind of experience for a particular kind of individual (Uysal and Hagan 1993). Successful destination marketing is therefore achieved by marrying these push and pull motivations through well-framed advertising and promotion (Schwartz et al 2013).

2.1.1.2 Measuring push and pull motivations

Using a factor analysis, Yoon and Uysal (2005) present a useful example of how the aforementioned motivations can be captured and subsequently used to predict tourist experience satisfaction. The aim of this study was to capture how motivations were related to subsequent destination satisfaction and destination loyalty (further explained in section 2.1.1.6) in a sample of 148 tourists travelling around Northern Cyprus.

Employing a 4-point Likert scale, the researchers presented participants with a series of push and pull motives and asked them to rate the level of importance of each in influencing their decision to travel to that particular destination, ranging from 1 'Not at all important' to 4 'Very important'.

Their results revealed that the push motives of relaxation, family togetherness, and safety and fun; and pull motives of small size and reliable climate, cleanness and shopping, and night life and local cuisine, were the strongest predictors of satisfaction (and were subsequently related to greater destination loyalty)[1]. Although different predictors are likely to emerge if such a method was to be applied in the New Zealand context, this investigation clearly illustrates that tourists' motivations are practically measurable and can predict important variables of interest.

There are also more indirect approaches to examining visitor motivations, using sources of information such as destination card consumption, with cards that offer free or discounted access to attractions and related services, including transport options (eg Zoltan and McKercher 2015). Other studies have utilised geo-tagged photos (eg Vu et al 2015), and text content and visual analysis of materials in blogs (eg Sun et al 2014) to reveal the desires of visitors.

2.1.1.3 Expectations: anticipated and desired outcome

Through a combination of push and pull factors, tourists choose to travel to a particular destination with the 'expectation' that such a destination will be able to provide the sought-after experiences. In this respect, tourist motivations can be thought of as those aspects of an experience that a person desires; and tourist expectations are the mental representations of those desires being actualised in the real world. Put simply, the combination of motivations and expectations are the ingredients of a traveller's 'day dream', where he or she plays out their wants in the context of a particular place. Using this analogy, the matching (or exceeding) of a tourist's expectations is bringing such a fantasy to life – and the closer the experience is to the mental representations, the happier the tourist.

A number of experts have emphasised that matching experience to expectations is paramount for tourist satisfaction (Barsky 1992; Cho 1998; Pizam and Milman 1993). Following Oliver's (1980) expectancy disconfirmation theory on consumer behaviour, research finds that the overlap between expectation and experience is a strong predictor of tourist satisfaction and destination choice (del Bosque et al 2009; Cho 1998; Pizam and Milman 1993). Thus, there is incentive to better understand how expectations are formed and what factors influence them to identify avenues for providing more bespoke experiences.

Del Bosque et al (2009) present a useful model of tourist expectation formation. Through qualitative interviews and quantitative factor analyses, their results revealed four key factors that significantly influenced the formation of tourist expectations in their sample of 298 Spanish and English-speaking tourists. Across all factors, the findings indicated that, in forming their expectations, the participants were using available information to construct as accurate a mental model of a given destination as possible.

One such source of information was the participants' own past experiences, where they compared features of previous encounters with the features of the future destination and transferred this information from one to the other. Illustrating this relationship, it was found that the more positive the previous experience, the higher the expectations were for future experiences. Indeed, Meis et al (1995) found that former trips influenced how neighbouring or other similar destinations were perceived.

[1] Within this, an important distinction must be made however between motivation and trip purpose, as research has found these to be two separate variables (Moscardo and Pearce 2004).

In del Bosque et al's (2009) model, a similar pattern emerged in the ways in which the participants sought information outside their own experience, particularly about those aspects of a destination that are intangible, such as the service quality and experience (Murray 1991). The two main ways the model suggests tourists sought such information is through external sources (such as advertising companies or brochures) and word-of-mouth conversations. Interestingly, information gathered by word-of-mouth had a greater influence on expectation formation than information from official sources, as it was perceived as being more trustworthy. This has important implications for the impact that previous tourists can have on future tourists through their recommendations. Not only can they influence the potential tourists' desire to visit a particular destination but their recommendations can also shape what the future tourists expect to experience once they get there.

Lastly, but perhaps most importantly, the perceived 'destination image (ie 'the expression of all objective knowledge, impressions, prejudice, imaginations, and emotional thoughts an individual or group might have of a particular place' (Lawson and Baud-Bovy 1977, cited in Jenkins 1999) was found to be the strongest predictor of expectation formation. From this vantage point, a 'destination image' appears to be a complex mental representation of a destination that is shaped by all sources of information (including the stereotypical image that is intentionally portrayed in advertisements). Given its strong influence, any attempts to enhance tourist satisfaction should consider how the destination image is constructed, presented and interpreted by potential tourists.

2.1.1.4 Measuring expectation and satisfaction

Shahrivar (2012) presents a useful measure of satisfaction that examines the gap between expectation and satisfaction. This approach builds on Anderson et al's (1994) conceptualisation of satisfaction, which argues that tourist satisfaction is made up of:

1 Perceptions of service quality

2 Perceptions of service value (price)

3 How the service compares to the tourist's expectations.

Expanding on this, Shahrivar constructed a multi-factorial satisfaction measure that examined these elements across a series of important tourist-related dimensions (including infrastructure, natural beauty, services, cost, reception, accessibility, recreation and shopping facilities, and cultural events) and their features (see the first two columns in table 2.1 for an illustration).

An overall survey was constructed to assess each tourists' level of expectation and satisfaction with a given destination by requiring them to rate each attribute on a 5-point Likert scale ranging from 1 (low expectation/very dissatisfied) to 5 (high expectation/very satisfied). By assessing the mean differences between expectation and satisfaction scores, an overall rating for each attribute was produced. Satisfaction scores that were significantly higher than expectation scores were awarded a 'satisfactory' rating, and satisfaction scores that were significantly lower than expectation scores were rated 'dissatisfactory' – with insignificant differences given an overall 'indifferent' rating.

The methodology employed holds promise, as it is a simple but effective way of not only capturing overall satisfaction, but also identifying aspects of the tourist's trip that are more or less satisfactory and how this relates to their initial expectations. This highlights where specific disparities lie and enables identification of areas for potential improvement.

Table 2.1 Example of a satisfaction metric using an expectation-satisfaction disparity method

Dimension	Attribute	Expectation mean	Satisfaction mean	Mean difference	Sig	Overall evaluation
Infrastructure						
Item 1	Physical distance to destinations	3.25	4.15	+1	.05*	Satisfactory
Item 2	Time to reach destination	4.5	3.5	-1	.04*	Dissatisfactory
Natural factors						
Item 1	Natural beauties	2	3	+1	.15	Indifferent
Item 2	Climate	3	2	+1	.04*	Dissatisfactory

2.1.1.5 Measuring antecedents to satisfaction

In addition to measuring satisfaction, Armario (2005) stresses the importance of determining what *generates* satisfaction. In his study, he investigated the antecedents to satisfaction by looking at three key variables (closely relating to aforementioned work on expectation and motivation) which were:

1 Variables that define an individual's characteristics and motivation (including push and pull motives)

2 The variety and type of activities available

3 The distance to the destination.

Results found that push motives had greater influence over satisfaction (eg the desire for rest and relaxation and interaction with family and friends) than pull motives (eg culture and gastronomy). Such findings suggest that the main source of satisfaction comes from fulfilling the more emotional and personal expectations. Another relevant finding from this study was that the variety of activities available impacted on satisfaction only insofar as they enabled people to have experiences that were not available in their original destinations (ie museums or natural environments), indicating, once again, the fulfilment of a 'destination' image or expectation of the tourist.

On the whole, these findings suggest that measuring and understanding motivations and expectations can greatly contribute to any initiatives that aim to predict and modify tourist behaviour and satisfaction. In doing so, it is advisable that measures not only capture satisfaction (with specific attributes of a tourist's journey), but also those aspects that shape their definition of 'satisfaction' (ie the motivations and expectations that drive them).

2.1.1.6 Destination loyalty

Extending on the well-established literature regarding tourist motivation, expectation and satisfaction, a series of more recent investigations have examined how such predictive factors relate and contribute to destination loyalty (Meleddu et al 2015; Yoon and Uysal 2005). Though various definitions exist, generally speaking, destination loyalty is conceptualised as comprising two key tourist attitudes: 1) the degree to which the tourist intends to return to the said destination; and 2) the extent to which they would recommend the said destination as an appealing option to other potential tourists. Predicting destination loyalty is an area of interest particularly in managerial and organisational spheres, given that greater reported loyalty is likely to equate to larger tourist flows to that destination, and thus, can be seen as a source of substantial economic gains that can be had through growth in the tourism industry (Meleddu et al 2015; Rodger et al 2015; Yoon and Uysal 2005; Zhang et al 2014).

The work by Yoon and Uysal (2005) is once again instrumental here. Their study produced a factor analysis model which showed that the strength of the aforementioned push and pull motives significantly predicted travel satisfaction and consequently greater destination loyalty, particularly for the likelihood of the tourist revisiting the investigated destination.

2.1.1.7 Measuring destination loyalty

Regarding the measurement of destination loyalty, Yoon and Uysal asked their participants a series of questions in three key areas which, combined, formed their overall destination loyalty ratings. Within this, two of the indicators pertained to the participants' personal attitudes towards revisiting using the following two questions:

1 In the next two years, how likely is it that you will take another vacation to Northern Cyprus? (1=not likely at all, and 4=very likely)

2 Please describe your overall feelings about your visit? (1=this visit was very poor, and I will not come again, and 3=this visit was so good that I will come again).

The third part of this variable was designed to measure the extent to which the participants felt they would positively recommend the destination by responding to the following statement:

1 Will you suggest Northern Cyprus to your friends/relatives as a vacation destination to visit? (1=not likely, and 3=definitely).

2.1.1.8 Satisfaction, consumer behaviour and visitor revenue

According to consumer behaviour models, acquiring high levels of satisfaction is vital for product loyalty which is in turn related to profitability (Hallowell 1996). This relationship holds true in the tourism space given the positive relationship between tourist satisfaction, destination choice and the consumption of its goods and services (Kozak and Rimmington 2000; Shahrivar 2012). Building on this knowledge, researchers are now interested in the positive relationship between tourist satisfaction and destination loyalty, ie the degree to which the tourist is likely to return as well as the likelihood of them making positive recommendations to others (Yoon and Uysal 2005). Although there is little direct evidence of the strength of the relationship between measures of visitor satisfaction and visitor revenue (or even proxy measures of revenue), it is intuitive that economic gains can be had through increasing levels of satisfaction, and increased tourist flows through a location.

2.1.2 Sociodemographic influences

In an attempt to better predict tourist behaviour, researchers have examined the relationship between demographic characteristics of individual tourists (such as age, gender, income and education), their motivations, expectations, and levels of satisfaction and destination loyalty. Although considerable variability persists among studies, on the whole they suggest that important group level differences exist which influence subsequent consumer behaviours (Jönsson and Devonish 2008; Shahrivar 2012; Tobin 1999).

Table 2.2 illustrates this point by showing a few examples of the types of differences that can be found across groups on the key aforementioned influences on consumer behaviour (ie motivation, expectation, satisfaction and destination loyalty). While it is unknown to what extent the specific trends would be replicated in the New Zealand context, the variability between the groups highlights the sorts of patterns that can emerge and, relatedly, that investigations seeking to increase tourism flow and expenditure should consider them in their measurements.

Table 2.2 Example group level differences in tourist related psychological factors

Variable	Motivation	Satisfaction	Destination loyalty
Source	**(Jönsson and Devonish 2008)**	**(Shahrivar 2012)**	**(Kim 2006)**
Gender	No significant differences in motives	No differences in satisfaction between age groups	Female student tourists more 'travel involved' than male students
Age	Older tourists = more likely to travel for exploration and relaxation	Younger tourists tended to report higher satisfaction	Older student tourists (40 and over) had greater destination loyalty.
Income	-	Higher income tourists tended to report greater satisfaction	No significant differences regarding source of funding and destination loyalty
Education	-	Higher education tourists exhibited lower satisfaction	No significant differences between academic years

2.1.3 Summary

Better understanding the psychological factors of motivation and expectation not only relate to immediate levels of satisfaction but can also help create a tourism cycle of loyal customers. Fuelling motivation and fulfilling expectations is key for achieving high levels of tourist satisfaction. Intrinsic 'push' motivations could be stimulated by providing potential, current, and returning tourists with information that 'fuels' their specific desires. An example of this could be if the majority of tourists are motivated by a desire for relaxation, then more emphasis should be put in tourist marketing materials and informational sources to highlight opportunities for high-quality relaxation.

Closely related to individual motivations, the literature also highlights the importance of assessing drivers of visitor satisfaction, dissatisfaction and expectation formation (both generally and specific to particular journey attributes). The acquisition of such knowledge would enable the design of information interventions that could help match expectation to reality, both in improving service and product quality as well as through providing framed information to tourists in such a way that enables them to develop more accurate expectations.

2.2 Tourist consumer behaviour

While enhancing the quality of tourists' experiences has great social value in its own right, such experiences would not be possible without the support of a viable and thriving tourism industry which depends on reliable tourist flows and expenditure. An interdependent and mutually beneficial relationship therefore exists between tourist satisfaction and behaviour, and the success of tourism as a business.

To further strengthen this relationship, attention needs to be paid to the 'touch points' between a tourist and the industry itself – where there is an exchange of resources (ie tourist expenditure) and the goods and services of the destination. To develop this trade, where possible, special consideration should be given to how functional components of tourism (ie attractions, goods and services) can be matched with the psychological processes that go on to create a 'travel experience' (Otto and Ritchie 1996). The following sections examine these touch points, both in regards to the key tourist attractions as well as supporting goods and services that facilitate the tourists overall journey. Special attention will be given to potential avenues for growth at each respective point.

2.2.1 Destination expenditure

The word ‘tourism’ often conjures up images of alluring and memorable physical attractions, such as historic buildings, national museums and other built structures, as well as natural landscapes in the form of parks and reserves. The tourism literature lends support to such views, with many experts emphasising that the key to a thriving tourism industry is to build on these images by highlighting and maintaining the natural and built possessions of a particular country (Gray 1982). Reflecting such an approach, the main strategy of New Zealand’s tourism industry continues to focus on its lush flora and fauna that is both beautiful and precious, bringing people from all across the globe under a unified ‘100% Pure New Zealand’ campaign, complemented by additional cultural and artistic experiences such as Lord of the Rings activities and Māori heritage sites (Tourism New Zealand 2014/2015).

The MBIE (2015a) *Regional economic activity report* reveals that New Zealand’s tourism expenditure is concentrated within the ‘Golden Triangle’, comprising Rotorua, Auckland and Queenstown. Consistent with other countries, the travellers’ chosen journey, and their related spending behaviours, are largely determined by which destinations they choose to travel to and what activities they choose to participate in. Therefore, one particularly viable option for growing New Zealand’s tourism industry is through encouraging people to visit previously unknown destinations, going on new routes, and participating in new activities they may not have previously considered.

2.2.2 Services expenditure

Aside from capitalising on the aforementioned types of tourist attractions and related recreational and leisure activities, numerous studies across tourism literature indicate that the success of the tourism market is dependent on the goods and services that accompany the tourist along their journey. These facilitating factors encompass a wide range of businesses that provide for tourist-specific activities as well as day-to-day living. A short description follows of each of the three key areas that greatly influence a tourist's satisfaction with their experience.

2.2.2.1 Accommodation

> *The tranquil beauty of a mountain resort’s setting affords psychological benefits that clearly transcend the physical need to ‘sleep somewhere’. (*Otto and Ritchie 1996, p168)

By definition, travel involves vacating one's usual place of residence and residing elsewhere for a period of time (Shahrivar 2012)**.** As such, accommodation plays a vital role in supporting the tourist on their journey and is a ‘must have’ expenditure on any given trip (unless utilising social networks such as staying with friends, family or couch-surfing). Traditional accommodation facilities range from hotels to motels, to motorhomes, destination resorts, camping grounds, RVs and trailers; whereas more specialist accommodation options include nature cabins, B&Bs, reserves, boat-homes, mansions and more (Morrison et al 1996). When examining tourist behaviour and spending patterns, it is important to attend to their choice in accommodation, as research suggests that different profiles of travellers tend to select different types of accommodation.

Morrison and colleagues (1996) found that, in a sample of 11,617 US respondents, travellers who used specialist accommodation (n = 672) tended to have a higher level of education and higher income; and tended to be travelling for the purpose of outdoor activities or sightseeing (rather than on a city trip or visit to relatives). Further, the results indicated that specialist accommodation travellers tended to spend greater lengths of time planning and organising their trips (supposedly due to the closer link between their place of stay and the activities they wished to engage in). Such findings highlight that, far from being a merely practical service, accommodation has an experiential component that transcends its price or quality. So providing participants with greater and easily accessible information regarding accommodation

options (especially for particular tourist types) would be one mechanism to improve the quality of their experience.

2.2.2.2 Hospitality

Closely related to accommodation, the hospitality services in the form of food and beverage are of high importance for facilitating and, in many cases, enhancing the tourist experience. The work conducted by Kivela and Crotts (2006) illustrates this relationship by showing that, though often peripheral (particularly for tourists on lower budgets), culinary options can act as strong pull motivators for tourists to visit a particular destination. A resonant perspective, the authors comment that 'gastronomy is an inextricable part the holiday experience' (p357).

Bearing this in mind, it may be worth looking at the diversity in the 'types' of culinary experiences different tourists tend to seek and are satisfied by. Kivela and Crotts (2006) present four culinary tourist types; the existential, experiential, recreational and diversionary culinary traveller. The existential traveller is interested in the link between the cuisine of a particular destination and its culture. They tend to seek out more locally authentic food and beverage experiences, in essence to 'eat what the locals eat.' They are motivated by internet reviews and travel magazines and less by 'manufactured' and boutique food experiences. On the flipside, experiential tourists see culinary experiences as part of a larger, more 'fashionable' lifestyle and are drawn as much by the stylish atmosphere and luxury services as much as the quality of the food itself and are therefore drawn to known culinary destinations through travel magazines and marketing.

Unlike the previous two types, reactional tourists are motivated by the practicalities of food and beverage and tend to 'self-cater,' placing more value on familiarity and eating with friends and family. Finally, diversionary tourists are similar to existential tourists in that they are seeking novelty but, differ in that they are drawn by the convenience and luxury of holiday eating rather than the food itself. These tourists tend to be motivated by the quantity and availability of food, rather than its exoticism, and as such, tend to choose to purchase nearby and 'value-for-money' items.

Drawn together, the culinary options that tourists seek and are exposed to have great potential for enhancing the quality of their journeys by matching their experience with expectation. Potential revenue can therefore be had by giving consideration to how to match tourist destination choices and journey planning with culinary options.

2.2.2.3 Transportation

Current definitions of tourism agree that it involves inter-destination and intra-destination travel (Shahrivar 2012). Unsurprisingly therefore, transport is intimately related to the allocation of tourist resources in the form of travel. Aside from direct expenditure, however, other related factors are worthy of consideration given their flow-on effects into subsequent consumer behaviours. For example, research found that the number of places visited (ie a higher utilisation of transport networks and services) was positively correlated to the length of stay (Oppermann 1997). This means that tourists were likely to not only distribute their resources more widely, but would be willing to invest a greater amount in their overall journey.

Given that different locations entice different kinds of tourists due to geographical and activity differences (Marrocu and Paci 2013), it is important to conduct context-specific research in the area of tourist transport and expenditure. Illustrating this, some research found positive relationships between price of transport options, income and transport choices (Moscardo and Pearce 2004). In contrast, a New Zealand study looking at car and air travel by Becken and Schiff (2010) found that, in general, the price of transport was not a major driver of mode choice. Rather, their findings showed that transport choice was more of a function of the tourist group relationships in that more intimate groups of travellers (eg couples

and family groups) were more likely to use cars and would travel more often, at farther distances, compared with other travel parties (but were less likely to travel by air).

Transport expenditure and transport distance were both good indicators to overall visitor expenditure (eg Wang et al 2006). In New Zealand, spending by visitors on transport has increased substantially over the last decade (see section 3.3). However, it was difficult to know whether this was related to increased travel distance or increased transport costs, as there was no targeted visitor travel survey that examines recent visitor trips in enough detail. Overall, even though transport plays one of the most integral roles in determining the growth and success of tourism in a particular location it has been a largely untapped resource.

2.3 Improving the New Zealand journey experience

> *A more exacting and detailed linkage of the attitudes towards the transport and how it serves to inhibit, modify or embrace the travellers experience still awaits exploration.* (Moscardo and Pearce 2004, p31)

It is evident that numerous factors impact on tourist decision making (ie motivations, expectations, satisfaction and destination loyalty) and related consumption behaviours (direct and indirect, goods and services expenditure). Of these factors however, particular emphasis has been given to the role of transport, with many experts attributing the current success of global tourism to transport development and innovation (Duval 2007; Kaul 1985; Page 2009; Prideaux 2000). Despite its importance, however, a gap in our knowledge exists regarding the role that transport plays (Denstadli and Jacobsen 2011; Moscardo and Pearce 2004), not only as a means to an end, but how it is integrated into the very fabric of a tourist's journey in the creation of a tourist experience.

> *Little academic research has been undertaken in order to comprehend the road users' experiences and assessments of routes, road furniture and adjacent facilities, such as rest areas, eating places and lodging offers, and possibilities for motor tourists to pull over at interesting viewpoints.* (Denstadli and Jacobsen 2011, p780)

As such, there is an incentive to better understand the relationship between transport and satisfaction with journeys and trips to and around destinations, given that the transport space holds great promise for encouraging greater tourism experience. The following sections will explore this topic in greater detail. First, a review of the role of transport will be presented looking at travel behaviours and the role that transport plays throughout a tourist's journey. Second, relevant physical interventions will be identified that could capitalise on the role of transport to improve tourist flows and revenue. Third, informational interventions will be covered that could supplement or replace physical interventions. A final set of conclusions will then be made followed by the identification of a viable avenue for application of such research to the New Zealand tourism sector.

2.3.1 Travel behaviour

Embedded in the very phrase 'to travel,' one of the most fundamental and alluring aspects of tourism lies in the idea of voyage, where individuals move from one place to another, not only as a means of getting to the desired destination, but also to experience the journey itself. Illustrating this, a number of researchers have highlighted the role that transport plays in influencing tourists' decision-making processes throughout the duration of their entire journeys including choices around where to go, how to get there and what activities they do (Duval 2007; Page 2009; Prideaux 2000).

2.3.1.1 Destination choices

At the onset of a given trip, the available transport options play an integral role in determining tourist destination choices or 'inter-destination' travel (and vice versa; Johnson and Thomas 1992). On the one hand, this decision-making process is practical in many respects in that the distance to be traversed between the tourist's origin and final destination is weighed up against the cost and convenience of the available transport modes, ultimately determining the choice of whether to 'go' or 'not to go.' From this vantage point, distance and associated transport options can act as a dissuasive factor in that they are perceived as a barrier to achieving one's goals (Nicolau and Más 2006). On the other hand, however, other studies suggest that distance and associated transport modes attract potential tourists as they give people a sense of 'freedom' and 'escape' from their daily lives and associate this factor with relaxation, adventure and engagement (Armario 2005). Framed effectively, the traversing of great distances can act as a source of tourist satisfaction and can encourage relevant consumer behaviours.

2.3.1.2 Mode choice and travel patterns

Tourists are faced with a myriad of choices of where to go and how to get there. Transport plays a vital role in this process, as described by experts Masiero and Zoltan (2013) '...tourists' decision regarding the extent of an area visited is inevitably linked with their choice of transportation'. In their study, Maserio and Zoltan looked at a variety of influential factors that determined transport choice and destination exploration. Through 848 field surveys of summer tourists travelling in Canton of Ticino, Switzerland, their results showed that unobserved variables (such as trip motivations, age, gender and previous experience) influenced decision making around transport modes and exploration behaviour. Demographically, they found domestic travellers were more likely to use public transport whereas male and older participants were more likely to use private vehicles (such as rental cars). More interestingly, however, are their findings regarding the motivations of the tourists and their travel behaviour. Specifically, their results showed that repeater tourists and those who were motivated by 'cultural exploration' (eg visits to historical sites, trying new foods) were more likely to explore a wider proportion of the destination; whereas those with more conservative motivations for travel (eg to feel safe and secure, rediscovering myself) participated in less intra-destination travel. Complementing the earlier research of Debbage (1991), these findings highlight the tendency for special interest tourists to engage in more travel in an attempt to explore the destination more deeply than general tourists (and that special interests tend to develop with repeat visits).

2.3.2 Physical influences on travel behaviours

The strong interdependent relationship between roading infrastructure and tourism has been widely discussed in the literature (King 2007; Seetanah et al 2011; Seetanah and Khadaroo 2009). Tourism infrastructure lists in the top three attributes that determine how competitive a tourism destination is. Within the definition of tourism infrastructure, Crouch (2007, p6) includes:

> *The quantity and quality of tourism's built environment provides for tourist-specific needs such as accommodation facilities, restaurants, transportation facilities, recreation facilities, attractions such as theme parks, museums, and art galleries, exhibition and convention centres, resorts, airports, etc.*

A number of papers discuss the importance of infrastructure regarding various topics, such as scenic routes and roadside facilities (Denstadli and Jacobsen 2011), the provision of environmentally friendly and sustainable transport and travel options (Bimonte et al 2016), and accessible tourism networks (Wieckowski et al 2014). Denstadli and Jacobsen (2011) intercepted self-drive tourists to examine their satisfaction with two scenic roads in Norway, with a sample of 1,286 drivers. They found infrastructure that supported a visual experience was most important (such as viewing stops or scenic rest stops), and

infrastructure that supported an activity-based experience along the route (such as cultural attractions or fishing spots) was next most important in promoting satisfaction and route loyalty. No differences were found in route information such as signage, and satisfaction with signage was high, indicating that gains from improved signage alone would be minimal (although these were established routes). Rather, the recommendation was that the greatest improvement would come from using visual impressions to guide the placement of supporting infrastructure such as picnic areas, cafes, rest stops and viewing locations. So identifying and prioritising the locations that provide a visual experience along a route is critical.

Given the context-specific nature of roading networks and routes, it is of particular relevance to discuss the work that has been done in New Zealand. Recognising the interdependent relationship between tourism and infrastructure, the New Zealand Tourism Strategy (MBIE 2016b) has a series of projects that enhance our knowledge of this space, with a key pillar of success focused on robust national and regional tourism-related infrastructure. Two NZ Transport Agency led projects have investigated tourist perceptions of New Zealand's roading infrastructure via intercept surveys. The first intercept study was undertaken by NZ Transport Agency (2014) and the second by Opus International Consultants Ltd (Burton 2016); the results of these two studies are further discussed below.

The NZ Transport Agency intercept study was undertaken in the Queenstown area in 2014 where 537 international visitors were intercepted. Key findings from this research relating to roading infrastructure and transport links indicated the following:

- New Zealand roads were generally rated easy to navigate. It is noted that the rate was higher for those who came from a country that drives on the left-hand side of the road (91%) compared with those who normally drive on the right-hand side of the road (76%).
- Similarly, the condition of the road was rated as 'good' by a higher percentage of left-side drivers (86%) than right-side drivers (61%).
- Perceived safety of driving a vehicle was also rated very safe by more left-side drivers (95%) than right-side drivers (84%).

The second user intercept study was undertaken by Opus International Consultants Ltd as part of the NZ Transport Agency-led Visiting Driver Project[2]. A series of three driver intercept surveys were conducted in Otago, West Coast and Southland to provide a baseline of 334 drivers' user-perceptions on road safety and satisfaction before a series of roading programmes were carried out to improve said users safety. The findings from this project indicated that all respondents (overseas visitors, non-local New Zealand residents or locals) felt the roads were safe, they were satisfied with their driving experience on the day of the survey, and the level of safety on the road had positively affected their view of the regions as tourist destinations.

All suggestions can be seen in table 2.3 below. Road users who were more familiar with the type of roads were more likely to be specific with their suggestions (ie locals were most specific and overseas visitors least specific or more likely to offer no suggestion). Overall, the suggestions were also likely to be related to overtaking opportunities, which relates to inconvenience, but arguably could relate to scenic experience. Overtaking opportunities were less of a priority for overseas visitors relative to the domestic road user groups.

[2] The Visiting Driver Project is a New Zealand Government signature project established as part of the New Zealand Government's Road Safety Strategy to 2020. The Visiting Driver Project started in 2014, with the purpose: 'to improve road safety for and of, domestic and international visitors, while maintaining New Zealand's reputation as an attractive and safe tourist destination'.

The top suggestion made by overseas visitors was for more overtaking opportunities, followed by wider road shoulders and more signage. If the respondents who made no specific suggestion were removed from the survey, then about one in four overseas visitors (24.1%) suggested improvements that would potentially also support improved scenic route experiences, in terms of more stopping places (10.9%) and improved signage (13.2%).

The top response from non-local New Zealand residents (ie domestic visitors) was for more overtaking opportunities, followed by a reduced number of corners. The locals' top suggestions were for more overtaking opportunities, followed by road design and maintenance, and improving other road user behaviour.

Table 2.3 Respondents' suggested safety improvements to route

Suggested safety improvement	Overseas visitors	Non-local NZ residents	Locals
	%	%	%
More overtaking opportunities	9.4	19.0	23.1
More stopping places	5.7	4.8	3.8
Wider roads shoulders	8.2	4.8	3.8
Review speed limit downwards	3.3	3.2	7.7
Reduce number of corners	1.2	6.3	0.0
More crash barriers	2.9	0.0	0.0
Smoother improved road surface	5.3	4.8	3.8
Reduce number of one lane bridges	3.7	3.2	0.0
More signage	6.9	1.6	7.7
More arrows	0.4	4.8	0.0
Other road user behaviour	2.0	4.8	11.5
Homer tunnel improvements	1.2	1.6	0.0
Road design and maintenance	2.0	4.8	19.2
Nothing required/no suggestion	45.3	31.7	11.5
Other	2.4	4.8	7.7

The wider Visiting Driver Project also identified the following potential initiatives for strengthening the safety of roads and roadsides through infrastructure initiatives along key tourist routes:

- separating traffic via median treatments
- centre and edge line rumble strips
- road markings – directional arrows and no passing areas
- removal of roadside hazards, for example trees
- widen shoulders, corners to provide greater room for recovery from a mistake
- improve notification of and access to rest spots and photo spots
- relocate or provide additional rest and photo spots
- installation of signage to update information on road conditions and travel times
- intersection upgrades where necessary.

The next stage includes a programme of improvement to be undertaken in the Otago, Southland and West Coast regions of New Zealand. The impact of these improvements will be assessed via both future crash analysis as well as through further user-intercept surveys. It is important to note that the development of the

improvements has included consideration of both targeted road safety applications (eg implementation of edge line rumble strips where there is a run-off road crash history) as well as road infrastructure that supports safe journeys, such as good rest spots and opportunities for photography stops.

Brought together, the aforementioned initiatives indicate that substantial work is already underway regarding investigations aiming to better understand and improve tourist infrastructure in an effort to facilitate tourist journeys and experiences. Physical interventions are currently operating in Otago, the West Coast and Southland regions, the results from which will continue to be monitored (particularly regarding driver perceptions) over the following three years. Bearing this in mind, alongside the substantial costs and time commitments required for additional physical interventions, alternative options should be explored that can complement these efforts with a more human-focused, behaviour change approach.

2.3.3 Information-based influences on travel behaviours

The provision of information is key to establishing tourist satisfaction as it begins before the tourist interacts with the destination. With information, one is able to mould the tourist's expectations and influence their experiences upon arrival. In the context of consumer behaviour, Fodness and Murray (1999, p503) stress the importance of information, stating that 'Consumers awareness, selection and choice of tourism and hospitality products depends on the information available to and used by the tourist'.

Echoing these sentiments, several researchers and experts have taken note of the potential benefits that can be gained through successful links between information, travel and tourist interests. The subsequent sections contain a short review of the type of information that is often shared in the tourism industry, followed by examples of innovative techniques which have trialled in overseas jurisdictions for delivering such information. Where possible, interpretations are made of how such techniques could be applied to the New Zealand setting.

2.3.3.1 Information seeking

Exemplifying the importance of information, the aforementioned study by Shahrivar (2012) showed that the *type* of information was a significant factor in determining levels of overall satisfaction with tourist trips to Malaysia. Specifically, the results showed that, while providing practical information was important (eg the location, quality and price of accommodation, transportation, infrastructure, weather conditions), the main gaps between expectation and satisfaction lay in a desire for more experiential and educational information. This includes facts about geography and the historical and cultural significance of particular locations, as well as information about *where* one could *experience* these topics. Put another way, this latter type of information can be seen as the linking of a tourist's interests (which include their motivations and expectations) to specific locations (rather than providing information solely about the location itself).

Tourists were often found to be highly involved and motivated consumers, who chose to invest a substantial level of resources to seek all sources of information (both external and internal) to develop expectations and make important decisions. Such findings closely align with the aforementioned work by del Bosque et al (2009) which showed that information seeking and evaluating is a core process of expectation development. Other studies have noted a similar link between information-seeking and tourist motivations, particularly emotionally driven, push motives (Dey and Sarma 2010; Goossens 2000).

Maser and Weiermair (1997) undertook a risk perception approach, under the premise that the majority of tourist (and general consumer) information-seeking behaviours were driven by the motive to reduce uncertainty and increase the likelihood of a pleasant and valuable experience. They conducted 228 semi-structured interviews with Western Austrian tourists in the spring of 1996. By getting participants to rate information types and risk perceptions, the authors noted the following results. First, participants sought information on the four key factors: 1) accommodation (including hospitality), 2) animation (opportunities to

do dynamic activities), 3) country lifestyle (the culture, history and natural background of the destination), and 4) basic (regarding the price and quality of various options). The preferences for information were more related to the types of leisure activities the participants preferred to do at home (ie family-oriented people were more concerned with accommodation information, whereas exploratory tourists were more concerned with country lifestyle information). Second, the authors noted (among other things) general information-seeking behaviours were strongly linked to the perceived risks associated with transportation.

Put together, the results from this investigation highlighted that visitor motives for particular experiences and activities were stronger predictors of information influence than demographic variables, suggesting that motivation-focused approaches to information sharing would be more effective than a focus on demographic approaches. On top of this, the findings suggested that, not only were risk perceptions associated with general information seeking, but this relationship was particularly evident in the context of transport, where there might be the largest information gap.

2.3.3.2 The digital era of tourism

The advent of information communication technology, alongside the internet of things and cloud computing, has meant that the operational component of tourist information-seeking and consumer behaviours is becoming increasingly digitised (Chiappa and Baggio 2015; Law et al 2014); To paraphrase Chiappa and Baggio (2015), the digital revolution has birthed the emergence of a digital business ecosystem, and consequently, rapid advancements are being made towards smart, sustainable cities and tourist destinations in order to maintain a competitive advantage on the global scale (Batty et al 2012; Callaway 2016; Gaur et al 2015). Thus, increasingly brochures, magazines, travel agencies and various other modes of tourism advertising are being replaced by online searches, both from official sources, as well as through the enablement of social media and crowd-sourcing, ie blogs, reviews **(**Buhalis and Law 2008). What is more, the line between the physical products and services that are delivered on the ground, and the digital exchanges of information and resources are becoming blurred. In the words of Chiappa and Baggio (2015, p146):

> *In such a context [smart tourism], the physical and virtual components are strongly structurally coupled and coevolve to form a single system, implying that all modifications, changes and perturbations originating in any one of them rapidly propagate to the whole system.*

Due to the speed of development in this space, the digitisation of tourism is being referred to as a 'mega-trend' and is readily seen on social media sites (eg Facebook, Twitter, Instagram), which are not only being used by tourists themselves, but are increasingly being joined by tourism businesses and advertising companies who are directing potential travellers to their social media pages and related websites (Xiang and Gretzel 2010).

It is for this reason that many are seeing the sharing of information, on both the supply and demand side, as crucial to competitive success, and cooperation is needed between all relevant parties (ie tourists with other tourists, stakeholders with tourists, and stakeholders with other stakeholders) in an effort to move towards a common vision (Chiappa and Baggio 2015; Funikul and Chutimaskul 2009; Law et al 2014).

2.3.3.3 Gamification

Leading the way, one of the most current and popular methods for creating smart-tourist destinations is through the use of digital technology (computers, smart phones, tablets) and the techniques of gamification (Kennedy-Eden and Gretzel 2012; Nunes and Mayer 2014). Defined as 'the application of game elements to a non-gaming context' (Deterding et al 2011), gamification capitalises on the current patterns of technology innovation by using spatial and geographical information to create an interactive platform that weds tourist activities with their informational needs, enhancing consumer behaviour and experience (Maan 2013). In the words of Maan (2013, p9) 'the effectiveness of gamification lies in its

ability to measure, influence and reward target user behaviours' – acting as a persuasive technology that is designed to change attitudes and behaviour through social influence (Bogost 2007). Recognising its potential, it is predicted that 70% of global organisations will be exploring or using gamification as a means of maintaining an innovative and competitive advantage (Garnter 2011; cited in Xu et al 2014).

Given the complex nature of tourist and gaming psychology, however, it is important that any application in this space integrates the needs of both types of users (ie tourists and gamers) to account for the differing and overlapping types of motivations. Xu et al (2015) developed a hierarchy of importance in their exploration of the motivations through a series of focus groups with 26 Chinese students. Curiosity was perceived as being the fundamental driver, followed by destination exploration, socialisation, fun and fantasy experiences, with challenge and achievement being the least important (though nevertheless still a driving factor).

Mirroring patterns of information seeking, these motivations encapsulate both external motivations (ie activities completed in order to acquire some type of external outcome or reward) as well as internal motivations (ie activities that are inherently and immediately satisfying to the user driven by an internal desire to play (Ryan and Deci 2000)**.** Indeed, Deterding et al (2011) argue that gamification can only be successful if there is a match between the mechanics of the game and the users themselves (ie their values, needs and interests).

A myriad of techniques exist regarding the application of these motivations to real-world settings (which can be easily adapted for tourist purposes). There is a wide range of different game design elements, and gamified techniques that are used at each level of a given game or application (for example see Deterding et al 2011; Xu et al 2015). Common game component examples include:

- social elements: social graphs, teams, leaderboards, gifting, and avatars
- gameplay elements: combat, time constraints, limited resources, turns
- reward elements: achievements, unlocking, quests, badges, levels, and virtual goods.

To put these elements into play, various game mechanics are used which, as described by Xu et al (2014) are 'responsible for the function of the game and give the designers the facility to guide the players behaviour' (p 528). Examples of such mechanics are described by the authors and include, challenges, competition, changes, cooperation, feedback, resource acquisition, turns, win states, rewards and transactions. Combined together, the game elements and game mechanics can be used to create a dynamic that allows the players to actualise their aforementioned motivations (eg fun, fantasy, fellowship). Xu et al (2015) emphasise, however, that while these approaches can produce the desired experiences, they are not sufficient in and of themselves and careful consideration needs to be put into understanding how to make the game engaging and meaningful to the specific group of users. Illustrating this point, used in the wrong way, rewards can actually de-motivate users as they are by nature extrinsic rewards, and thus can dampen the intrinsic satisfaction of the game (Werbach and Hunter 2012, cited in Xu et al 2014). Done well, however, gamification holds much promise in providing an innovative and meaningful approach to engaging tourists with their chosen destinations.

The techniques of gamification to the tourism sector have been applied in a number of contexts, including air travel quality (American Airlines 2013), destination choice and participation, hospitality (Vittal 2011) and retail (Edwards 2011). Unfortunately, due to the novelty of this approach, few studies exist that provide success metrics in regard to the applications' ability to produce the desirable results (Sigala 2015; Gretzel et al 2015). Nevertheless, three examples have been identified that give some insights regarding the potential effectiveness of applying the gamified method to influencing tourist experiences.

2.3.3.4 TripAdvisor's funware

In light of the current knowledge gap regarding the impact of gamified tourist applications, Sigala (2015) evaluated the funware (ie the game mechanics used to encourage certain behaviours and produce desired experiences) of the well-known online trip planning programme 'TripAdvisor'. Adhering to gamification principles, TripAdvisor uses a combination of a personal profile tracking components and a social networking component made up of forums and messages, with an option to link one's TripAdvisor activities to Facebook elements (see figure 2.3). While many aspects of this application are practical in nature, the introduction of funware elements created an experience of 'play' when interacting with the platform. Example features include point systems, badges, leader boards, social media linkages, photo and map uploads.

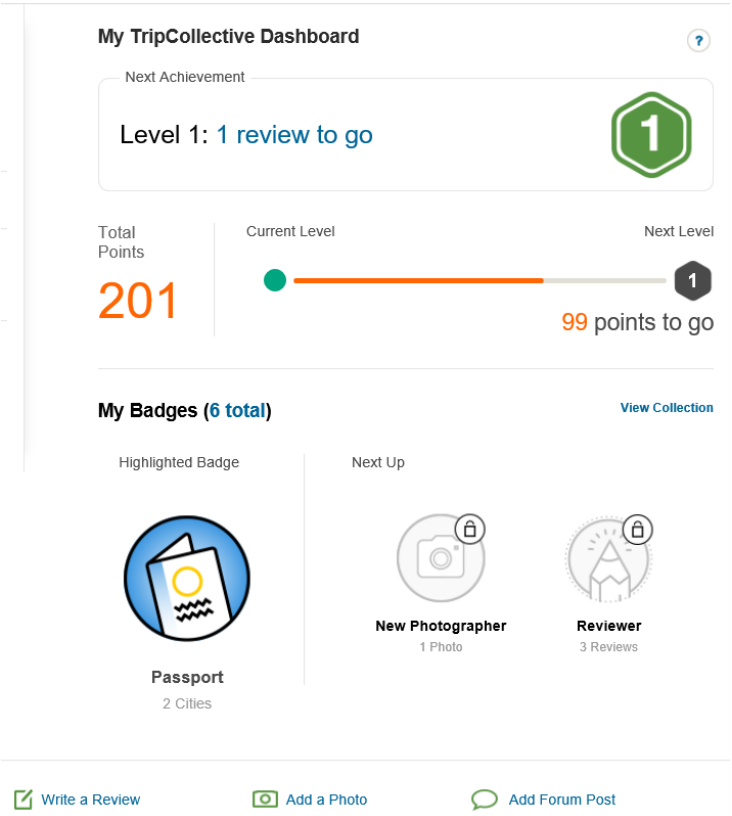
To better understand the impact of this product, Sigala examined 463 surveys completed by tourists on the following variables:

1 Experiential quality of the funware using Mathwick et al (2001) experiential shopping value scale (with added items to capture social and relatedness values).

2 Influence of the funware on the traveller's decision-making process using a scale developed by Sigala (2012) for the purpose of 'measuring the impact of geocollaborative portals on travellers collaborative trip planning processes' (p197). This scale was useful for capturing the effect of the game features by adding items to capture how TripAdvisor influenced the enjoyment and fun of one's planning process.

3 Impact of using funware and game mechanics for live planning and how they experienced places in real time using a series of items compiled by Tussyadiah and Zach (2012) to measure the ways in which travellers experience places (with alterations made for the suitability of the specific context of the study).

Figure 2.3 Example TripAdvisor personal profile page showing gamification elements to encourage reviews and photo and forum posts



The results from their study revealed that the funware had significantly increased user engagement with the website tasks as demonstrated by a comparatively higher rate of use by members. Second, the study found that users of the gamified Facebook application contributed a greater amount of content, were more likely to interact with others and updated their travel at a greater rate than non-users, illustrating the importance of the social aspects of gamified applications and the benefits that can be drawn by linking up with existing social media programmes. This was complemented by the finding that social aspects of the funware were one of the three key experiential values, alongside customer return on investment (ie convenience, time saving, trip planning support) and enjoyment/immersion.

Regarding the participants' decision-making processes, through factor analysis, the results showed the gamification elements of TripAdvisor had an impact on all stages of the trip planning process, including the process of planning itself, the outcomes of the planning as well as the collaborative and social aspects (with the planning itself factor being deemed as most important).

Finally, the findings of an additional factor analysis revealed the funware aspect of TripAdvisor had a significant impact on the real-time tourist experiences of places during their travel journeys. Specifically, their results found the game mechanics had positively influenced the participant's knowledge and understanding of the destination of places, as well as self-reported behaviour regarding their activity to, from and within the respective places. Additionally, the participants reported feeling more emotionally and personally connected with visited destinations. Bringing together the sentiment across findings, the results showed the overall experience of the trip was reported as being significantly more positive due to the participant's interaction with TripAdvisor's funware.

2.3.3.5 The Ilha Grande Mix

Nunes and Mayer (2014) examined the concept of the Ilha Grande Mix, an application designed to facilitate tourist activities on an island off the Rio de Janeiro coast in Brazil. The application had practical qualities in that it enabled the tourists to track and visualise their travel when interacting with the natural environment of the island (eg feedback information on their routes, places of interest that were found, duration of particular routes). Additionally, the application had more hedonistic 'pleasure' focused game elements, which incentivised exploration of the park through the use of badges and progress bars. This game component was then complemented by the ability to share one's successes and challenges with others using a website. As a final, but important factor, the application linked the tourist's behaviours with local service providers (eg restaurants, hostels, health clinics).

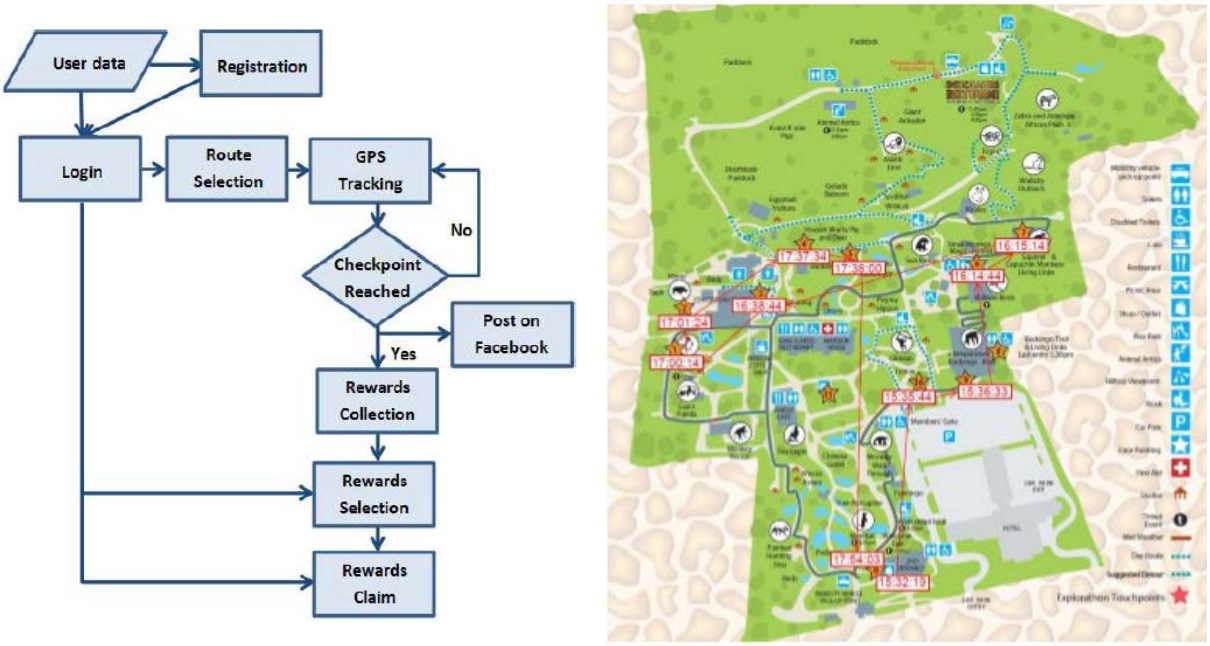
Using variables of perceived usefulness, ease of use, compatibility, enjoyment and intention to use, the authors interviewed 378 tourists regarding their perceptions of using this application between 17 and 21 February 2012. Their results found that this application was perceived as being useful, fun, easy to use, and compatible with the location – and consequently, reported a strong intention to use it in the future. What is more, they found that the application appealed to both hard eco-tourists (those with the intention of being highly active and involved with the natural environment) and soft eco-tourists (those primarily concerned with relaxation). While the purpose of this application is particularly relevant to the New Zealand context, there was no controlled testing of how this impacted on behaviour change.

2.3.3.6 SUMMIT

Lim et al (2016) evaluated the application of a modified version of SUMMIT, a mobile application designed to gamify a tourist's experience and encourage walking and hiking, in a zoo setting at RZSS Edinburgh Zoo as part of an 'explorathon' event. The system tracked movements, provided checkpoint locations to be reached, allowed social sharing (ie posts on Facebook) and the selection and collection of rewards (linking to local businesses). Figure 2.4 shows the application process followed by the application and an example

journey around the zoo by a user (with stars indicating checkpoints reached and the red box showing the time at which the checkpoint was reached).

Figure 2.4 The SUMMIT application showing the process behind the application (left) and a visual example of a zoo visit (right). Source: Lim et al (2016)



SUMMIT had two main components, one web-based interface for businesses to manage the rewards they provided to tourists, and one for the walkers using the phone application. This system was different from other tourist checkpoint applications in that it allowed flexibility in the checkpoints required to receive rewards (users do not have to cover all checkpoints or follow any particular order) and in the reward structure (offering users choice in their reward).

The usefulness of different components of SUMMIT was evaluated. For example, route information including photographs of each checkpoint and descriptions of the terrain were determined to be useful by most. There were some age differences, where younger users rated the route information, ease of use and rewards (extrinsic motivation) higher than older users. As users moved between checkpoints the motivation shifted from the initial benefit of a reward (like free wifi, sweets or physical 'explorer' badges personalised with a name) to the desire to reach all checkpoints (a more intrinsic motivation).

There was one user comment indicating the application was effective at encouraging return visits. However, no control group observations of tourists moving around the zoo were examined to provide any ability to judge whether SUMMIT increased exploration of the zoo (ie behaviour change). This is similar to most evaluations of gamification interventions, making it difficult to discuss the benefits beyond user satisfaction or anecdotal evidence.

2.3.4 Summary

Although many avenues exist for enhancing tourist experience and growing tourism, the role of travel and transport is worthy of particular attention given its integral (but less understood and monitored) involvement in many aspects of a traveller's journey. While there is some evidence that indicates scenic viewing locations are a key consideration for the placement of supporting infrastructure (like rest stops), which will in turn improve visitor experiences and route loyalty, there is limited evaluation around the success of general route

branding exercises. There is a knowledge gap and a call for improved evidence examining the relationship between visitors' road user experiences, supporting roadside infrastructure, information about travel routes and visitor behaviours, such as exploration, activity and spending behaviour.

One particularly fertile approach for filling this knowledge gap lies in the use of information and information technology, to educate, inspire and motivate tourists to go places they may not have otherwise gone using transport modes that may have been previously neglected. The tools provided by gamification principles and techniques are a particularly promising vehicle for this transference and distribution of information. Indeed, many researchers, experts and stakeholders alike are employing such methods already, with some evidence to suggest positive attitudinal changes as a result. However, there is an information gap when it comes to empirical investigation of behaviour change as a result of these studies, as most application evaluations do not use control groups, or examine before–after shifts in attitudes, knowledge or behaviour.

2.4 Summary of literature

Tourism, at its core, is a business of 'experience creation' (Neuhofer et al 2014). Though many psychological processes are involved, the literature identifies motivations (both push and pull forces), expectations (and their formation) and satisfaction (at both the specific and general level) as three key factors due to their strong relationship with subsequent consumer behaviours, return visits and recommendation to other potential tourists. Interventions focused on motivations, as opposed to demography, will provide better success in encouraging visitors to explore a greater number of places and purchase and experience a wider range of goods and services.

The role that transport plays within this process is of particular interest given that, despite being a relatively unexplored avenue, it nevertheless determines where people go, how far they go, and in many cases what they do once they arrive. Indeed, the current boom in the global tourism industry has been attributed to leaps in transport technology, enabling tourists to travel with comfort and convenience as never before, at relatively low cost. However, there is a large information gap when it comes to understanding how to capitalise on transport.

Overall, direct links between visitor motivations, expectations, satisfaction, and actual spending behaviour and economic growth are limited. Therefore, building a monitoring tool that evaluates the potential impact of a short-term, controlled intervention on a visitor group is relatively unique. Physical and information-based approaches were evaluated to inform potential interventions for the current study.

Physical interventions involving infrastructural changes of the given destination are one option for enhancing transport experiences, exemplified by a number of studies which have explored and trialled various options for improving tourist routes (two of which are currently underway in New Zealand). Given their long-term, high-cost nature however, it is advisable that additional interventions be sought that can complement the physical environment.

Information technology (IT) and the techniques of gamification present a viable means to educate and inspire visitors to travel with greater alignment to their core values and motivations. Supplying people with readily available and relevant information could be used to reduce the sense of uncertainty around their trip, particularly in the context of transport, a factor which has been found to be a deterrent for greater exploration. Moreover, the employment of gamification techniques can help boost motivation by delivering information that is interesting and meaningful to specific groups of individuals in a way that is both extrinsically and intrinsically rewarding, while also providing them with the opportunity to share and connect with other users of the product (a feature that has been shown to be particularly motivating).

While many agencies are trialling these IT-based approaches, with positive reviews and recommendations for improvement, very little evaluation of either change in overall visit satisfaction or behaviour has been examined. If well executed, the application of gamification techniques for the purpose of enhancing tourist journeys should significantly improve a tourist's journey experience, which in turn should have positive ramifications for the destination itself in benefits from greater expenditure and tourism flows.

3 Existing tourism data relating to the Northland region

3.1 Overview

There are several sources of longitudinal secondary data that can be used to estimate concentrations and patterns of tourist activity, which includes travel routes and itineraries. More traditional sources relate to the nature and geographic location of activity, while more recent IT-based sources allow for detail on both location, travel route and travel timing, meaning there is a substantial volume of information that is available for analysis and interpretation. This information may be augmented by one-off surveys or other sources (for example, where regional tourism organisations (RTOs) undertake consumer survey through on-line or other methods). For this reason, it is often considered a viable option to combine and reconcile the various data sources in order to construct a fuller picture of tourism and tourist activity.

3.2 Data sources

3.2.1 Commercial accommodation monitor

The commercial accommodation monitor (CAM) provided by MBIE and Statistics New Zealand provides monthly volumes of capacity and activity in places offering accommodation (MBIE 2016c). Key indicators include numbers of establishments by type, visitor nights and unit nights, by month. The granularity of the data is defined to the regional level (ie based on territorial local authorities (TLAs) or RTOs). The survey also depended on operator responses, where non-response from known establishments was estimated in order to provide the continuity of data based on approximations.

3.2.2 Business demography statistics

The Business Demography Statistics provided by Statistics New Zealand (2017) provide an annual snapshot of establishments by type (Australian and New Zealand Standard Industrial Classification; hereon in referred to as ANZSIC) and employment (employee count; here on in referred to as EC. This offers a refined geographic base to allow reasonably precise location data (to meshblock level), although data suppressions for reasons of confidentiality mean that employment often needs to be estimated. The EC data does not include working proprietors unless they are also employees of the establishment, so that activities such as motel operation commonly have their real employment understated. This data is useful (in combination with data sources like the CAM, Domestic Travel Survey and International Visitor Survey (IVS)) for estimating the numbers of visitors and visitor nights at a refined location level, based on the employment in accommodation (and other) facilities in each location.

3.2.3 International visitor statistics

The Tourism Research and Data survey offers historic data to the present day (MBIE 2016d). Statistics NZ's NZStat[3] provides quarterly tables derived from the IVS. The IVS measures the travel patterns and

[3] NZStat is a free Statistics New Zealand web tool that allows you to create tables from a wide range of large datasets, find a dataset by browsing through themes or searching, customise the table by selecting the variables you want and changing the table layout, view metadata alongside the table and download your table in Excel (up to 100,000 cells) or comma separated values format (up to a million cells).

expenditure of international visitors to New Zealand. Data includes expenditure, places visited, activities/attractions, accommodation and transport. Unfortunately, the only information the survey can provide at a regional level is whether a region was visited and the 'spend' in that region. The rest of the available data is at a national level only. The expenditure data is divided into the following categories:

- dollar spend by country of origin in each RTO and region
- accommodation services
- cultural, recreation, and gambling services
- food and beverage services
- other passenger transport
- other tourism products
- retail sales - alcohol, food, and beverages
- retail sales - fuel and other automotive products
- retail sales – other.

The data comes with appropriate caveats and cautions to help put parameters on any data analyses.

3.2.4 Domestic Travel Survey

The DTS was run from 1999 to 2012 (MBIE 2016e). It surveyed approximately 15,000 people each year nationally. Trips were separated into overnight and day trips. An overnight trip was defined as any travel that included at least one night's accommodation away from the respondent's usual home. A day trip was defined as a return journey of at least 80 km (40 km one way) – outside of the area where the respondent usually worked or lived – that was completed within a single day. The survey included accommodation, activities, trips and spend data (for accommodation, alcohol, food and beverages, gambling, gifts, recreations, transport and other).

While useful in offering multiple accommodation categories, the DTS was limited in that the data was incomplete, with a number of lower-cost accommodation options not represented (eg bed and breakfasts, motor inns). Moreover, some of the regional cell sizes (ie the number of people interviewed conforming to that category) were very small (<5) making the estimates very imprecise at the regional level. Once again, the data comes with appropriate caveats and cautionary advice (which it is up to the analyst to heed)[4].

3.2.5 Domestic visitor statistics

The domestic visitor statistics provide monthly estimates (April 2008 to June 2016) of dollar-spend by type of good or service (same categories as for the international data series; (Statistics New Zealand 2016).

3.2.6 Accommodation survey

The accommodation survey is accessed via Statistics New Zealand's Infoshare database (Statistics New Zealand 2016). The Infoshare database has been set up to provide a wide range of official time series

[4] The DTS information is available on NZStat: http://nzdotstat.stats.govt.nz/wbos/index.aspx

data. The tourism information available at the appropriate level is derived from the accommodation survey which includes:

- guest nights
- domestic guest nights
- domestic guest nights: seasonally adjusted
- international guest nights
- international guest nights: seasonally adjusted.

3.2.7 Other tourism-related information on Infoshare

Other tourist-related information on Infoshare is not available at the appropriate level and thus does not fit our purpose. The Northland Regional Tourist Organisation (RTO) provides monthly statistical updates on accomodation survey data and spend estimates (NorthlandInc 2017).

3.2.8 Information on the MBIE website

MBIE has a section of its website called *Tourism insight series*. It includes a report on 'Regional dispersal and seasonality' that indicates regional dispersal has remained flat, with only 35% of visitors travelling to 'non-gateway' regions outside Auckland, Wellington, Christchurch and Queenstown (MBIE 2016f). MBIE has also published a tourism flows document which shows tourist flows throughout the nation including Northland by all modes of travel (Vuletich and Becken 2007), though this work is somewhat out of date having been published in 2007.

3.2.9 BNZ Marketview and Paymark datasets

The BNZ Marketview[5] and Paymark[6] datasets offer large volumes of information on expenditure (transactions, amounts) by type of outlet (defined by ANZSIC), by location (of merchant), by time of day and date/day of week. Visitor status is defined according to the home address of New Zealand cardholders, for a subset of around 17% of all adults nationally (BNZ customers). The Paymark dataset identifies cardholders according to country of residence, and typically it is possible to combine or reconcile the Marketview and Paymark datasets. Data is not available for individual merchants for reasons of confidentiality; however, when grouped to avoid confidentiality issues, the data offers useful information on where and when cardholders have travelled, how long they have stayed in a location, and the sequence of their spending provides a clear view of their itinerary (especially at the TLA or RTO level). This data is used extensively for MBIE tourism estimates, as well as for customised analysis (eg by CruiseNZ to identify the shore travel and spending patterns of cruise passengers) and events analysis (eg Rugby World Cup (RWC) analysis of travel patterns and direction of visitors attending for the RWC events, by country of origin).

[5] www.marketview.co.nz/

[6] www.paymark.co.nz/products/eftpos/

3.2.10 Mobile phone data

Mobile phone data, like that provided by Qrious[7], offers considerable potential for more precise identification of travel patterns, by capturing the mobile phone registrations with cell (service) towers. Potentially (depending on the information which the providers are prepared to analyse) the data could identify the origin of travellers, the travel day and date (for seasonality and time of week analysis), travel time of day/night, as well as travel route (at least outside of main urban areas), stopping places (within the day's trip, and overnight, according to the time at which phones have registered with towers), and repeat visits.

The large volume of data that is potentially available means it is possible to establish the main patterns of travel within a region (particularly the main routes followed in a region such as Northland) and places where travellers stop over at night, and/or pause during the day. By establishing trip direction, the phone data can also readily distinguish between overnight travel and day trips.

The full potential of this data source will be known once the available variables are identified, and the allowable analysis is known. For example, the service may offer segmentation according to age of phone holder, or identify overseas visitors according to roaming and other services used.

3.3 Selected descriptive analyses related to Northland

The following section takes the data that has been reviewed in the previous section and provides some descriptive analyses to give a picture of tourism patterns in Northland (the location of the pilot study).[8] The analyses are only a sample of the large number of analyses that could be done using this data, and are used to inform:

1 The development of the intervention (what visitor behaviours could/should be influenced)

2 The evaluation of the intervention (including any extrapolation from the pilot sample up the regional level).

3.3.1 Expenditure over time

Figure 3.1 shows data from the DTS which describes how expenditure by domestic tourists has changed over time over various categories.[9] It would appear that the greatest change in expenditure has been in the transport area, almost doubling between 2000 and 2012. It was not clear whether this was related more to tourists covering a wider area in their travels or to transport cost-related factors. However, petrol prices have also almost doubled within the same period (shifting from $1.08/L to $2.12/L)[10].

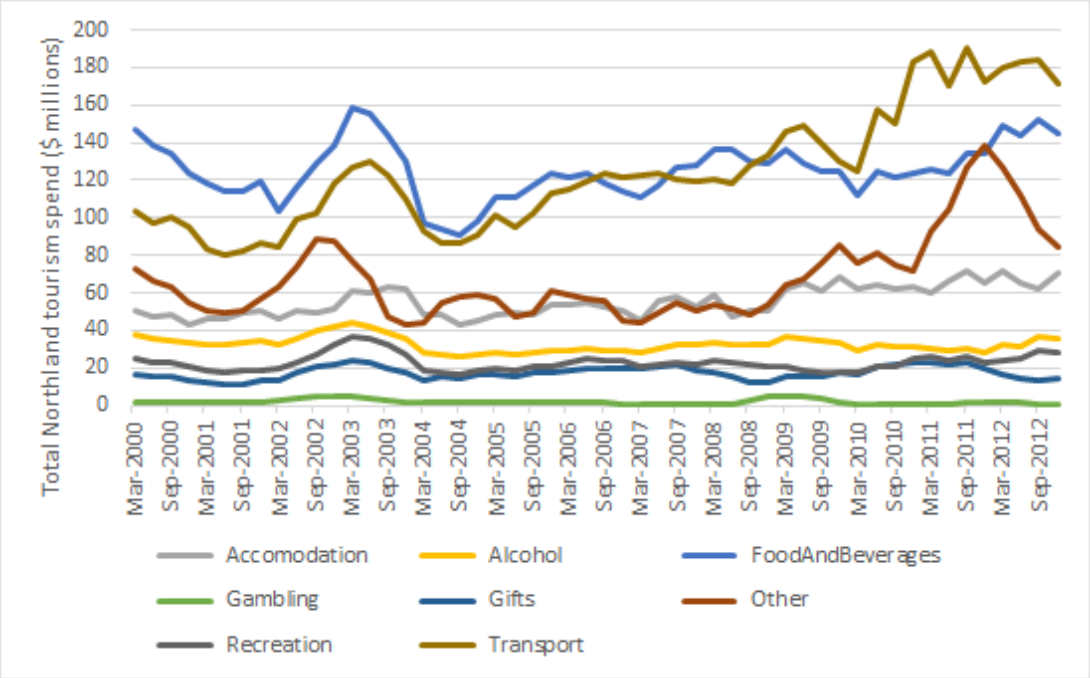
[7] www.qrious.co.nz/products/voyager/

[8] Where spend data was looked at over time, the figures were not inflation adjusted.

[9] More recent spend data at the regional level for Northland (which also indicates a higher level of spend overall) can be located here: www.northlandnz.com/northland-inc/media-centre/news/northland-tourism-statistics-update/

[10] www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/statistics/prices

Figure 3.1 Expenditure by domestic tourists only in Northland (DTS)



Similar information is presented in figure 3.2 from a different source, the regional tourism estimates for international tourists (MBIE 2016g). In this chart transport-related spending is subdivided into fuel and automotive products and 'other'. In both cases there have been increases, but not as large as the domestic increases.

Figure 3.2 Northland expenditure for international tourists (based on regional tourism estimates)

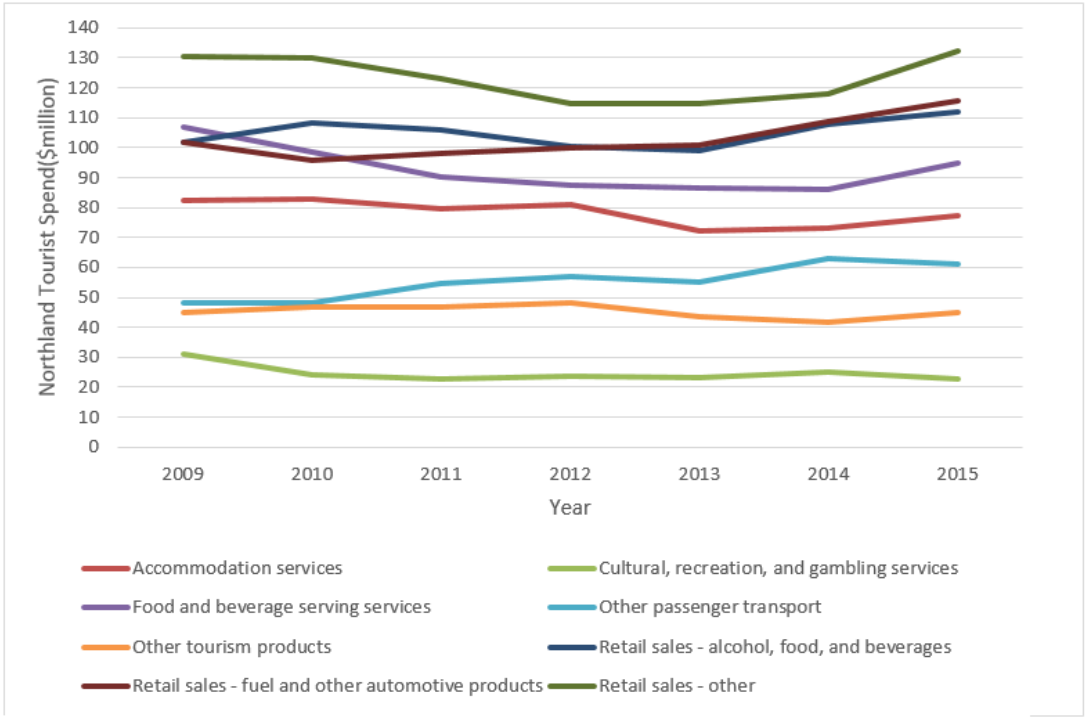
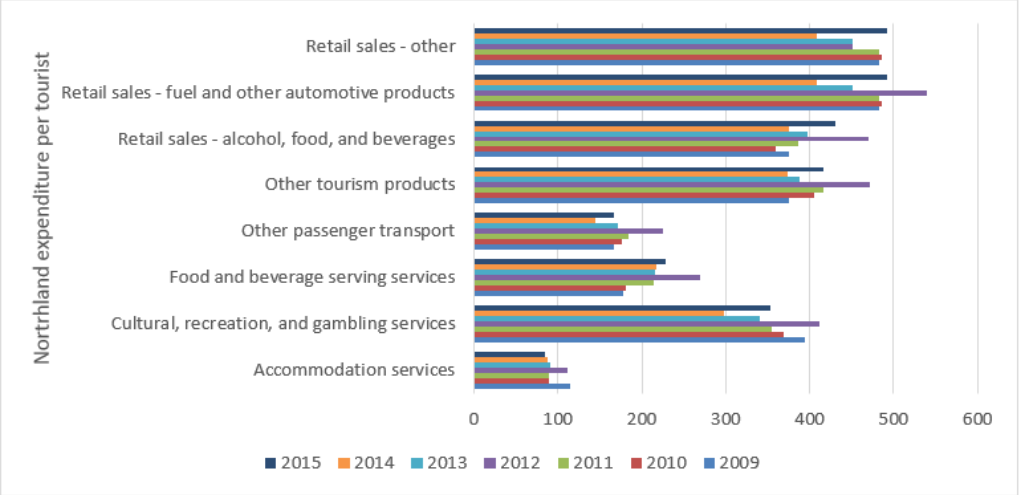


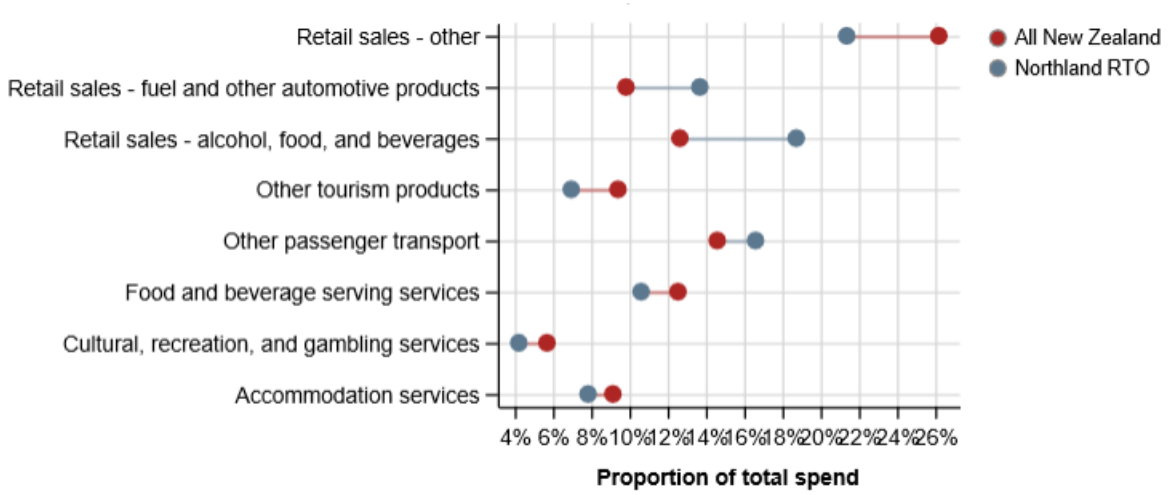
Figure 3.3 shows annual expenditure disaggregated into various categories for international tourists, based on regional tourism estimates of spend. The overall average spend per international visitor was $2,115: SD = 305, taking an average from 2011 to 2015.

Figure 3.3 Annual expenditure per Northland tourist (based on Northland Regional Tourism Estimates examining international tourists, MBIE 2016g)



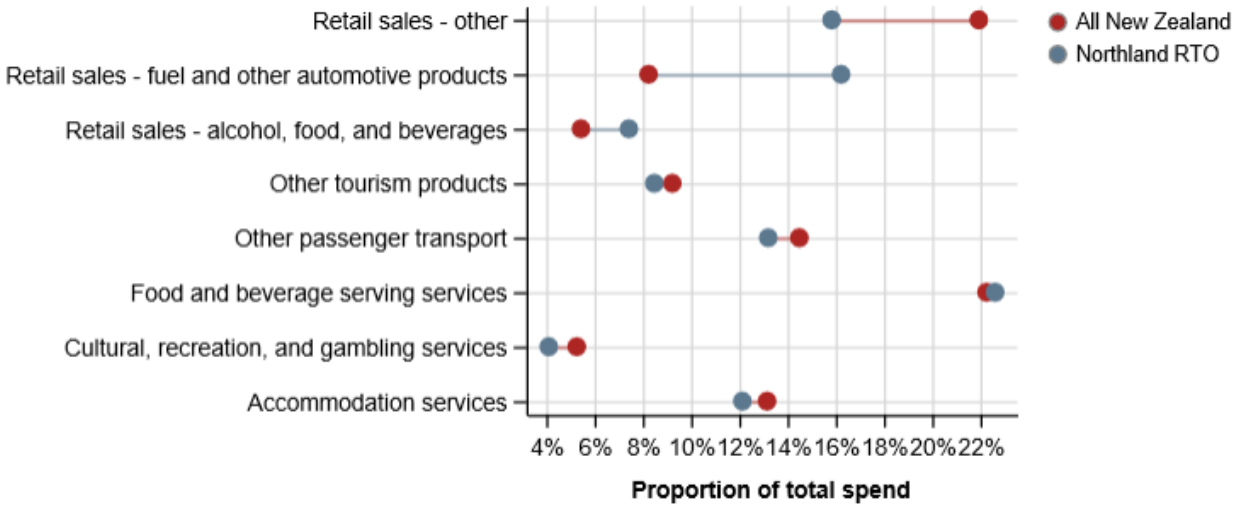
Figures 3.4 and 3.5 show the proportion of tourist expenditure in Northland RTO compared with all New Zealand for domestic and international tourists respectively[11]. In terms of transport expenditure (fuel and automotive costs), this indicates that transport costs are higher in Northland compared with other RTOs, indicating the distance required to travel to the diverse visitor attractions. It also indicates that travel is a core component of the Northland experience. This is particularly the case for international visitors whose fuel and automotive costs represent about 16% of their costs compared with domestic visitors who spend about 13.7% on fuel and automotive costs. Domestic visitors tend to spend more on other passenger transport modes. General retail sales, tourism product, and cultural, recreation and gambling services are lower in Northland for both domestic and international visitors.

Figure 3.4 Proportion of domestic tourist expenditure in Northland RTO compared with all New Zealand (for the year ended 31 August 2016. Source: MBIE, Monthly regional tourism estimates)



[11] These figures are sourced from MBIE: http://tourismdashboard.mbie.govt.nz/

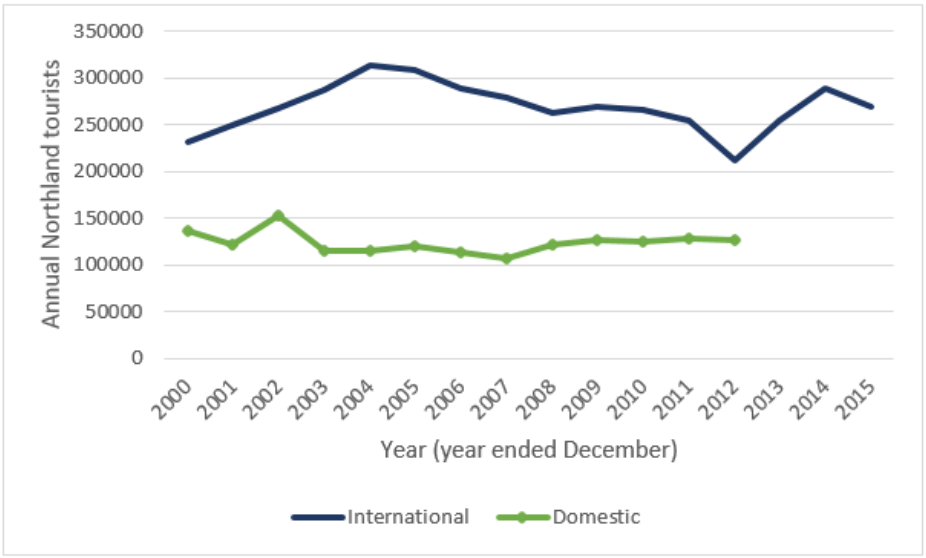
Figure 3.5 Proportion of International tourist expenditure in Northland RTO compared with all New Zealand (for the year ended 31 August 2016. Source: MBIE, Monthly regional tourism estimates)



3.3.2 Visitor numbers over time

Figure 3.6 looks at annual tourists visiting Northland, from the international and domestic travel data (IVS and DTS; using data based on the year ended in December). It is apparent there has been a decline in international visits up to 2012 followed by a recovery, which may be loosely associated with economic recovery although the decline began before the worldwide slowdown of about 2008. Of the international visitors travelling to New Zealand about 1 in 25 (3.6%) visit Northland, and of those coming through Auckland about 1 in 5 (21.2%) visit Northland (based on averaged data over 10 years, from 2006 to 2015). The domestic figures show a decrease in visitor numbers that fits with the economic downturn, with the lowest numbers in 2006 and 2007 and a general increase from 2007.[12]

Figure 3.6 Annual tourists visiting Northland (based on IVS and DTS data)



[12] There is no data after 2012 for the DTS as it was discontinued.

3.3.3 Accommodation type, occupancy rate and seasonal trends

Looking at nights stayed in various accommodations over time shows a consistent pattern in seasonality (see figures 3.7 and 3.8), with visitors more inclined to visit over summer months when there are higher temperatures and lower rainfall. This indicates interventions that would help to diversify, including providing opportunities for visitors when faced with poor weather conditions, would benefit visitor numbers.

Figure 3.7 Nights stayed in accommodation by year and month (DTS)

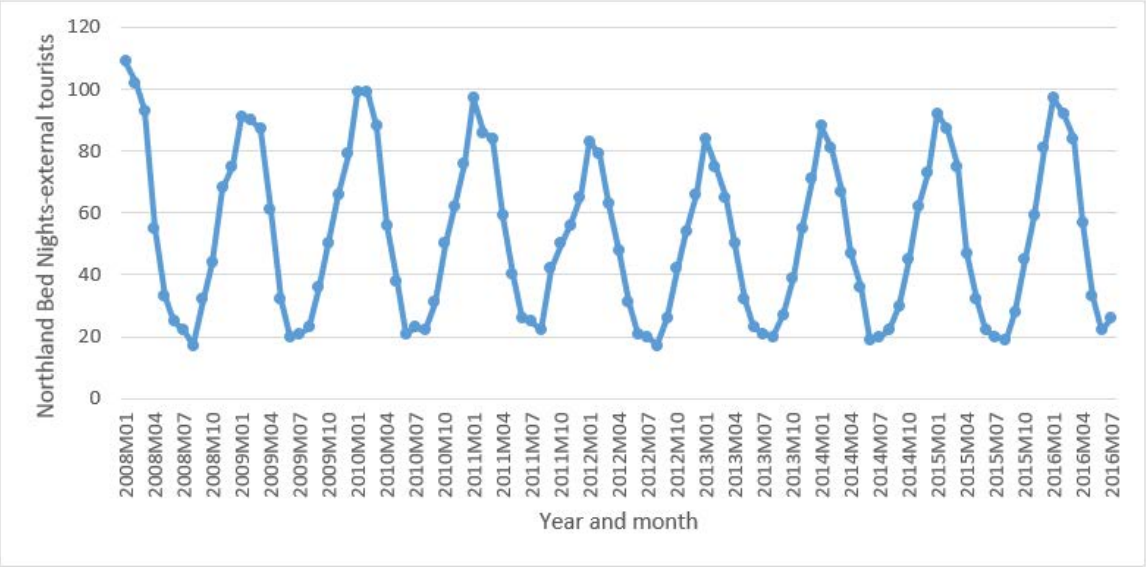


Figure 3.9 looks at the occupancy rates of various types of accommodation in Northland by month for the year finishing July 2016. The information in figure 3.9 is consistent with that in figure 3.8 in terms of seasonal trends, and also indicates that holiday parks may have an occupancy problem.

Figure 3.8 Occupancy rates for various accommodation types for the12 months ending July 2016

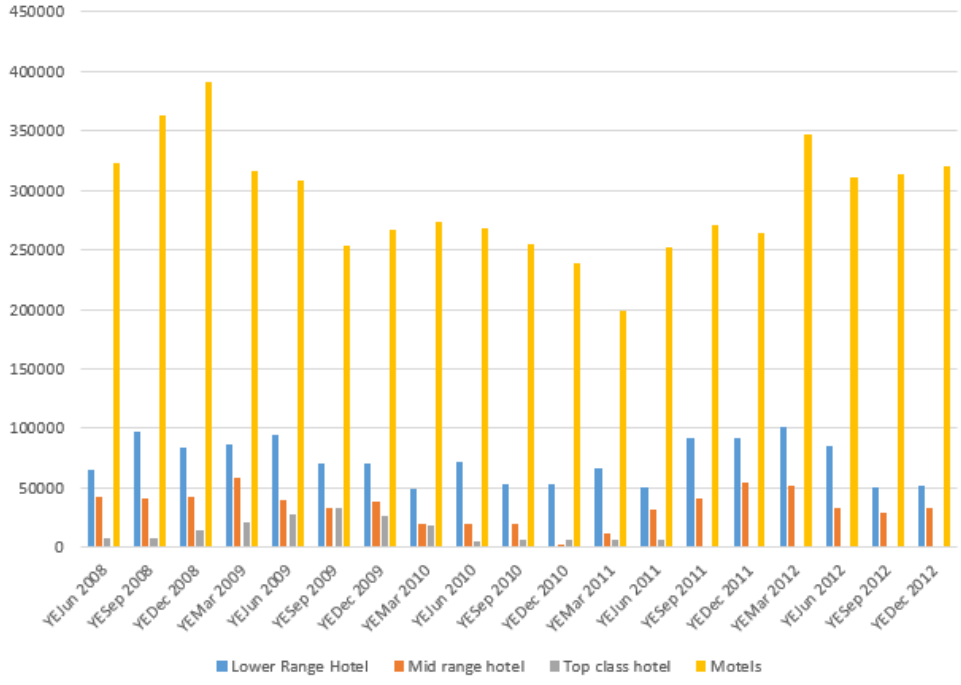
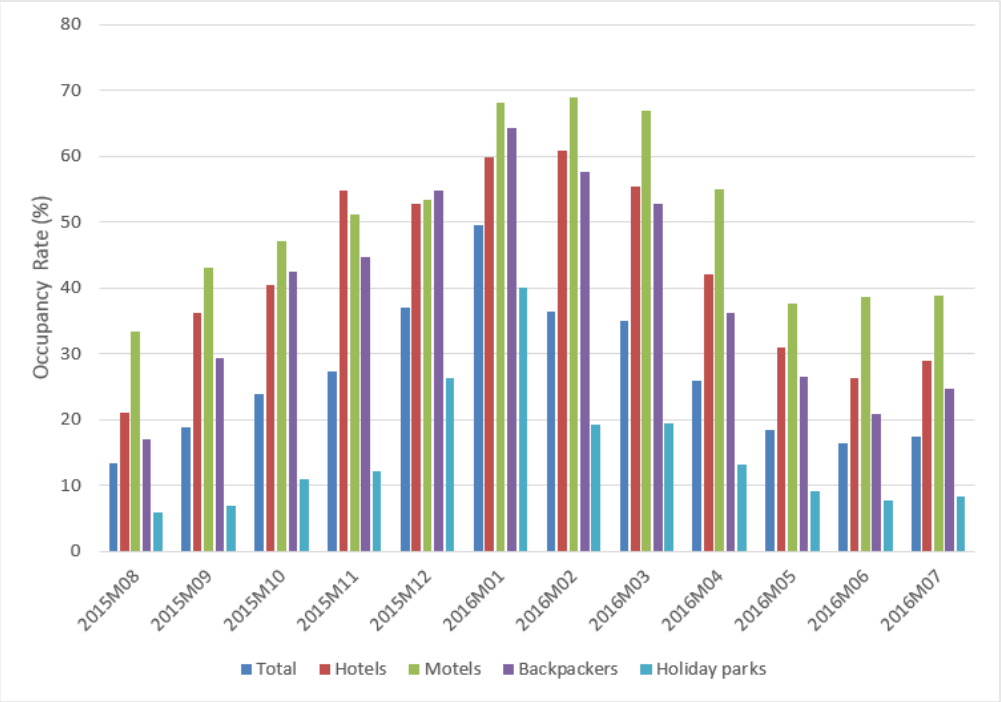


Figure 3.9 Nights stayed in various accommodation by year and month (DTS)



3.3.4 Visitor demand indicators (from mobile phone data)

The maps in figures 3.10 and 3.11 represent visitor days to areas of Northland as detected from mobile phone data (Harbrow 2016; sourced from the Qrious Voyager platform data,[13] which captures data from mobile phones on the Spark network). Not surprisingly, the data indicated more domestic visitors than international visitors (see figure 3.10).[14] Two other trends were apparent:

1 A greater concentration of visitors travelled in the eastern areas (which also aligns with popular destinations)

2 Overseas visitors were not reaching the farther north locations as frequently as the domestic visitors. This information could also be used to match potential tourism sites in less visited areas with information interventions and campaigns to make them more popular with visitors and encourage greater dispersal throughout the region.

[13] www.qrious.co.nz/products/voyager/

[14] Due to significant gaps in mobile coverage, any interpretation around Cape Reinga and Waipoua, two of Northland's main tourist attractions, was limited.

Figure 3.10 Domestic and international visitor numbers for March 2015-February 2016 (based on data at the census area unit level. Source: Harbrow 2016)

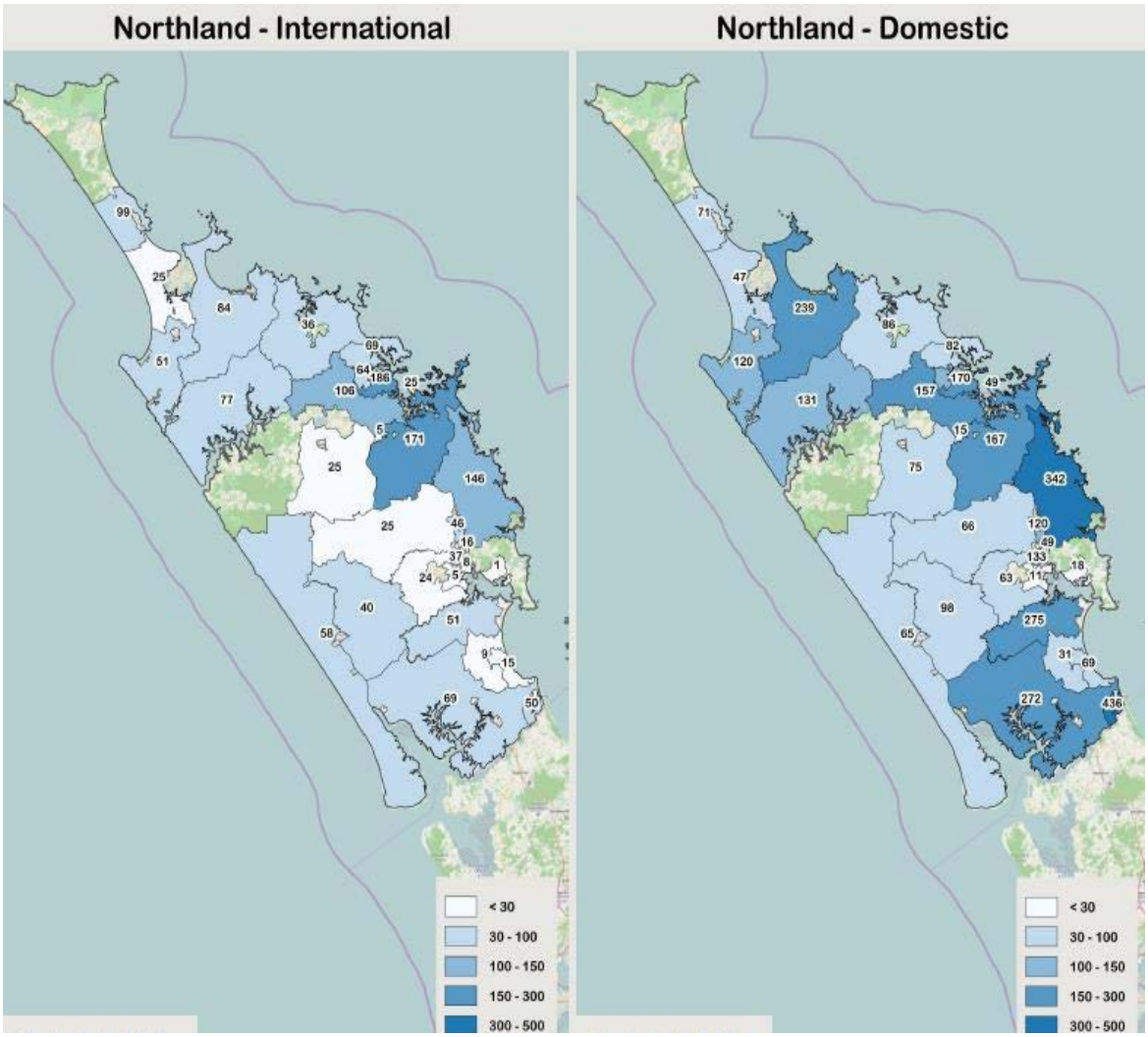
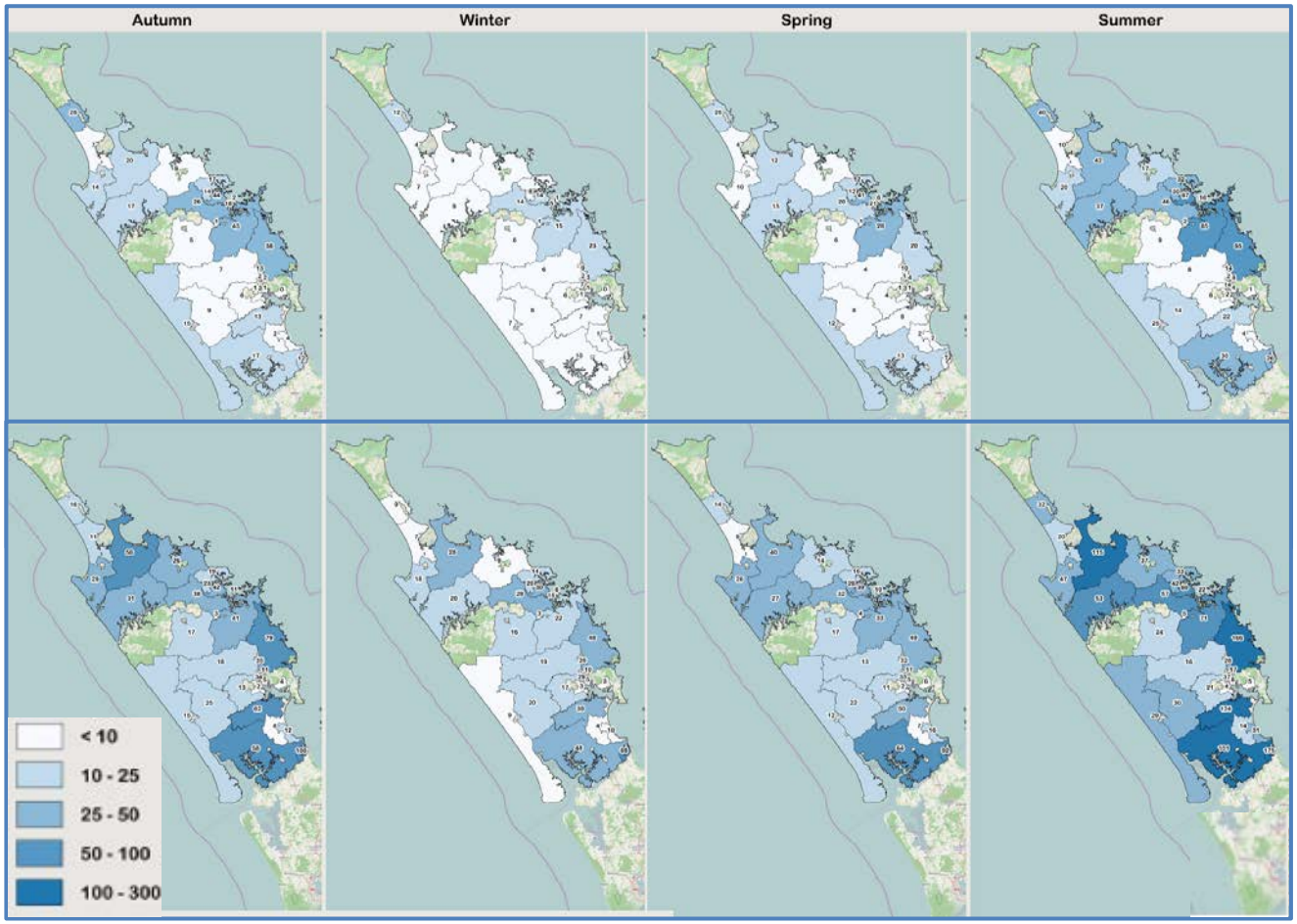


Figure 3.11 shows the popular seasons (summer followed by autumn), which also aligns with higher temperatures and less wet weather. The seasonal trend was particularly apparent for international visitors.

Figure 3.11 Visitor numbers by season for international (top) and domestic visitors (bottom; with visitor numbers represented in thousands. Source: Harbrow 2016)

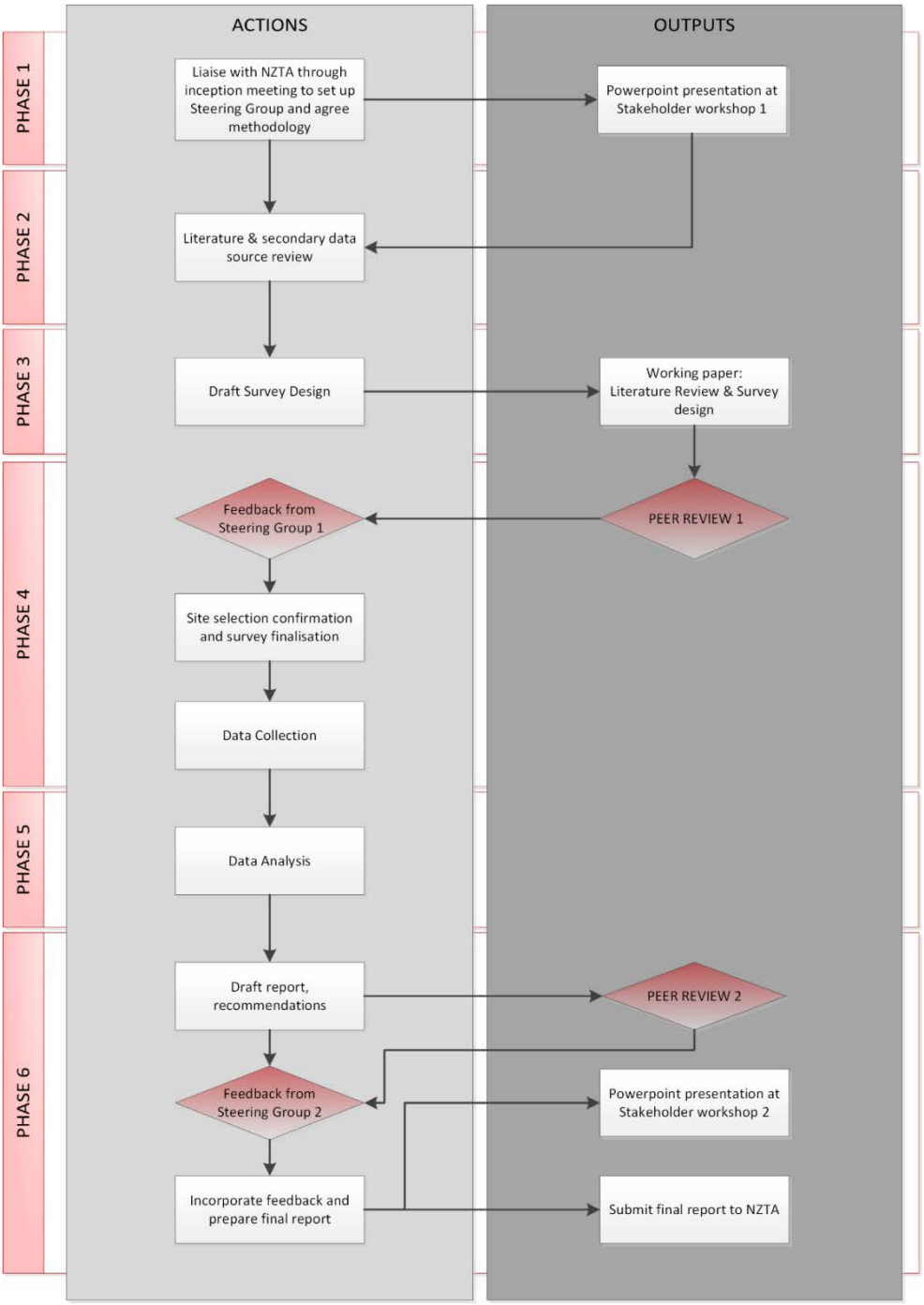


4 Method

4.1 Overview

The project methodology was divided into six phases (see figure 4.1).

Figure 4.1 Flow diagram representing the study data-collection procedure



After the inception phase (phase 1), a review of relevant literature and secondary data was conducted (phase 2). Following this, all relevant materials were developed for the survey and intervention (phase 3) which went through a review process by the challenge group and peer reviewers to ensure suitability for the study's purpose. Having refined all materials and data collection procedures, the data collection phase (phase 4) began in January 2017 and ceased in March 2017, after which all the data was analysed (phase 5). The reporting phase of this investigation (phase 6) involved the incorporation of findings from all sources of information (ie literature review, secondary data analysis, data collection and economic evaluation). The following section outlines the methods for phases 3, 4, 5 and 6.

4.2 Materials

To monitor and influence tourist patterns of behaviour and perceptions, two key methodologies were selected: a series of self-report surveys alongside a web application that was designed to inform and motivate a sub-sample of the participants (ie intervention group) during their visit to Northland by means of gamified information. In both cases, participants were incentivised by points that related to prize draw entries per survey completed. Additional points were also offered for participation in the web-application for the intervention group. Figure 4.2 gives an overview of the delivery, duration and purpose of each stage of the study as well as the reward mechanism.

4.2.1 Survey method

Building on the findings from the literature, the current study sought to capture tourist patterns of behaviour as well as their perceptions of their travel experience by designing four surveys which were administered at key points of their travel journey: at the intercept point (stage one: recruitment), prior to their visit to Northland (stage two: pre-travel), during their stay in Northland (stage three: during-travel) and finally at the end of their visit (stage four: post travel). The second row in figure 4.2 illustrates the delivery process of these surveys.

The rationale behind the choice of this method lies in the survey design enabling the researchers to capture both key psychological variables over time (motivation, expectation, satisfaction) as well as self-reported behaviours (destination choice, number of intended stops, travel budget and intended daily spend). This approach also allowed researchers to track any pattern changes in these aforementioned variables in a way that was both easy for the participants as well as being cost-effective in its implementation (as compared to objective behavioural metrics).

4.2.2 Information intervention method

Based on the literature regarding the importance of information for expectation formation (sections 2.1.1.3 and 2.3.3) and the influence that gamification can have on motivation and travel behaviour, a web information intervention method was chosen as it encapsulated both of these important areas.

In an effort to influence key behaviours and perceptions, a web-based programme was designed to provide gamified information to a sub-set of the sample (ie there was one control group and one intervention group) in an effort to encourage certain behaviours and enhance their experience. This application was designed to be used by the participations during their stay in Northland (see figure 4.2, stage 3).

4.2.3 Survey design

As summarised in table 4.1, four online-based surveys were developed, each of which were designed for a specific purpose, with the aim that each participant would fill in all four surveys.

Table 4.1 Survey type and general description of question areas

Survey type	Description of example question areas
Intercept survey	Intention to travel to Northland, visitor type (domestic or international), travel details, demographic and contact details.
Pre-travel survey	Motivations for travel, expectations for visit, intended travel and spend behaviour.
Daily travel survey	Daily travel (including spatial locations), mode of travel, travel route highlights and areas to improve, and satisfaction with travel.
Post-travel survey	Overall travel and spend behaviours, visit satisfaction, and destination loyalty (intention to return, recommend to others), overall pilot evaluation questions.

4.2.3.1 Intercept survey

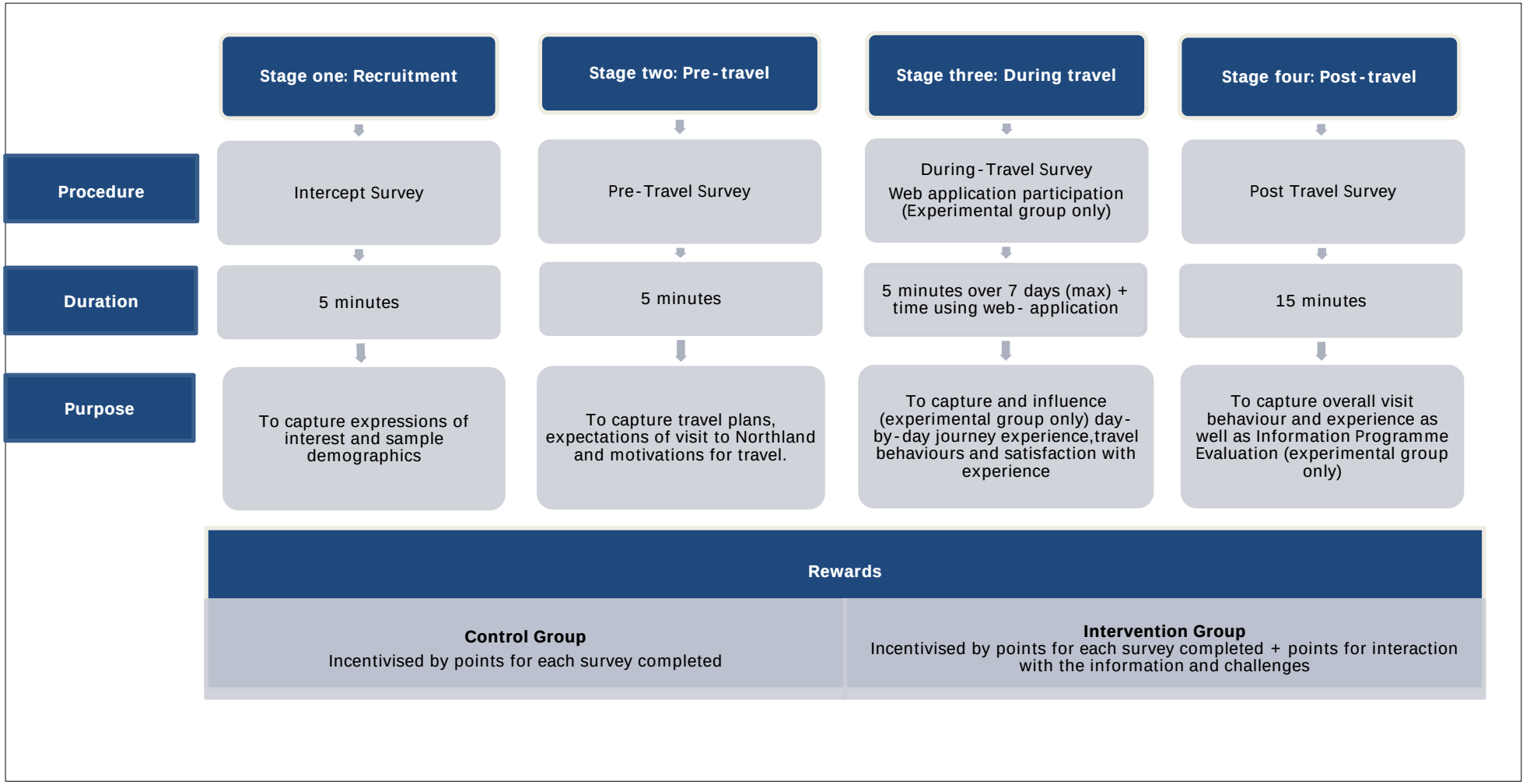
The purpose of the intercept survey was to capture expressions of interest and get a sense of the demography of the sample. As this survey was the first point of contact with the potential participants, additional information was provided that both outlined the study and its procedure as well as its value to the participants themselves (by way of reward incentives) as well as how their responses would be used (to inform tourism services and goods in such a way that it enhances tourist experiences and helps grow the local communities).

As the participants in the control group would not be given as many external rewards (outlined in more detail in section 4.3.2), emphasising the value of the investigation itself was of particular importance in an effort to engage and motivate them to contribute to the study over time.

4.2.3.2 Pre and post travel surveys

The purpose of the pre-travel and post-travel surveys was to capture overall impressions and experiences of the participants' visits to Northland. The survey design aimed to both encapsulate the key findings from the literature as well as carefully match the needs of the current investigation.

Figure 4.2 Flow diagram representing the study data-collection procedure



First, as the research highlighted the importance of transportation (section 2.2.2.3), accommodation (section 2.2.2.1), destination attractions (section 2.2.1), and hospitality satisfaction and its predicted relationship with expenditure (section 2.2.2.2), both the pre-and post-surveys included questions that captured these variables. Specifically, the pre-travel survey captured intended travel and spend behaviours as well as the participants' expectations of their visits. Mirroring this survey, the post-travel survey captured actual travel and spend behaviour as well as overall satisfaction with one's experiences. Such a design enabled researchers to examine the extent to which the participants deviated (or not) from their intentions for travel and spend.

Furthermore, drawing on the research regarding the importance of expectation–satisfaction matching (sections 2.1.1.3 and 2.1.1.5), the pre-travel section of the survey included expectation questions which allowed the researchers to compare expectation and satisfaction ratings, and in turn, identify areas where experience deviated from expectation. Finally, given the importance of motivation to expectation formation and subsequent satisfaction (sections 2.1.1.1 and 2.1.1.8), the pre-travel survey captured push and pull motivations for two reasons. First, it enabled researchers to identify any groupings of individuals based on motivational types (greatly informing the development of a framework for subsequent implantation of this kind of work). Second, it allowed for the assessment of how different types of information might influence people in different ways (by means of group-level motivational categories).

4.2.3.3 Daily travel surveys

The purpose of the daily travel survey was to monitor travel behaviours and perceptions for each daily journey in Northland. Such measurements allowed examination of where participants travelled and any variation in perceptions of specific travel routes (information which is of great value to both local tourist stakeholders and transport agencies).

4.2.4 Web-based application

The web-based application could be accessed using either a visitor's smartphone, a computer or other mobile device (eg tablet, iPad). The application had divergent purposes for the control and intervention group. For the control group, the application was simply used as a means by which the participants could access the surveys themselves and were only provided information regarding the surveys and the study itself. The purpose of the application for the intervention group was to provide information to the participants to see its influence on journey specific behaviour and perceptions (as captured by the daily travels survey) as well as overall changes to visit experience and behaviour (as captured by the pre and post travel surveys).

4.2.4.1 GPS location, privacy, and driver safety

It was initially decided that ongoing access to a visitor's phone for the purposes of monitoring exact location over time was not required for a few reasons. First, requiring ongoing access would have excluded visitors who had an active phone plan and, in an effort to avoid attrition of participants, a less strict process was selected. Second, the chosen procedure lowered the data requirements and usage battery drain for participants. Finally, this approach also mitigated some of the privacy-related requirements (once again, aiding in participant preservation).

During the health and safety review it was determined there was a risk that drivers might use the phone application during the drive. Consequently, a GPS location tracking aspect was required. It was clearly stated that this would only be used for the purposes of estimating speed and sending warning messages. If the application detected movement over 30 km/h a safety message appeared on the screen, and the application stopped working unless participants acknowledged they were a passenger in a vehicle.

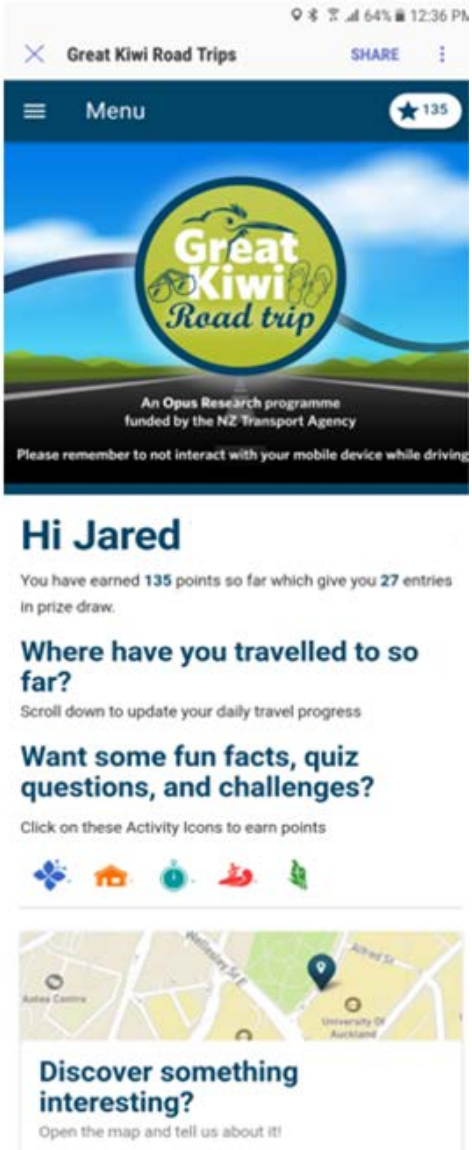
4.2.4.2 Application design

With respect to the user-interface of the application, two key components were developed, the home page and the linked surveys (daily travel surveys and final post-travel survey).

A home page

The home page contained the participant's personal information which kept track of their participation in the study. For the control group, this would let them know how many surveys they had completed (as well as any outstanding surveys) and the amount of points they had accrued for completing them. For the intervention group, this page would provide links to 'areas of interest,' would keep track of points accrued, how they ranked compared with others, as well as additional links through to the daily travel survey and the Facebook page (see figure 4.3).

Figure 4.3 An example home screen in the intervention condition



Interactive daily travel survey pages

This contained a spatial map displaying the latest journey as well as satisfaction information with various aspects of the journey.

4.2.4.3 Gamification and incentivisation

Regarding incentivisation, a combination of intrinsic and extrinsic incentives were used to encourage participation, and for the intervention group to encourage behaviour change. External rewards were provided by the overall points, with those with higher total points having a greater chance of winning either travel vouchers or choosing to commit the reward to support a local conservation charity to improve the area for future visitors. Intrinsic rewards related to competition (seeing how they ranked on the leader board relative to others), completionism (doing all of the challenges), and social motivations (sharing experiences and posting photos on the Facebook page).

Table 4.2 provides a summary of the points system that was employed for rewarding participation in the web-based programme. The points and number of prize draw entries appeared on the home page and in daily text and email reminders.

Table 4.2 Summary of the application point accrual mechanisms

Point mechanism	Description
Survey rewards	The pre-travel survey gave people an initial 50 points. For each day of travel filled in up to 50 points were assigned to participants (up to a maximum of 7 days). A final 150 points were assigned on completion of the final survey.
Daily facts, quiz items and challenges Performed	In the intervention group, between 5–25 points would be awarded for each fact they acknowledged as read, challenge completed, trivia question answered, or photo posted.

4.3 Procedure

4.3.1 Participant recruitment procedure

4.3.1.1 Initial approach

Recruitment was undertaken in two separate weeks, the first in mid-February and the second mid-March 2017. During the first week, an Opus researcher followed a circular route, intercepting visitors at a number of major Northland towns and sites to ask if they would like to participate in this study. This route started and ended at Auckland airport (where visitors were also intercepted at both domestic and international terminals), travelled up the east side of Northland as far as KeriKeri, across to Kaitaia in the west, returning to Auckland Airport via Dargaville. This recruitment process included a number of activities:

- Engaging with local i-Site visitor centre staff to identify key locations for intercepting visitors (for example, the Wharf at Paihia where visitors congregate awaiting their boat trips).
- Providing i-Site staff with information about the study and leave promotional material including posters for the information board and handouts about the study for visitors to take away.
- Engaging with staff at key historic sites and tourist destinations (for example the Waitangi Treaty Grounds, Stone House in Kerikeri, Kiwi North Heritage Park), and provide them with information about the study, promotional posters and handouts for visitors.
- Intercepting visitors over a two to three-hour period, inviting them to take part, and providing handouts to those interested.

- Leaving promotional posters and handouts in shops, on public information boards, in libraries and with local tourism operators, such as a cycle hire business.

After being approached, participants were asked a series of filtering criteria questions to determine eligibility, including:

1 Confirmation they were visiting Northland (for those who were not already intercepted in Northland)

2 Their ability to answer surveys in English

3 Their ability to access the internet while travelling in Northland.

All participants who filled in an intercept survey went through an induction procedure, including either downloading the phone application or using a computer to sign in and develop their Great Kiwi Road Trips unique user profile. At this time the participants were randomly assigned to either the control group or the intervention group.

4.3.1.2 Revised approach

During this first week of recruitment a number of challenges to participation became apparent, which ultimately manifested as low sign-up numbers. Five key factors were identified as key barriers for either the participants (1 – 4) or the researcher (5):

1 Access to reliable internet service

2 Heavy rain and flooding

3 Length and complexity of the pre-travel survey (amount of effort required to sign up)

4 Concerns around privacy (requirement to enable GPS locating when using the phone app)

5 Inability to 'sell' the interactive, fun elements of the 'intervention' group application.

Mitigation measures were undertaken to overcome these challenges (outlined in more detail in appendix A), particularly around shortening the sign-up survey length, choosing a key location with reliable internet, and providing more face time with staff and laptops to support participants to sign up then and there (Figure 4.4 shows two visitors signing up). A prize draw and instant incentives were also offered to encourage participation. A sample of 237 participated in this study (see the Results section for more information on the demography of the participants).

Figure 4.4 Example recruitment setup with two participants signing up

Retention of participants through to completion of the post-travel survey was encouraged by, incentivising them with a large number of points (prize draw entries) being awarded for completing the final survey, as well as follow-up reminders via email and text, and through some direct contact by telephone, which included the completion of post-travel surveys over the phone with the researcher.

4.3.2 Control group procedure

Approximately half of the participants were randomly allocated to the non-intervention condition (ie the control group). A daily prompt was sent to the control group at the beginning of each day by either email or text message (unless they had opted out of this reminder) asking them about their plans for the day and reminding them to complete their daily travel log to collect points and receive more entries into the prize draw.

Participants could fill in their previous travel behaviour at any time. At the end of their travel they were prompted to fill in the post-travel survey and advised of how many points they had accumulated and thus how many entries into the prize draw.

4.3.3 Intervention group procedure

The intervention group followed the same process as the control group, but received additional information and gamification interventions on a daily basis to encourage behaviour change. These interventions included information provision in the form of daily 'did you know' facts, multi-choice quiz questions, and easy, moderate and hard challenges they could complete.

The participants could engage with the interventions at any time during their trip and these were refreshed with new information at the start of each new day (for up to seven days). Within these activities, the participants were also provided with links to additional information about these areas and activities on the Northland Inc website. Participants earned points (for more entries into the prize draw) by reading the trivia, answering the questions and undertaking the challenges. Through interaction with the application they were also able to 'pin' locations on a map, and add a description or provide feedback about these places, as well as share their thoughts, experiences and photographs on the Great Kiwi Road Trip Facebook page for additional point rewards, their accumulated points being displayed on their home page.

4.3.3.1 Visitor motivation group and targeted information

The intervention group also had access to this targeted information from their home page. To provide more relevant information targeted to the needs of an individual visitor (and allow users to select what they were interested in) information was provided based on:

1 Location: Where information was targeted based on the region of Northland relevant to the location of most interest to them (The Far North, The Kauri Coast, The Bay of Islands, Whangarei and surrounds, or Northland general)

2 Motivation: Where information was grouped together based on five different visitor motivation characteristics to cater to a visitor's specific interests, including social, cultural/historic, action, environmental and explorer).[15]

The participants were able to interact with all the intervention information and challenges, for any location and any motivation group, throughout their stay in Northland.

[15] The five categories were designed drawing from the most commonly emergent motivational factors from the literature, which were also agreed by our steering group as relevant to the purpose of the current investigation.

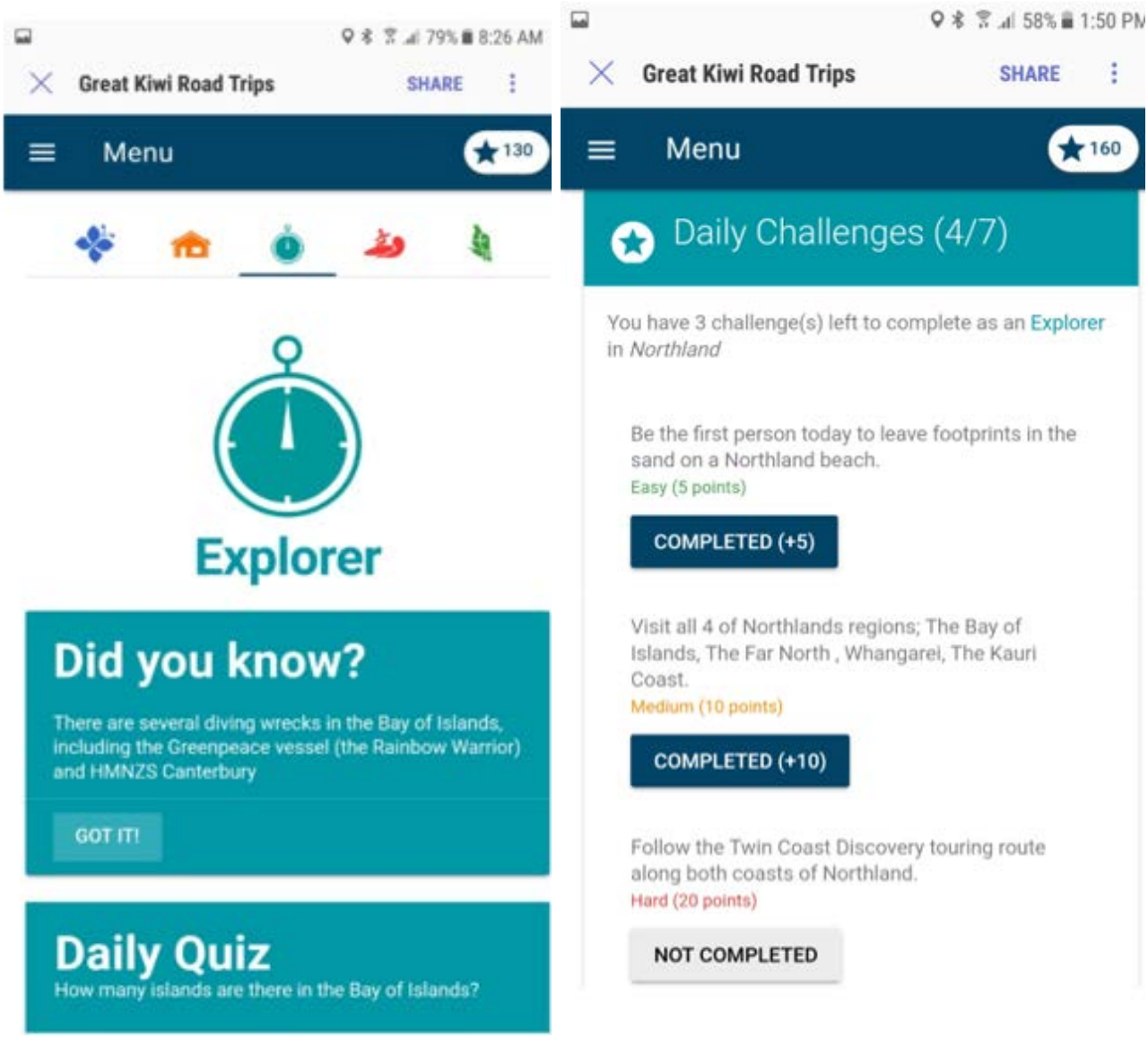
To support ease of navigation in the application, icons were developed to correspond to these groups (see figure 4.5). Targeted information (see figure 4.6 for examples) was delivered based on what was categorised as:

1 Passive information, including fun facts and quiz items that might encourage visitors to find out more and consequently might alter behaviour

2 Active information in the form of challenges in an area that would encourage visitors to visit different locations, engage in different activities, or experience different cultural sites.

Figure 4.5 The five visitor motivation groups used to provide targeted facts, quiz items and challenges

Figure 4.6 Example daily fact and quiz item (left), and challenges (right) for the explorer motivation group



4.4 Rationale for the Northland pilot location

The Northland location includes the geographic area in the far north of the North Island (above Auckland), and was selected for the following reasons:

- The number of visitors over the peak summer season was higher than other locations (eg West Coast of the South Island), which was an advantage to providing a sufficient sample size.
- This location has key tourist destinations which are in high demand, and other destinations with lower demand, where behaviour could be influenced (ie there was the potential for behaviour change around visitor flows and dispersal through the region).
- The potential distances travelled were overall larger than other regions (ie the region relies on the transport network as a key part of its success).

- Visitors make an active decision to travel to this region (ie it is not a thoroughfare to another region), which provides more control regarding any behaviour change, as the decision to travel here would not be influenced by another region.

4.5 Northland region characteristics

Northland is the northern most region of New Zealand and offers a range of activities that benefit from its relatively warm climate (such as beaches, water-based and outdoor activities).[16] This also relates to the seasonal visitor effect, where visits are higher over summer months when there are higher temperatures and lower rainfall (see section 3.3.3).

It has a range of key cultural and heritage sites and consequently has been chosen as the region to trial the Landmarks Whenua Tohanga Pilot.[17] This initiative has identified the following nine key sites: Waitangi Treaty Grounds, Kororipo Heritage Park, Rangihoua Heritage Park, Cape Brett Rakaumangamanga, Clendon House, Māngungu Mission, Pompallier Mission, Ruapekapeka Pā and Te Waimate Mission. As part of the pilot these Landmark sites showcase unique, accessible stories, as well as having distinctive branding and signage to identify them as places not to miss.

In terms of land mass Northland is narrow, with close access to both east and west coasts, and also long if travelling in a north or south direction, such as travelling to the top of the North Island. From a transport perspective this can mean that visitors travelling to the top of the Far North can travel long distances (relative to other regions of New Zealand). It has the Twin Coast Discovery Highway, allowing travel up the east and west coasts, which can enable a loop of travel. However, fewer visitors explore the west coast, as many of the common attractions are found along the east coast (see section 3.3.4).

4.6 Data analysis

Data was analysed using SPSS 19 software, primarily using independent samples and repeated measure t-tests to identify statistically significant differences and correlations to examine the strength and significance of relationships.

[16] See this link to gain a better understanding of the activities, culture and heritage of the region: www.northlandnz.com/visit/about-northland

[17] www.landmarks.nz

5 Results

5.1 Visitor characteristics

An initial intercept sample of 229 visitors answered a series of recruitment and pre-travel questions relating to their prospective travel, budgets and plans around Northland. Subsequently, a smaller travel sample of 55 visitors (approximately 24% of the initial sample), or engaged pool of visitors from the initial sample continued to answer a more detailed range of questions during and post travel via the associated survey application (as per figure 4.1).[18] Within the travel sample, the control and intervention groups were split evenly. This travel sample also filled in daily travel surveys, including trip durations, destinations and associated satisfaction across a range of variables. Table 5.1 outlines these samples.

Table 5.1 Sample description and characteristics

Sample	N	Summary information and characteristics
Intercept sample	229	The initial sample of participants that were intercepted either at the airport or in Northland filled in all pre-travel questions, including information around the planned trip, their motivations and expectations. The sample was predominantly international visitors.
Travel sample	55	This group participated in using the application during their travel and also filled in the post-travel survey, including their revealed behaviour, level of satisfaction, likelihood to return, and likelihood to recommend to others. About half of this group received the information intervention. The sample was a mix of international and domestic visitors.
Travel days	116	A number of the travel sample group filled in daily travel surveys, including destinations, travel durations and ratings of the quality of the routes travelled (up to a maximum of 7 days of travel). This is the total number of travel diary days that were filled in by the travel sample group.

5.1.1 Origins and travel companions

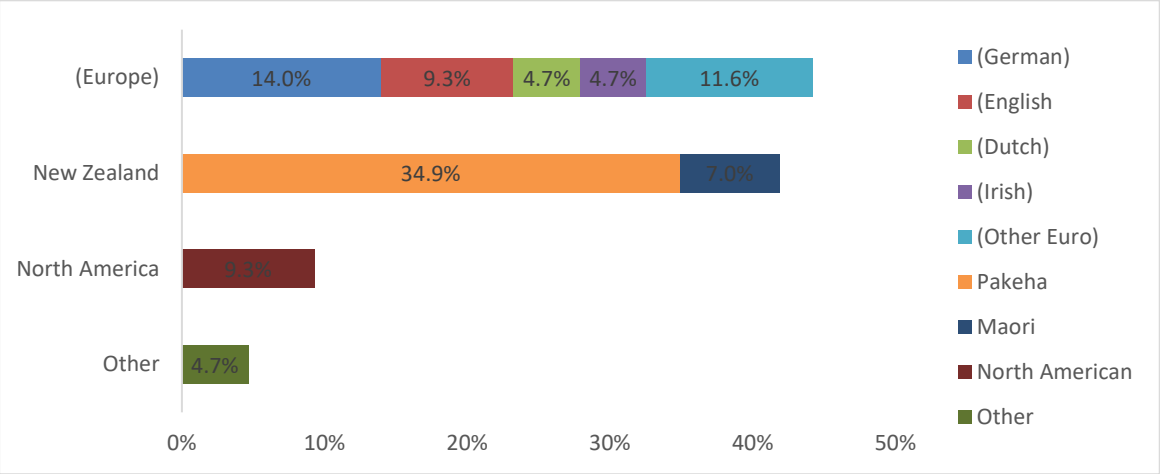
The intercept sample was composed predominantly of international tourists at 84.3%, with just 15.7% of domestic origin. This stands in contrast to the typical norm, where domestic tourists comprise the larger visitor group, for example, other data would suggest this is closer to 64% domestic (Harbrow 2016).[19] No respondents identified as either non-tourist or resident in Northland. About 20.3% of these visitors were travelling alone, 56.8% travelled with one other person and 23.0% travelled as part of a group.

[18] A cut-off score of 100 points on the survey application was used to exclude visitors who participated in the initial intercept sample, then answered some questions throughout the ongoing survey, but did so only minimally (ie they did not fill in a full travel day, or for those in the intervention group did not interact with enough of the information). Lower scores were deemed to indicate insufficient engagement and answers overall became sparse in the low score range.

[19] This may relate to the visitor recruiting location (see section 4.3.1), the time available to international visitors, or it being towards the end of the peak visitor season.

In contrast, the travel sample was more evenly split between international and domestic visitors, with 44.2% arriving from European countries, 41.9% New Zealand born, 9.3% from North America and 4.7% (other) from either Australia or South America (see figure 5.1).

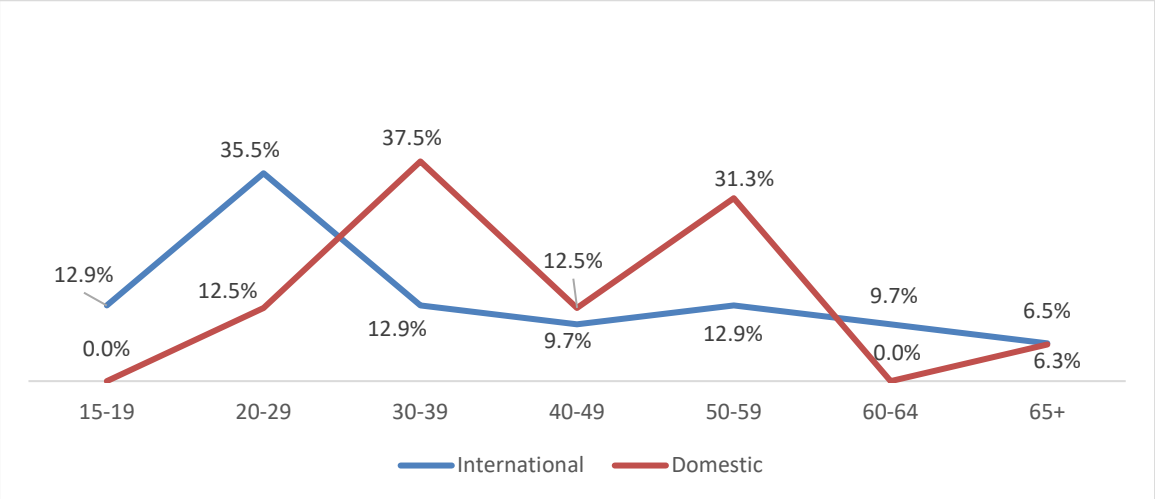
Figure 5.1 Travel sample visitor origins



5.1.2 Age and gender

Within the travel sample, a gender split was skewed toward females at 63%, while males accounted for 37%: N = 54. Overall, visitors ranged in age from 19 to 76 years: N = 51, M = 40.18, SD = 15.94. But international visitors indicated a unimodal peak in the 20–29 age range: M = 37.84, SD = 17.28, whereas domestic visitors showed a bimodal peak pattern at the 30–39 and 50–59 age ranges: M = 43.69, SD = 12.89; 37.5% and 31.3%, respectively, (see figure 5.2).

Figure 5.2 Travel sample age range



5.1.3 Planning, flexibility, and reason for visiting

Initially, visitors were asked about the time they spent planning their trip, and the flexibility of their travel plans. Only about a quarter of visitors had thoroughly planned their trip within New Zealand. Overall, time

spent planning tended to be low with 75.5% of participants stating they had spent 'none', 'very little' or only 'some' time planning for their visit: N = 173. That is, 1 in 4 were active planners.

Subsequently, visitors: N = 229 indicated high levels of flexibility in their travel plans; 72.9% as either 'somewhat', 'quite' or 'extremely' flexible: N = 167. Mean flexibility overall was 'somewhat flexible': M = 3.39, SD = 1.22.

Still at the intercept survey level, international and domestic visitors demonstrated different patterns of reasons for visiting Northland. Most international visitors (71%) were 'chance' and 'discovery' visitors (compared with 22.3% of domestic visitors; see figure 5.3). In contrast, most domestic visitors (63.9%) were 'destination' and 'loyalty' visitors (compared with just 28.5% of international visitors) (see figure 5.4). 13.8% of domestic visitors gave a non-descript 'other' reason for visiting, compared with 0.5% of international visitors.

Figure 5.3 Intercept sample reasons for visiting – chance/discovery

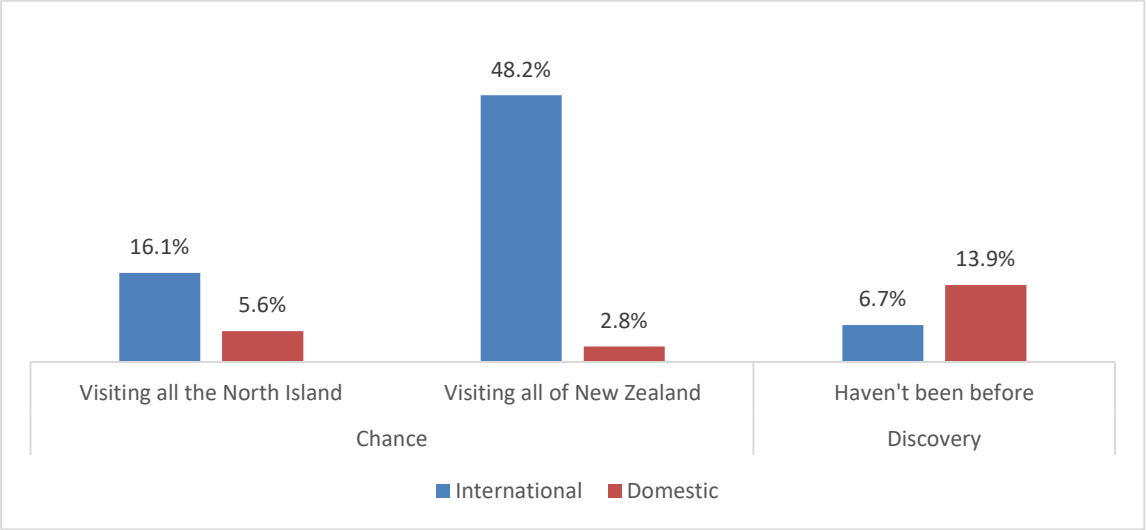
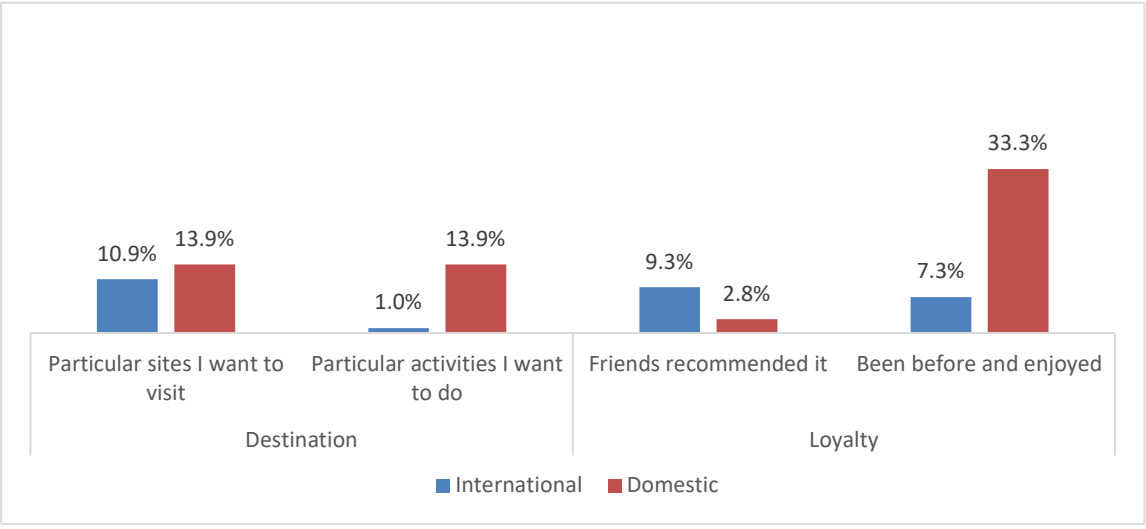


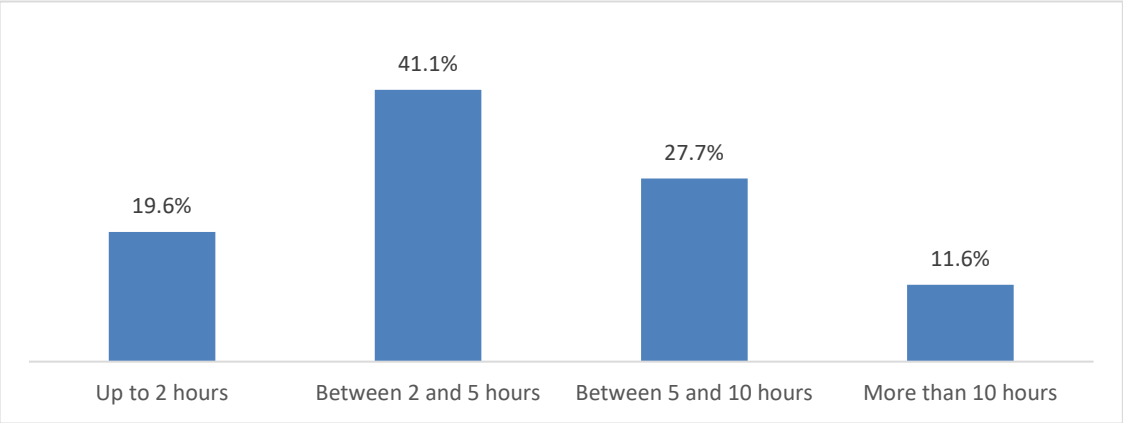
Figure 5.4 Intercept sample reasons for visiting – destination/ loyalty



5.1.4 Daily durations of travel

Visitors who engaged with the during-travel portion of the survey were sampled for up to a seven-day period and were asked to record how long each day's journey took, including stops. Daily travel lasting five hours or more each day (including stops) accounted for 39.3% of recorded trips, and 80.4% of daily trips were of two hours or more: N = 85 (see figure 5.5). There was no significant difference between international visitor and domestic visitor journey durations: t[83] = -.36, p = .721.

Figure 5.5 Daily durations of travel



The mean number of stops per day of travel for international visitors was 2.52: SD = 1.36, range = 1–7 and 1.89: SD = 1.17, range = 1–4 for domestic visitors. However, an independent samples t-test indicated there was no significant difference between groups: t[32] = 1.24, p = .225.

5.2 Pre and post-travel comparisons

5.2.1 Budget, per day, and number of people

Respondents were asked during the intercept sample to provide their planned budget. Subsequently the travel sample was also asked to report their post-travel, actual spend. Visitors reported a mean pre-travel budget of $1,214.16: SD = $1,822.24 and a daily planned budget mean of $163.87; this catered for a mean of 1.68 people: N = 134. Within the travel sample group of visitors, the mean pre-travel planned budget was $928.48 overall: N = 25, SD = $1,175.53, and the mean per-day spend was planned to be $137.96: N = 23, SD = $199.11. [20]

Subsequent post-travel responses showed no statistically significant difference between planned budgets and post-travel actual spend; participants may have adhered to budgets with limited flexibility to adjust spending. Overall, visitors reported their budgets catered predominantly for individuals (45%) or two travellers (47.1%).

[20] It was noted that these planned and actual budgets were low. Respondents may not have included pre-paid accommodation, flights, or vehicle rentals. So it is more appropriate to look at relative statistical comparisons and relationships (as opposed to looking at this raw data).

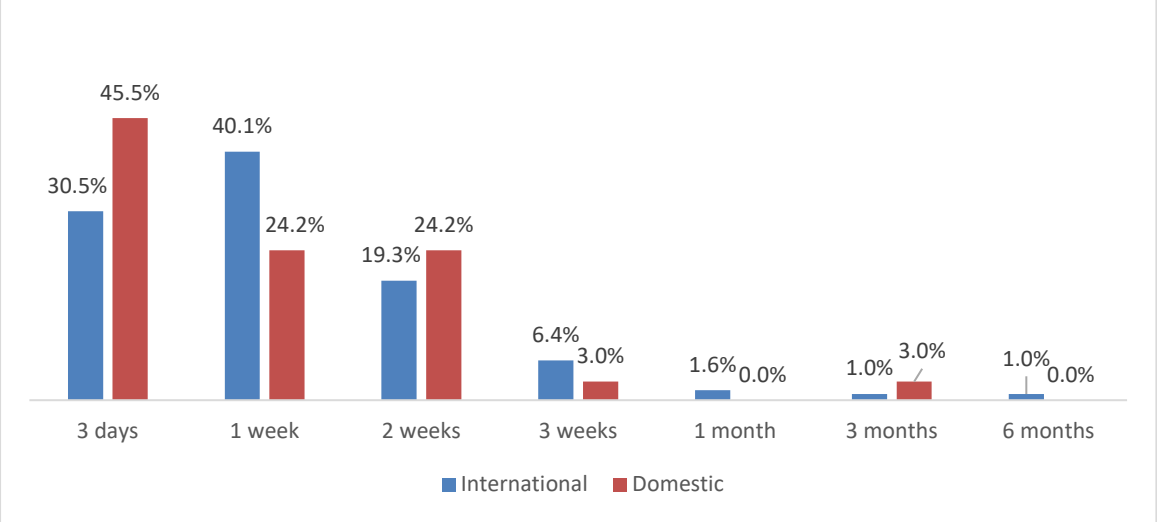
5.2.2 Length of stay in Northland

Planned durations of stay captured in the intercept sample were compared with the travel sample of visitors' actual durations of stay.

Overall, international visitors: N = 188 planned durations of stay within New Zealand ranged from 2 to 365 days: Mdn = 31, SD = 91.82. Within Northland international visitors planned stays ranged from 1 to 180 days: Mdn = 5, SD = 15.55. Domestic visitors: N = 29 planned similar lengths of stay in Northland: Mdn = 4, SD = 15.26.

Most visitors planned on staying up to one week in Northland (international = 70.6% and domestic = 69.7%), whereas most international visitors (85%) planned on staying up to three months in New Zealand (see figure 5.6). Within the travel sample, the engaged group of visitors: N = 48 gave a mean pre-travel intended duration of stay in Northland as 6.48 days: SD = 5.19.

Figure 5.6 Planned duration of stay in Northland



For the intervention group, the mean intended length of stay changed from 6.91 to 8.73 actual days: N = 22, but while there was an increase of 1.82 days this difference was not significant. Similarly, there was no significant difference between the control and intervention groups, nor between overall pre-travel intended durations of stay and post-travel actual durations of stay. This may be due to competing commitments on their time (eg another destination where they had bookings), as opposed to their desire to stay longer, one visitor commenting that they:

> *...loved the area, but didn't have enough time to discover more there.*

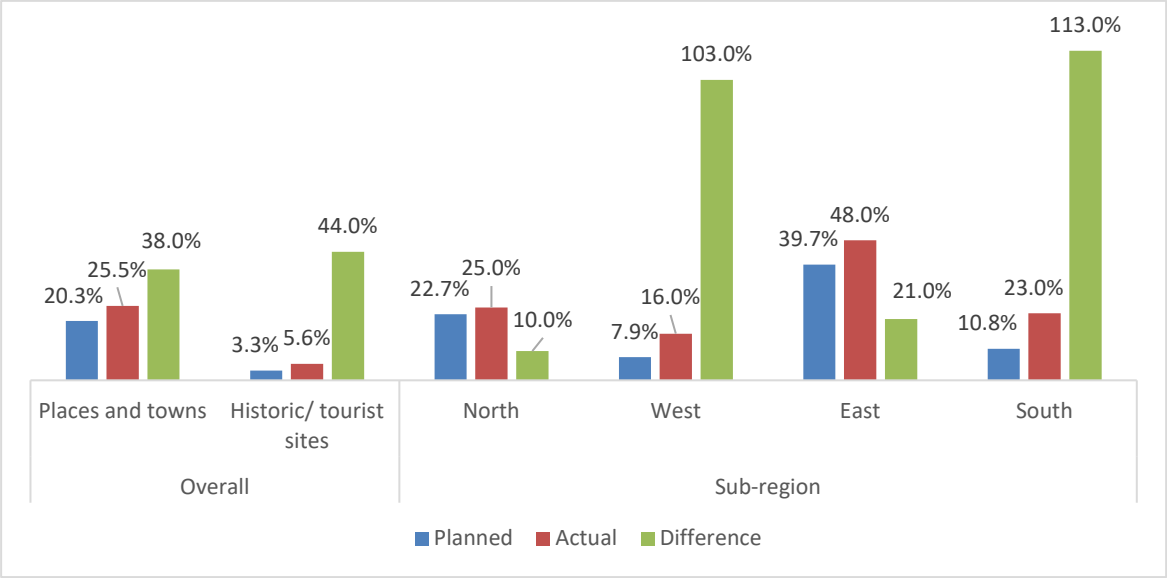
However, notwithstanding that lack of statistically significant change, 38.4% of visitors did increase their trip duration in Northland by between 1 and 39 days, and 4 out of 5 of those who stayed longer also spent more than their pre-planned budget.

5.2.3 Planned and actual destinations

Initially, visitors were asked to indicate which places and landmark sites they planned to visit or pass through, then in the final survey, which places and sites they actually visited. A benefit of measuring this information is that it can reveal which locations were discovered during the trip.

Drawing from the travel sample, international and domestic visitors' planned itineraries were compared with their actual destinations in Northland. The indicated locations were further subdivided into places and towns, historic/tourist sites, and into four sub-regions of Northland (north, west, east and south), as shown in figure 5.7.

Figure 5.7 Planned and actual destination, and difference scores



The general pattern was that visitors saw more places and sites than they had originally planned (see figure 5.7). Follow through on planned visits (both places and specific sites) was in the ratio of 4:5 for international visitors and 7:8 for domestic visitors. However, 66.7% of international visitors said they were 'not sure' what places and sites they would visit (compared with 42.9% of domestic visitors who were unsure).

Furthermore, figure 5.7 shows the difference increase between original plans and subsequent visits. Notably, the increase for both places and towns and historic/tourist sites is very similar, notwithstanding the low number of sites included in the survey. The greater subsequent patronage of places and sites in the west and south is substantially higher than initial plans, whereas subsequent patronage of places in the north is still greater, but relatively far smaller than for other areas.

The top three places most featured on international visitors' itineraries were, in order, Paihia, Ninety Mile Beach and Cape Reinga, whereas the top three for domestic visitors' places were Paihia, Kerikeri and Kaitaia.[21] Featured on 26.2% and 38.1% of international and domestic visitors' planned itineraries respectively, Waitangi Treaty Grounds were the most featured site – the mean overall for planned visits to sites by both international and domestic visitors, excluding the Waitangi Treaty grounds, was only 3.3%. However, only nine specific sites were included in the survey.

Visitors' actual travel to Ninety Mile Beach and Cape Reinga/Te Rerenga Wairua was lower than planned (see figure 5.8), meanwhile travel to places in the west and the south was markedly higher than planned (see figure 5.9).

[21] Because the initial surveys were predominantly collected in Whangarei, this place was omitted from the list, as the site would be biased.

Figure 5.8 Destinations – places, east and north

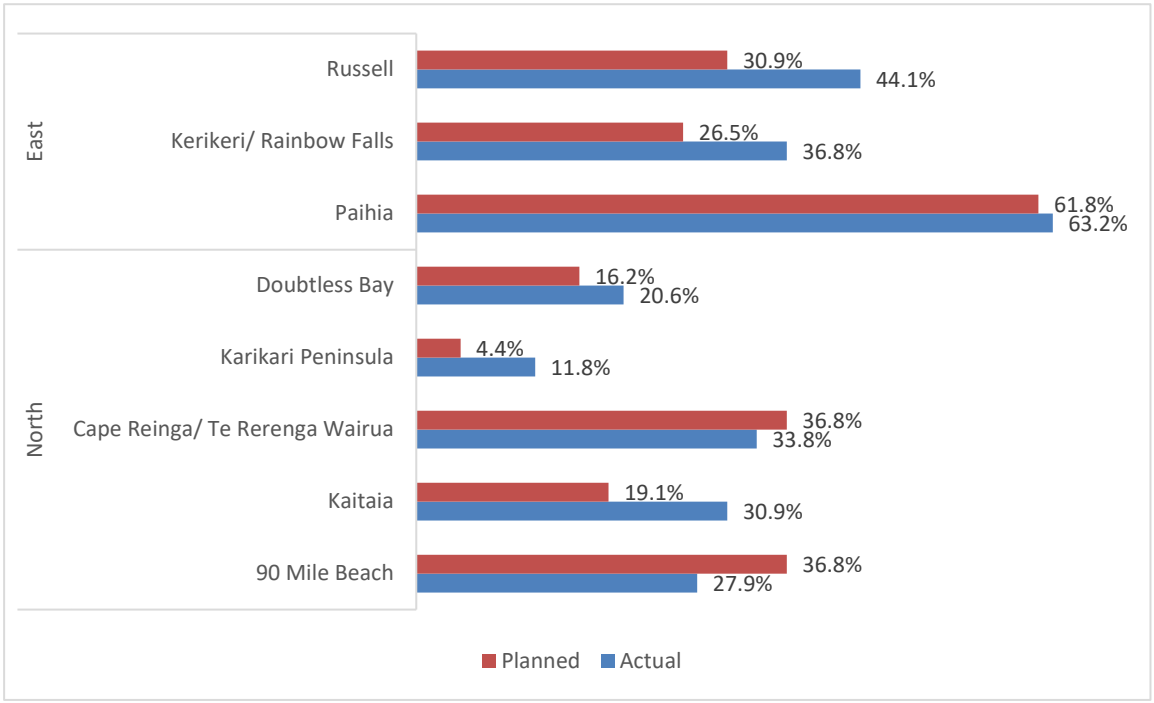
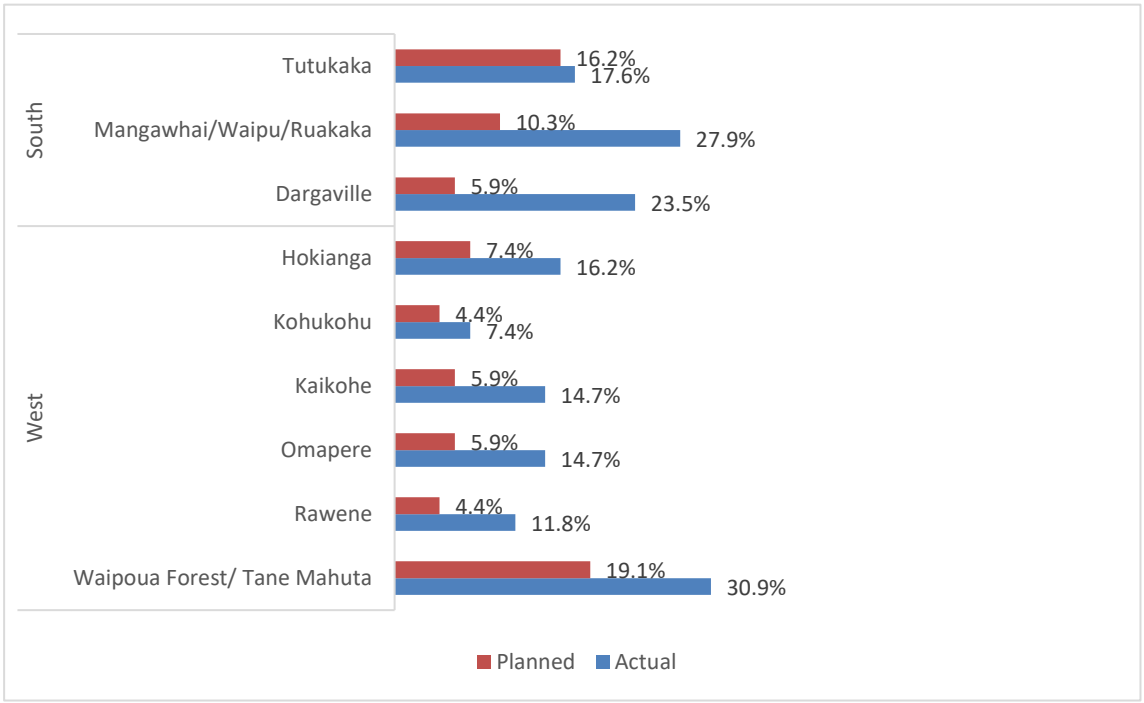


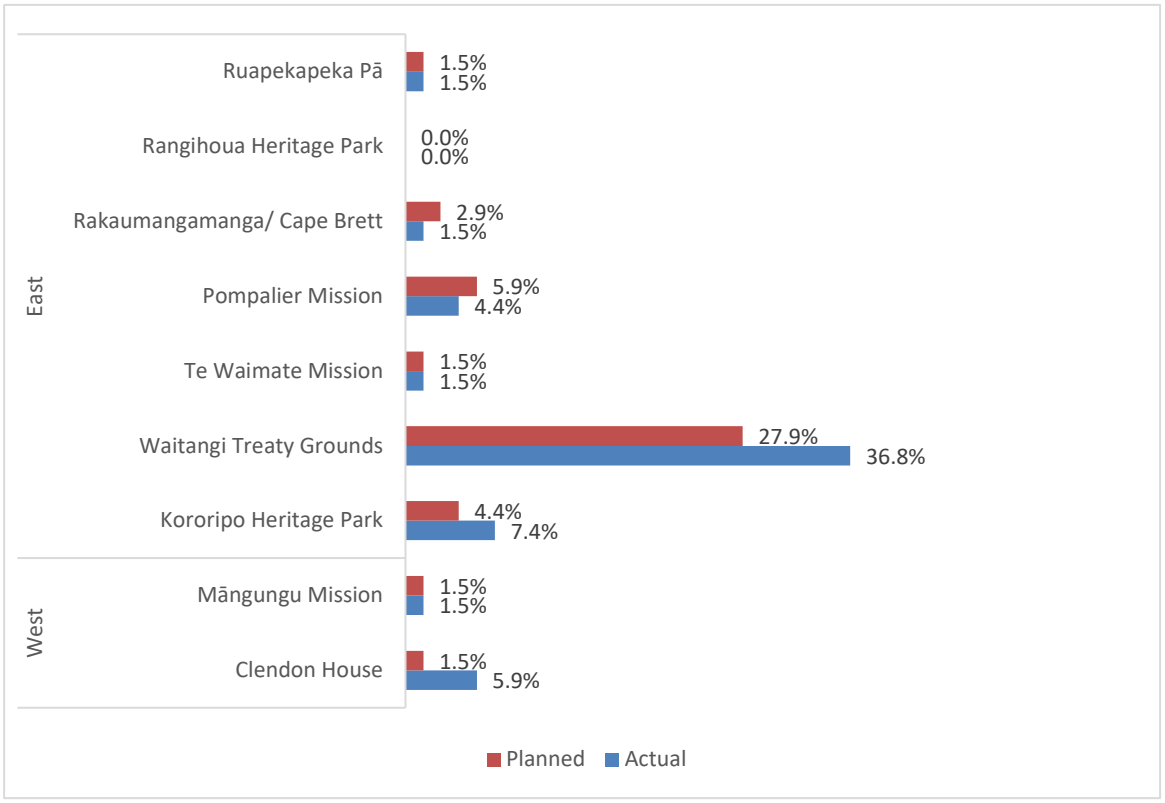
Figure 5.9 Destinations – places, south and west



5.2.4 Landmark and heritage site insights

Excepting planned patronage of the Waitangi Treaty Grounds, there were few planned visits to specific historic and tourist sites in Northland (see figure 5.10). The mean of planned visits by international visitors was only 2.7% versus 5.4% for domestic visitors. From this we could infer that an international visitor's knowledge of specific sites was more limited than that of a domestic visitor. None of the survey historic/tourist sites were located in the northern or southern sub-regions of Northland.

Figure 5.10 Destinations – historic/tourist sites



Visitors' written responses indicated that where plans were made, motivations, such as a desire to experience New Zealand history and culture, Northland's natural beauty, and to find photo opportunities were salient. Examples include those of visitors who were interested in the founding of Paihia, or the historical events around the Waitangi Treaty Grounds. In one case a visitor was travelling to the Ruapekapeka Pā to better understand their family history. Perception of excessive cost and a lack of knowledge were the most common reasons given for not visiting specific sites.

In an open-ended question, people were asked why they visited these locations. Those who responded indicated that travel-guides, recommendations by prior visitors, and in one instance 'the internet and sheer luck', as reasons for why particular sites were included on their itineraries.

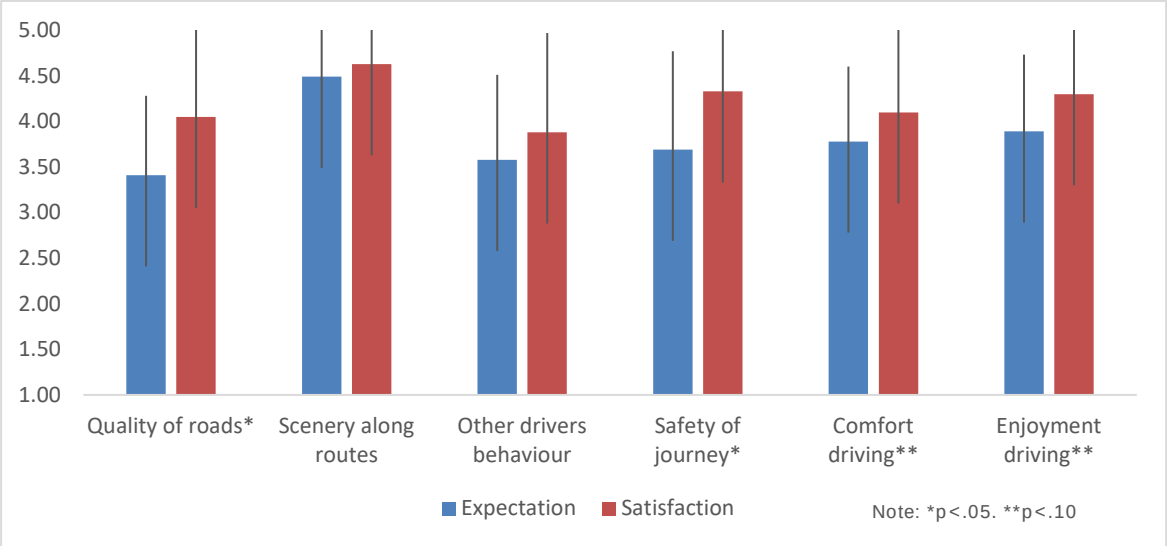
Visitors were also asked to consider their experiences at these sites, and then subsequently to rate how likely they were to visit other historic and cultural sites in Northland on a 5-point Likert scale. About 60% of these visitors gave a positive response, with 32.7% stating that it was very likely they would visit other sites, whereas 21.8% answered in the negative and 18.2% were neutral ('neither likely, nor unlikely').

5.2.5 Expectations vs satisfaction

5.2.5.1 Travel characteristics

Perceptions of the quality of roads, safety of journeys, comfort driving and enjoyment driving all saw significant increases over base expectation. Difference scores respectively were 0.64, 1.18, 1.15 and 1.09. Furthermore, the satisfaction scores for all four of these items were at least 'somewhat satisfied': M = 4.05, 4.33, 4.1, and 4.30 respectively. Notably, there was no significant difference between pre- and post-travel results for scenery; expectations were already high, and this expectation can be said to have been met (see figure 5.11).

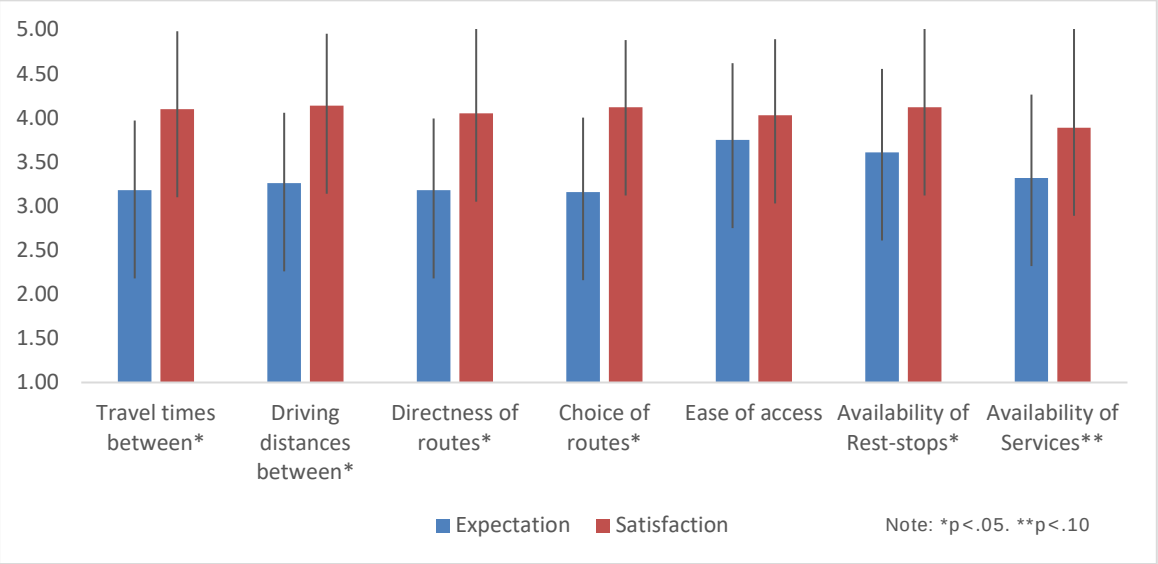
Figure 5.11 Travel characteristics of the route



5.2.5.2 Travel facilities and accessibility

Pre-travel expectations with regards to travel facilities tended to be 'moderate', but in the cases of travel-times between locations and driving distances between key locations, directness and choice of routes, and the availability of rest-stops and services, there were significant inclinations. Difference scores were, respectively, 0.92, 0.88, 0.87, 0.96, 0.51 and 0.57. Mean satisfaction in all cases exceeded 'somewhat satisfied', except for the availability of services where the satisfaction was M = 3.89 (see figure 5.12). Indeed, some visitors, via written comments, raised concern at a lack of facilities in general for self-contained vehicles, such as shower facilities at leisure centres, or as part of 'freedom camping' spots.

Figure 5.12 Travel facilities and accessibility



5.2.5.3 Travel information

Visitors were asked about the expectations and subsequent satisfaction with the timeliness and accuracy of information about travel choices (see figure 5.13). There was a significant difference between expectation and subsequent satisfaction (difference score .47, M = 4.02 'somewhat satisfied'). There was no significant difference with regard to the accuracy of information about travel choices, where expectations were 'moderate' and visitors were 'somewhat satisfied'.

Written responses by visitors included recommendations for more signage, but also that the existing signage was difficult to see, as were the entrances to key locations. For example, the signage leading into Doubtless Bay was 'difficult to see', and the Marsden 'cross walkway is very small and easy to miss'. Other visitors had some difficulty navigating, becoming lost a few times due to having difficulty with Māori place names ('mistaken [sic] names for others').

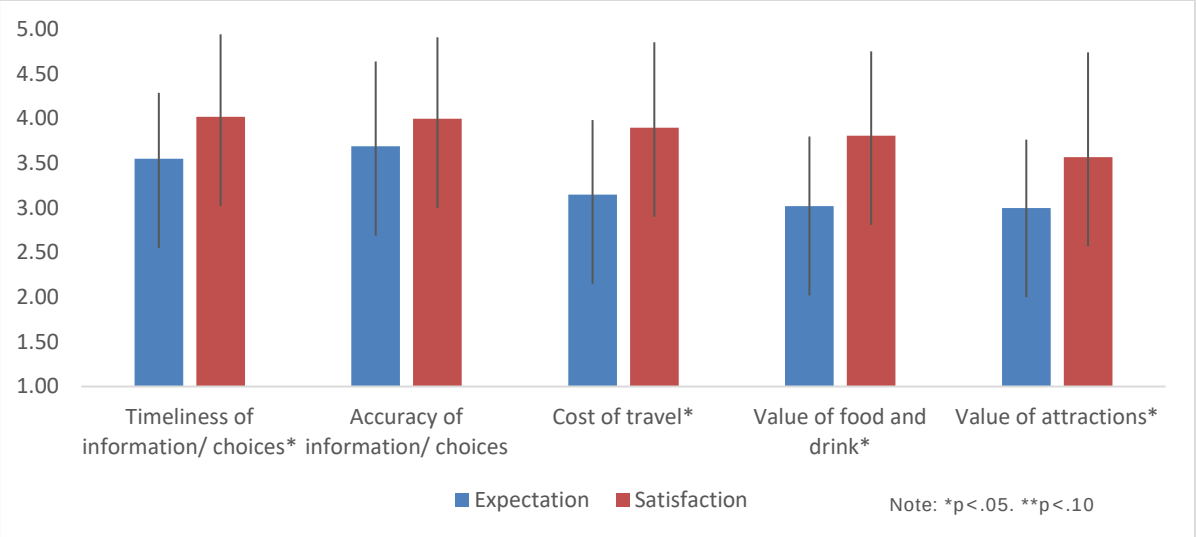
> *a little more signage [in general] would be helpful, especially with travel-times instead of km.*

There was also a request to improve walking track maps and their availability at information points. The information centre in Kaitaia was praised ('a great complex with cinema, library, i-Site all under one roof. The kids enjoyed reading all the information about Māori culture and lifestyles and history... Welcoming place').

5.2.5.4 Travel cost and value

Pre-travel expectations with regards to the cost of travel, and value for money in relation to food and drink, and attractions and activities were moderate. In all three cases there were significant differences between expectations and post-travel satisfaction (differences scores, respectively, were 0.75, 0.79 and 0.57), indicating a positive level of satisfaction (see figure 5.13. However, the satisfaction results around cost and value did have mean scores below four (indicating a result above neutral but below 'somewhat satisfied': M = 3.9, 3.87 and 3.57, respectively).

Figure 5.13 Travel information and travel-cost and value



5.2.6 Overall satisfaction, and recommendation and revisiting intentions

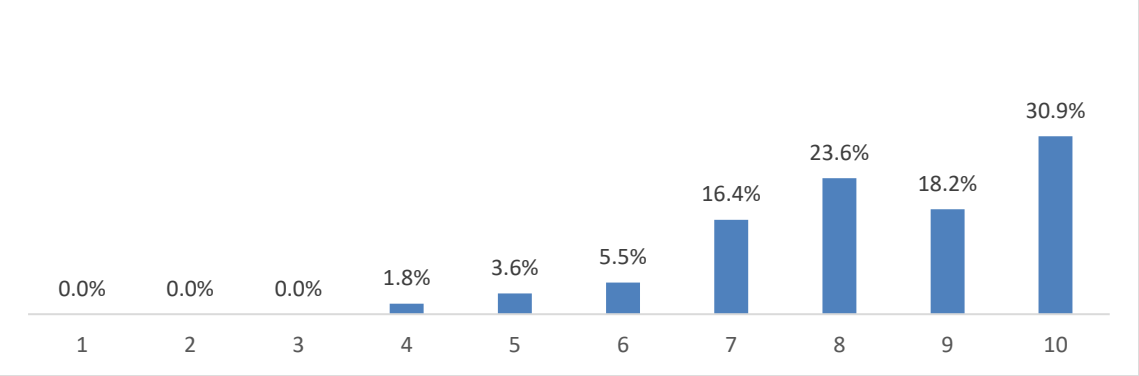
Visitors in the travel sample were prompted to rate their overall satisfaction with their Northland visit, places and experiences on a 10-point Likert scale ('extremely dissatisfied' to 'extremely satisfied'). The means for responses on all three items fell between 8 and 9: N = 55, M = 8.35, SD = 1.53 for overall satisfaction; M = 8.53, SD = 1.14 for satisfaction with places in Northland; M = 8.22, SD = 1.36 for satisfaction with experiences in Northland (see figure 5.14).

When asked to rate satisfaction with their visit to Northland, 30.9% rated this at a 10 ('extremely satisfied') and 89.1% rated it between 7 and 10. Written responses also tended to be positive, for example one visitor stating it was:

> *So beautiful, with friendly people and a great atmosphere. [Northland is] probably my favourite area of the North Island.*

However, some concern at the 'depressed' appearance of Kaikohe and Kawakawa, was given in written responses. Only 1.8% of visitors rated satisfaction with their Northland visit at lower than 5.

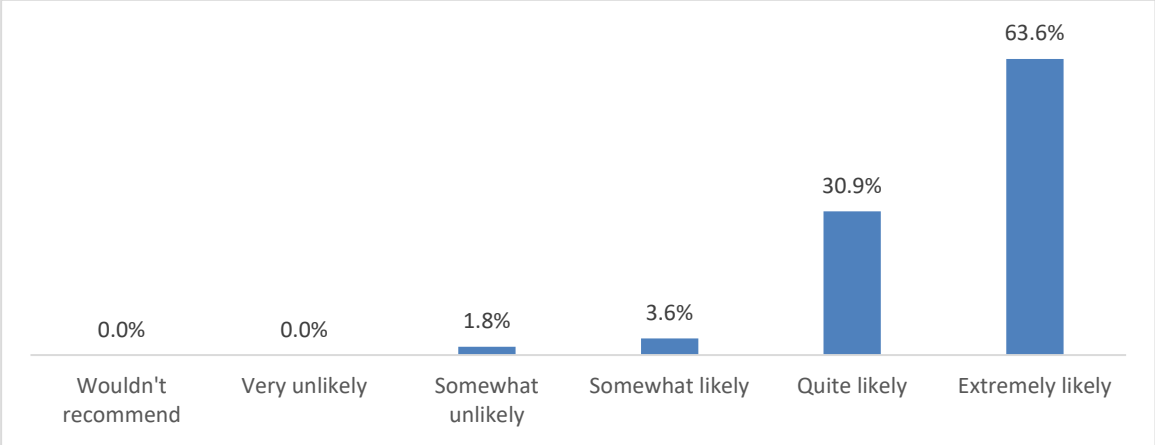
Figure 5.14 Overall satisfaction



Subsequent likelihood of recommending Northland for tourism/holiday, and how likely visitors judged they would revisit Northland on their next trip to New Zealand were reported on 6-point Likert scales.

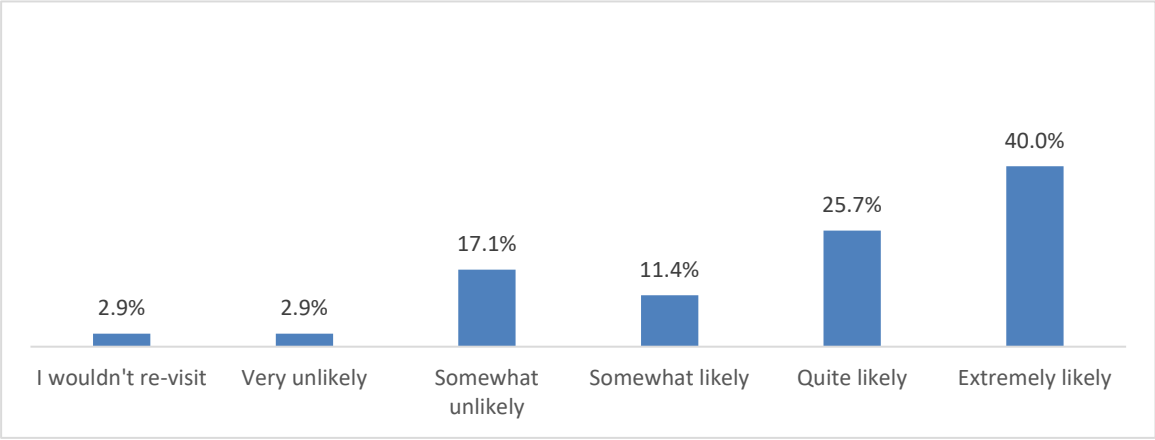
Positive recommendations were high, with 63.6% of travel survey visitors stating it was 'extremely likely' they would recommend Northland to others, and 98.1% overall responded positively (see figure 5.15). No visitors indicated either 'very unlikely' or 'wouldn't': N = 55, M = 5.56, SD = 0.66. The net promoter score calculated from overall satisfaction was 41 (50% promoters, 40.74% neutrals and 9.26% detractors).

Figure 5.15 Likelihood of recommending Northland to others



Intentions to revisit Northland in the future were also high. Forty percent of travel survey visitors rated their likelihood of revisiting Northland on a return to New Zealand as 'extremely likely' and 77.1% overall responded positively (see figure 5.16). Only 1.8% said they 'wouldn't revisit': N = 35, M = 4.74, SD = 1.37.

Figure 5.16 Likelihood of revisiting Northland



5.2.7 Regional exploration and visitor satisfaction

During the visit those in the travel sample were asked to record their start location and destination for each day of travel. At the same time they were asked to rate their satisfaction with the various travel characteristics of that journey – using the same categories as those in section 5.2.5 (travel characteristics, facilities, travel-cost, value and information).

Subsequently, Northland was divided into four sub-regions to examine journey satisfaction with different parts of Northland at a slightly smaller scale (north, east, west and south; see figures 5.18 and 5.19). These were the same four delineations used to examine planned and actual destinations (in figure 5.7). Visitors' satisfaction scores were then compared amongst those whose trip was within the east of Northland (east-only), or which included a northbound or westbound journey. In terms of the method, this enables us to test whether improved geographical granularity adds valuable insights, for example to identify locations to promote more strongly, or to highlight more targeted investment opportunities in specific locations (see also section 6.2).

In all categories westbound travel received the highest satisfaction ratings, including for overall satisfaction: M = 4.71, SD = .49 (see figure 5.17). Northbound travel was next most satisfied overall: M = 4.46, SD = .78, whereas travel confined to the east had the lowest overall satisfaction: M = 4.25, SD = .82. Northbound travel saw the lowest satisfaction scores for 'travel cost and value', and 'travel information' (composed of the cost of travel, value of food and drink, the value of attractions, and the timeliness and accuracy of travel information choices: M = 2.92, SD = 1.34; M = 3.54, SD = .75), respectively. Travel in this direction also saw the lowest satisfaction scores regarding the availability of travel facilities (ie of rest-stops and services: M = 3.69, SD = .92).

Westbound travel satisfaction in the 'travel characteristics' category was driven by high satisfaction ratings of other drivers' behaviour, and respondents reported satisfaction with the 'safety of the journey': M = 4.43, SD = .79 and M = 4.57, SD = .79, respectively. In contrast, east-only travel saw the lowest ratings of other drivers' behaviour: M = 3.63, SD = 1.03 and scores for 'safety of the journey' were lowest in northbound travel: M = 3.85, SD = .90.

Figure 5.17 Satisfaction and direction of travel

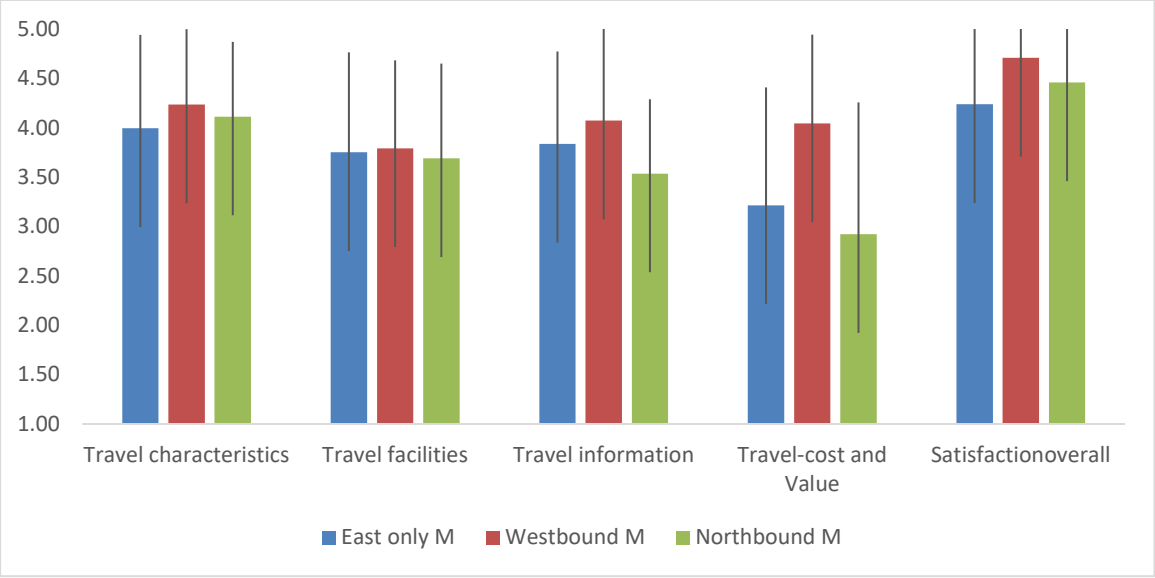
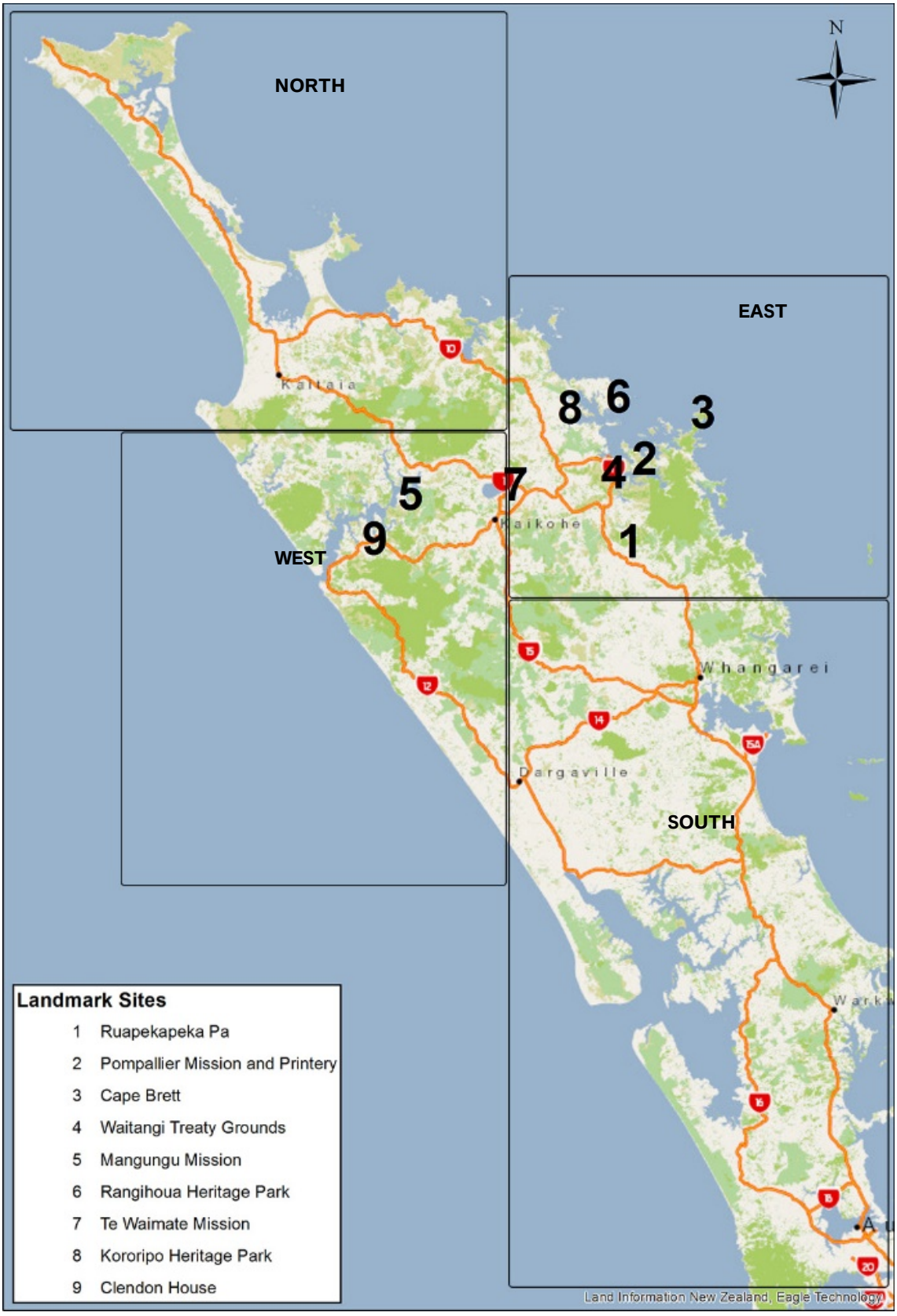


Figure 5.18 Directions of travel and subsequent satisfaction – destination towns and places (Basemap credit: Land Information New Zealand and Eagle Technology Ltd)

Figure 5.19 Directions of travel and subsequent satisfaction – destination landmark sites (Basemap credit: Land Information New Zealand and Eagle Technology Ltd)



5.3 Influential factors to visitor experiences

Analyses of correlation (Pearson's r) were run in order to determine whether any relationships, and what strength of those, existed between characteristics of the Northland travel experience and subsequent success metrics. All the individual aspects of travel characteristics, travel facilities, travel information, activities, and places and historic sites based in Northland were compared with three success metrics. These were 1) a visitor's intention to revisit, 2) intention to recommend Northland to others, and 3) their overall satisfaction. Where significant correlations were found, these were then ranked from strongest to least influential, and tabled to show where particular characteristics appeared on one or more of the success metrics (see tables 5.2 and 5.3; characteristics are marked with an x against the metric with which they showed a significant correlation, and where characteristics showed multiple correlations the strongest has been reported in the table).

In terms of travel characteristics, facilities and information, while availability of services and rest stops and amenities saw the strongest correlations overall (specifically in relation to the 'overall satisfaction' success metric). Overall, quality of road-side scenery saw moderate strength correlation across all three success metrics. Multiple road-related characteristics (eg driving distances between locations, quality of roads and directness of driving routes) showed at mostly moderate strength correlation with positive success metric scores. One participant summarised this very succinctly:

> *Love the North, roads getting better, scenery and countryside the best.*

Table 5.2 Top-8 most influential elements of travel characteristics, facilities and information

Rank	Item	r	Revisit	Recommend	Satisfaction
1	Availability of services (petrol, repair, garages)	0.67	x		
2	Availability of rest stops and amenities	0.51	x		
3	Quality of road-side scenery	0.47	x	x	x
4	Comfort driving	0.41	x		x
5	Driving distances between locations	0.41	x		x
6	Driving enjoyment	0.39	x		x
7	Quality of roads	0.32			x
8	Directness of driving routes	0.29			x
Note: r = strength of relationship; small = .10; moderate = .30; strong = .50					

In terms of motivational factors, visitors answered a series of questions predicated by 'during this visit I...' For example, those visitors who answered 'during this visit I... felt relaxed' showed the strongest (moderate) correlation with overall satisfaction. Feeling safe and secure during the visit also had a moderate relationship, indicating it as a minimum factor around choosing to revisit Northland or recommend it to others. Finally, meeting social needs like meeting new people and being social, and cultural needs like experiencing different lifestyles and experiencing Māori culture, were also influential.

Table 5.3 Top 8 most influential motivations

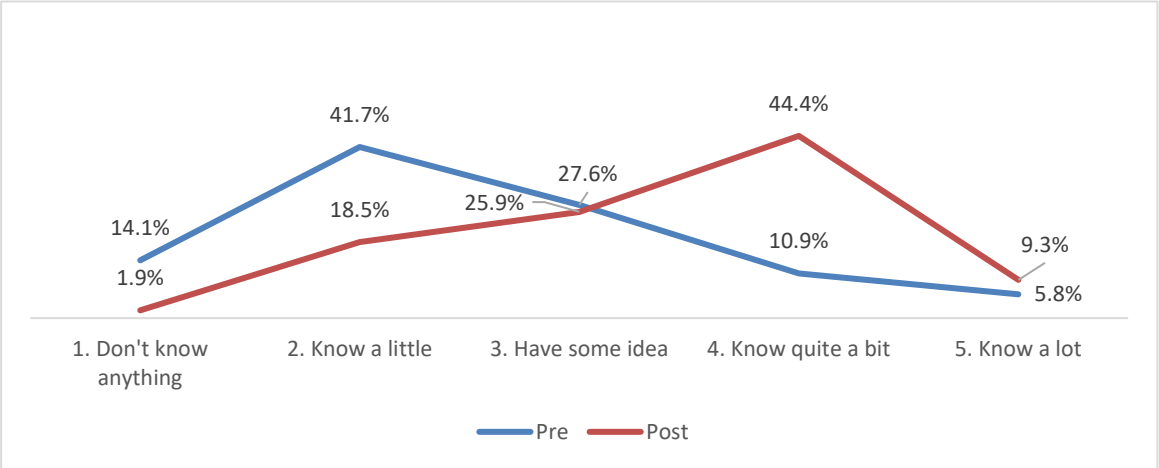
Rank	Item	r	Revisit	Recommend	Satisfaction
1	I felt relaxed	0.47			x
2	I visited beaches	0.42			x
3	I experienced different lifestyles	0.41	x		
4	I met new people	0.38		x	
5	I was physically active	0.37		x	
6	I was social	0.37			x
7	I felt safe and secure	0.36	x	x	
8	I experienced Māori culture	0.36		x	
Note: r = strength of relationship; small = .10; moderate = .30; strong = .50					

5.4 Intervention effect

5.4.1 Knowledge of Northland

Visitors ranked their initial knowledge of Northland on a 5-point Likert scale. Results ranged between 'I know a little about Northland' and 'have some idea of what Northland will be like' (tending toward the latter: N = 156, M = 2.63, SD = 1.01. Of these, 55.8% of visitors fell in the 'I don't know...' and 'I know a little...' range, 27.6% had 'some idea of what Northland will be like', and 16.7% reported knowing either 'quite a bit' or 'a lot' about Northland (see figure 5.20).

Figure 5.20 Knowledge of Northland



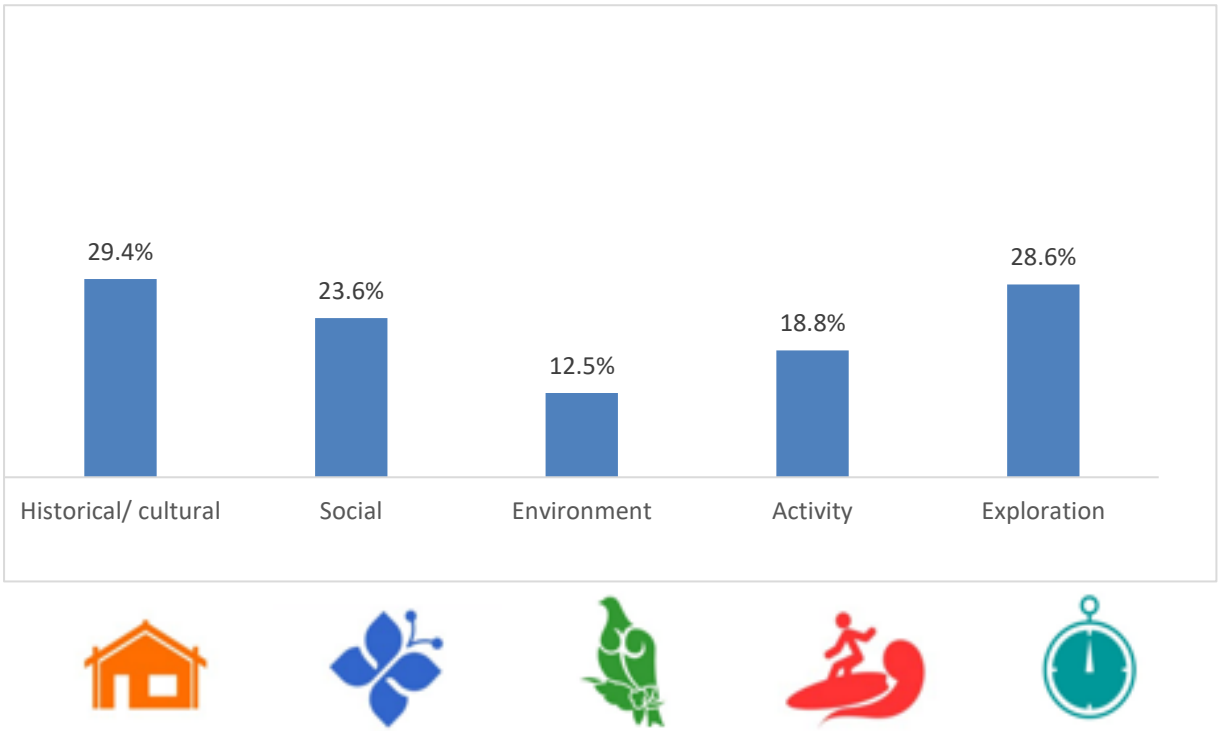
Subsequently, knowledge of Northland in the travel sample significantly improved from M = 2.63 to M = 3.25 (t[32] = -3.62, p = .001). Indeed, both control and intervention groups demonstrated significant improvements as indicated by a paired samples t-test (t[17] = -2.37, p = .030, and t[13] = -4.770, p < .001, respectively). However, an independent samples t-test indicated there was no significant difference between the control and intervention groups overall (t[52] = 1.35, p = .874). This intervention group showed the largest mean difference score of +1.00 (versus +0.61 for the control group), but this difference was due to a lower starting point for knowledge.

5.4.2 Usability and enjoyment

Intervention group participants were asked to rate the level of helpfulness of the information provided by the intervention application, and 'how much did you enjoy the following games and information' on a 5-point Likert scale. 'Helpfulness' was rated at a mean of 3.59 (N = 22, SD = 1.33), with about 22% of visitors gave positive 'quite' and 'very' responses, and 36.4% rating it as 'somewhat' helpful.

To the second question (see figure 5.21), users preferred interacting with the historical/cultural, and exploration-related information and challenges (29.4% and 28.6% positive ratings, respectively), with 23.6% giving a positive rating for the social/people information and events. Environment-related information was least preferred.

Figure 5.21 Preferred information types



6 Discussion

6.1 During trip information intervention, gamification and visitor growth

6.1.1 Information intervention

A key purpose of this study was to understand how visitor behaviour might change during a trip if targeted information were delivered, in a fun, interactive way. It was expected that this would encourage visitors to experience a wider set of locations and activities, and following on from this to spend more, stay longer, and generally have greater satisfaction with the region.

Overall, those in the intervention group for this pilot study did not significantly alter their immediate visitor behaviour, or significantly influence satisfaction, likelihood to return, or recommend Northland to others. However, it is important to state this does not mean this type of intervention would not be successful in future. While the during-trip information was valued by participants, there are a few challenges to overcome for this type of intervention. Altering behaviour in a short-term trial is ambitious, especially doing this via an information intervention when visitors are already receiving a lot of additional information, where there may be external constraints (eg other destination-based bookings), and doing this across an entire region (as opposed to a more localised intervention). Additionally, delivering this information via a new application that the user has not engaged with previously, and expecting visitors to adopt this application over the duration of their Northland trip increases the effort required by new users.

Despite these challenges, there is an opportunity to provide better during-trip information. This study has revealed the value of improved during-trip information to help access key sites (eg Clendon House), and has also revealed information gaps based on the particular activities on offer (especially for international visitors). For this Northland case study, knowledge was very low initially (only about 18% knew quite a bit or a lot), but increased significantly after the trip. Knowledge is important as it has been linked to wider exploration of an area (eg Shoval and Raveh 2004). In many cases it seems there is an information gap for visitors, with one international visitor stating they found themselves in Northland because of 'the internet and sheer luck'. Finally, this study has revealed an improved understanding of the type of information that aligns with the underlying motivations of visitors, with the strongest desire for exploration-based and cultural information.

6.1.2 During trip information and improved experiences

There is still limited information and large opportunities relating to the delivery of information to visitors during a trip (Thiel 2014). Many of the traditional barriers to success will become less relevant over time, including limited internet access, where existing programmes, like the Mobile Black Spot Fund (MBIE 2017b), will improve internet access and reliability on state highways and at targeted visitor destinations in New Zealand. Similarly, some barriers can be mitigated for the visitor population, including health and safety for drivers using in-vehicle mobile phone applications. For example, by checking the user is a passenger (it is common for visiting drivers to travel with passengers); allowing solo drivers to look at their mobile device at a point where they are stationary (based on the GPS from the device); or using non-visual delivery modes, including audio (eg Juhlin 2010).

Other relevant factors are how to send targeted information at key decision points, what data types to focus on, and how to build trust and engagement with information sources (when there are multiple applications and information sources). Consistent branding and icon use that matches official physical

signage not only has familiarity but delivers a sense of permanence, so the online presence is anchored to trusted, official, real-world information. Encouraging developers to leverage off this benefit would enable cost-effective promotion of official content and key messages, but is also likely to improve brand recognition for official content. For example, branding around highways or landmarks can be improved via eWOM (electronic word of mouth) using existing social media channels. This has the benefit of the high level of trust associated with word of mouth (eg del Bosque et al 2009), and also enables visitor comments to have a wider and lasting presence due to the online medium.

While outside the scope of this pilot study, being able to provide targeted information that is location specific is very desirable to visitors. Packaging destination information based on route selection enables location-based triggers to push information based on GPS in advance of an upcoming choice of route. This would allow users to make informed trade-offs based on a simple, user-selected information layer, such as those of particular value to visitors, like a culture and heritage rating or an 'explorability' rating for different routes. It would also allow users to engage in a more in-depth layer of information underpinning the rating, and understanding more detailed motivations that can be met by a particular route. Once information becomes narrower based on location it offers an opportunity to deliver it in a higher effort format, which is more desirable to users. For example, Juhlin (2010) used *Road talk* to explore offering an audio sound bite or story to drivers that linked to specific roadside locations. This was preferred over text-based information and minimised visual distraction.

6.1.3 Intervention approach, gamification and measuring success

Interventions to improve information transfer for visitors typically only test the visitors' perceived satisfaction with the information, or the usability of the application, as opposed to how the information may influence behaviour. This is particularly the case for the multitude of new applications being developed that deliver visitor information about destinations and even visitor routes, for example Route 66 (Thiel 2014). A few studies that have focused on behaviour change via gamification have also typically taken place in simple, localised settings, where the behaviour was relatively low effort. For example, Lim et al (2016) trialled a phone application in a very localised zoo setting and rewarded visitors for exploring more of the zoo. However, they only measured success in usability and satisfaction, and did not have a control group to measure behaviour change in terms of duration spent, distance travelled, or locations visited (compared with people who had not received the information and reward).

An innovation and challenge taken on within this study was to look at differences in behaviour between an intervention group and a control group to move beyond satisfaction and into outcomes. The visitor experience evaluation framework and method developed within this study is applicable to other visitor interventions, and enables better quantification of any investment (see section 4.2). Similarly, the gamification methods used are based on best practice psychological theory. Several lessons around how to reduce the complexity of this tool, how to improve participant engagement (especially when there is a control group that does not receive a lot of the 'fun' elements), and how to overcome some of the issues around the use of applications like this are outlined briefly in appendix A.

6.2 Visitor flexibility and desire for exploration

Overall, there is a perception in most visitors (73%) that they are flexible in their journey plans, which is backed up by the fact that three in every four visitors stated they did not actively plan out their trip (see

section 5.1.3).[22] This is further supported by visitors' revealed behaviour, where they discovered different parts of the region and more locations than originally intended. Lastly, those who explored further, in the case of Northland this included travelling to the West Coast or travelling further north towards the top of the North Island, were found to have greater satisfaction with their visit. These findings support key strategy and initiatives of tourism and heritage agencies in New Zealand to work with transport agencies to better unlock regional dispersal. In terms of the success of the methodology it also identifies (or reinforces) the growth potential of the Northland region, and consequently the location and type of investment opportunities (eg around infrastructure improvements and promotion) that would be most successful.

Relevant factors relating to wider spatial movement by visitors include infrastructure capacity of a region, duration of stay and experience with the area, which could equate to being better informed (Fennell 1996; Shoval and Raveh 2004). Brown and Chalmers (2003) indicate that visitors do target destinations, but also value flexibility if their preferred option is crowded or does not align with what they had expected. Overall, visitors desire spontaneity. Thiel (2014) recommends that systems should work with and encourage the 'wandering' behaviour of visitors, indicating that this feeling of serendipitous discovery is a highly valued visitor experience. While the sample of international visitors (who did tend to explore further) also had an over-representation of younger age groups, other studies suggest that discovery is something older visitors also desire (Jönsson and Devonish 2008), indicating these findings may be relevant to a wide group of visitors.

Catering to this type of visitor could increase visitor dispersion and consequent economic dispersion and relate to a better visitor experience. Sharing the travel routes and destinations that have lower demand but are favoured by 'explorers' would also be an added layer of information that could support visitor dispersion in a region (for example, consider a customer-informed 'discovery' star rating or equivalent as part of roadside information or as part of an online interactive map of a region).

6.2.1 A novel 'discovery' metric

It is critical to improve information about pre-trip intention to travel to a destination and a lot of work has already been done on delivering effective content using multiple communication channels. However, there is still limited knowledge around the intention to visit a specific destination and the actual visit to that destination. There were many sites that people only seemed to discover once they had travelled around the area (see section 5.2.3). In other fields, closing the gap between intended behaviour and actual behaviour is desirable (eg people intend to eat better and exercise more, but this is often influenced by habit and effort). However, in this case the actual behaviour is underestimated.

The survey reveals there were several locations that people actually travelled to during their trip even though they had stated they did not intend to travel to these locations. An explanation for this could be a lack of familiarity or knowledge of the exact names of places, resulting in an under-representation of intended behaviour. Or it could be the visitor discovered new locations through new information received during the trip or by chance on their way to visit somewhere already planned.

Based on the other findings around low trip planning, low knowledge of places to visit and a desire for exploration, it appears reasonable to suggest that a lot of this relates to a 'discovery' factor, so certain locations are more likely to be discovered and visited than others. Understanding which sites are more

[22] These findings for planning, flexibility and discovery relate to the initial *intercept sample* that is mostly made up of and most applicable to international visitors. However, the *travel sample* was made up of a relatively even mix of domestic and international and still revealed discovery behaviours.

likely to be discovered than if they were part of a planned visit reveals key elements around the desirability, accessibility and information available for different attractions. This unique measure can be used for each site and region by calculating the relative percentage increase in actual versus expected visits (ie examining the frequency of actual visits divided by the frequency of intended visits).

Another theory around discovery is that of 'discovery trade-offs', where visitors may take opportunities earlier in their trip to meet a specific motivation, which means they do not always travel to all of their intended destinations. For example, the Far North region of Northland, with key attractions such as Ninety Mile Beach had lower than expected visits, potentially because other beaches had been discovered earlier in the trip, and the desire for beach relaxation had already been met. If this is accurate, and regional dispersion is a goal, then considering the best locations to promote discovery and exploration needs careful consideration.

6.2.2 Discovery, sustainable travel, and balanced policy outcomes

In terms of balance, promotion of discovery, a key aspect of tourism policy, also needs to be weighed against a wider policy environment that also encompasses sustainable travel (eg lower carbon footprint), environmental concerns (eg impact on the natural ecosystem), road safety (eg fatigue-related issues) and economics (eg increasing demand on infrastructure in less used locations). Mechanisms to help balance road safety outcomes around fatigue and safe access to stops are outlined in more depth in section 6.5. In terms of managing visitor demand, spreading some of the demand at peak times and at peak locations is one mechanism to achieve some balance around demand on the infrastructure. This has further benefits in providing less crowded visitor experiences and reducing 'peak' impacts on wildlife. Another option here is to promote exclusivity, as limiting numbers can impact on desirability.

Sustainable travel in more rural regions, where the population base and geography typically favour the car, is typically more difficult and likely to require supporting behaviour change and promotional initiatives to be successful (eg Le-Klähn and Hall 2015). Their review article indicates there is a growing body of evidence that public transport use by visitors does have a relationship with increased spending behaviour (relative to car drivers), even in rural locations. Yet studies still reveal that even where good public transport is on offer it is often under-utilised by visitors (eg Dickinson and Robbins 2007). One avenue of success is around mode choices that are already perceived as leisure activities, especially cycling and walking, which are a favourable option for visitors (Dickinson and Robbins 2007). For example, the investment in the NZ Cycle Trail enables not only improved visitor awareness, but also improved connectivity, including to local trails. Yet indications from this study show that visitor awareness of unique activity opportunities (which would include the cycle trail) are not a current reason for visiting Northland (this is especially the case for international visitors).

Dickinson and Robbins (2007) suggest shifts in behaviour need to be supported working from the perspective of how visitors experience mobility from their accommodation (as opposed to a focus on the modes of transport to attractions approach). For visitors who wish to be active, this could mean understanding which accommodation best affords opportunities to engage in active travel. Overall, technology now offers better options around personalised travel planning, removing some of the traditional uncertainty around non-car trips (eg Dickinson et al 2014). Similarly, gamification offers opportunities to promote different visitor behaviours around mobility, with activity-based challenges and identifying unique mobility-based experiences (ie where a different mode of travel opens up a new way to experience an area).

6.2.3 Longer stayers success metric

> *[I] loved the area, but didn't have enough time to discover more there.*

Similar to discovery, monitoring both intended and actual length of stay can provide a better picture of what influences any flexibility in length of stay. There are known constraints on duration of stay, such as competing destination-based bookings or return flights. However, there is still limited understanding of the drivers of flexibility around duration of stay and how to increase stay, which could be revealed by monitoring more closely those who do stay longer than intended. Increasing the longer stayers group could be used as a success target for a region. Currently about 40% stayed longer than expected, so a target could be to increase this to 60% staying longer than intended. Satisfaction, but also spend, was higher amongst those who stayed longer than planned, indicating this would be a worthwhile investment.

6.3 Culture and heritage

Visitors had a strong desire for cultural and heritage-specific information to interact with, and further supporting this was experiencing different lifestyles related to likelihood to revisit, and experiencing Māori culture related to recommending Northland to others. From the perspective of how the transport sector can enable a better cultural experience for travellers, this has implications for how people can more readily understand the cultural experiences available to them based on different route choices. The cultural and historical stories already underlying the Northland area are well developed, and recent branding around selected Landmark sites also establishes high value sites to visit. Support branding is important for mitigating language barriers. For example, anecdotally some visitors reported mixing up Māori place names, resulting in their missing the site they were after. This was also revealed in a survey of Landmarks Whenua Tohunga sites, where visitors commented that some of the names were difficult to remember and that sites could be better signposted (Angus & Associates 2017).

In terms of location-based landmarks and wider cultural exploration, Clendon House represented a location that encouraged greater than expected visits drawing visitors to the lower demand region in the west (see section 5.2.4). Other studies have established a relationship between cultural distance, motivation and travel distance. For example, international visitors who desire a culturally different experience, including a desire for learning and self-development, are willing to travel further to gain this (McKercher and du Cros 2003). On the other hand, people with a closer cultural distance (including domestic visitors) may be focused more on hedonistic motivations, such as rest, refreshment and relaxation. In this study, international visitors travelled more widely. This indicates that visitors with a lower knowledge of an area and less experience of travelling in New Zealand conditions may be travelling further and trying to do more in their time, physically and mentally.

This has several implications for regional and seasonal dispersion as well as ensuring a good balance between experiencing more without overdoing it. Promoting ways to break up visitors' cultural experiences will help reduce fatigue. This could be done by ensuring key cultural and heritage sites like Landmark sites are selected to consider spatial aspects, and also advising the duration of trip to see these sites properly. Currently, some locations have a cluster of landmarks (including the east part of Northland), so considering opportunities to identify other points of interest is important. One process for identifying points of interest is to view and promote what similar visitors do in a three-day or seven-day trip (as is currently done in applications like TripAdvisor). This also means that attempting to get seasonal dispersion in visits could be gained by promoting off-season cultural events. Packaged information could also be put into seasonal and non-seasonal trips (especially promoting the off season to those travelling at peak time, but also vice versa).

6.4 Motivations, destination visitors and loyalty visitors

6.4.1 Social motivations

Social motivations are clearly highly valued, but could be quite different from one visitor to another (see section 5.3). People in New Zealand have a reputation for being friendly and welcoming to visitors, and more work could be done around how to leverage this natural strength. Social experiences and events can promote seasonal variation, and also offer resilience in terms of alternatives to poor weather during peak season, where planned activities may no longer work. This is especially relevant to a location like Northland, which relies on seasonal, warm weather activities (eg Harbrow 2016).

6.4.2 International and domestic reasons for visiting

When asked the reason for visiting Northland, the responses from international and domestic visitors indicated differences in their knowledge and perceptions about Northland. Compared with domestic visitors, the international group's travel in Northland may be a chance selection included as part of their North Island or New Zealand visit, rather than a desire to see or participate in specific attractions or activities in Northland (such as the cycling trails). International visitors may not be as knowledgeable as domestic visitors, which indicates the importance of having good information available during the trip to improve the international visitor experience.

Compared with domestic visitors, the only indication of an area where international visitors have higher destination loyalty to Northland is in their likelihood to have visited because of the recommendation of friends or family. This recommendation is currently very low for domestic visitors, which signals an opportunity to promote the location more to friends and family.

6.5 Roads and improving the journey

6.5.1 Satisfaction with the efficiency of travel routes

Expectations inform decisions, so in the context of journeys what to expect from a state highway may differ greatly, especially for international visitors. A visitor from the USA or even Australia may associate a state highway with a long, high-speed, straight road with clear wayfaring and amenity information. Concerns have been raised around a lack of intuitive distinction between road types, so the title 'state highway' can represent a four-lane divided motorway or a lower-volume, lower-speed, single-lane rural road, and also that visitors often underestimate journey times due to the curvy terrain (NZ Transport Agency 2015). However, visitors had relatively neutral or realistic expectations about the duration, distance, directness and choice of travel routes, and were satisfied with these aspects of their journeys (see section 5.3). Arguably, these findings may be different in other road networks where there is a single route, but in the Northland context, with the 'Twin Coast' network approach, there is an east and west coast loop available to visitors, providing visitors with choice.

6.5.2 Road safety, driving conditions, and journey length

Concerns have previously been raised around misleading images of easy New Zealand driving conditions during marketing campaigns (NZ Transport Agency 2015), so visitors may have unrealistic expectations. Also, New Zealand does not score highly for its road infrastructure on a world scale, being rated as 4.7 out of 7, and ranking 47th when compared with other developed countries (World Economic Forum 2016). Visitors in this study did have relatively realistic and neutral expectations around the road conditions to expect, which is perhaps part of why, overall, they were satisfied with the condition of the road. The road

condition is important to visitors, as it does relate to general satisfaction, but it was less influential when compared with more salient factors, like rest stops or roadside scenery. Arguably this is because visitors may only notice major changes to the road surface like large potholes or a shift to an unsealed road, and may not notice less visible changes to the road surface (like flushing)[23], even though these can impact on actual safety.

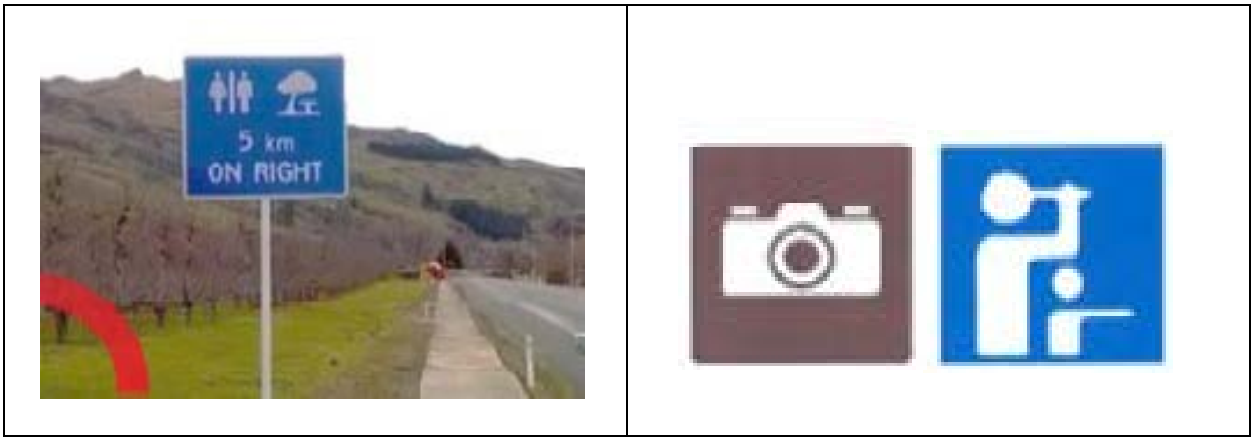
The novel finding that can relate to the fatigue side of road safety was that about 40% of visitors are active for between 5 and 10 hours and about 10% are active for over 10 hours each day. People typically stop at least twice during their journeys, but this length of active time is likely to relate to fatigue. This is especially relevant for drivers who also have the compounding influence of having just come from a different time zone. Promotion of stops to break up the journey, improved access, advanced warning and safe stopping are all discussed in the following sections.

6.5.3 Ease of access to sites, rest stops and services

In terms of route-based infrastructure, the type and number of rest stops and services (such as petrol stations) both exceeded expectations. However, the ease of access to sites of interest, while it rated positively, did not exceed expectations, and is an area to target improvements.

This finding is supported by another recent New Zealand visitor study in the South Island of New Zealand, which focused on visitor perceptions of safety and how this influenced journey enjoyment (Attwell 2017). In the South Island study, about one in four overseas visitors expressed their desire to improve the scenic route experience (Attwell 2017), including an increase in stopping places and improved visitor signage. Consequently, specific relevant treatment solutions being implemented and evaluated include the use of advance warning signs 2km and 5km in advance of a rest stop (in addition to the existing 300–400m currently used), and the use of the internationally recognised 'camera' and 'lookout' symbols on familiar brown tourist signs indicating scenic views, see figure 6.1 (Attwell 2017).

Figure 6.1 Examples of static signage improvements for visitors, with advanced warning (left) and two icons for 'camera' and 'lookout' (right, Attwell 2017)



These solutions leverage off familiar, recognised icons and remove some of the language barriers. This also provides visitors with early warning, which is especially helpful around a spontaneous decision to

[23] Flushing is where the texture depth of the road surface is worn away over time, resulting in a loss of skid resistance. See Herrington et al 2015).

stop. We know the majority of visitors are travelling with other passengers, so this allows time to discuss and agree whether or not to stop.

6.5.4 Technology and stops

Complementing static signage, technology-based approaches could assist ease of access and remove some of the anxiety around the location of upcoming stops on the journey. For example, geo-tagged photographs of route landmarks and lookout locations provide visual familiarity with upcoming stopping locations, exact distances and allow for crowd-sourcing of less-known stops, especially where there are large distances with no existing stops. Such techniques have been successfully assessed in the context of visitor planning within a city context by using geotagged photos from social media (Flickr), in terms of an ability to provide a ranking of top landmarks and deliver an enjoyable route choice (Sun et al 2013).

6.6 A hierarchy approach to journey level of service

6.6.1 Information level of service

If you considered a hierarchy approach to an information level of service, then based on the findings of this study there are key points where a higher level of information would be of great value. This may include physical signage, information at stops, additional online information, and consideration of other mechanisms to push information to visitors at key locations. Considerations include:

- Route connection points: Providing additional advanced warning information prior to key connections to encourage exploration at the decision point (eg the east–west connection point in Northland). This provides the benefit of choice for visitors, as we know they desire flexibility and discovery when deciding where to travel. This would be applicable to other New Zealand locations beyond Northland, in particular the West Coast of the South Island.
- High value rest stops and landmarks: To provide additional information to improve access and the use of higher value stops on the route. This includes earlier advanced warning signs of these stops, possibly as far as 5 km in advance and reminder signage closer to the site. This allows time for a conversation with passengers and possibly allows passengers to look up additional information. See also section 6.6.2 for more about higher value stops. This would complement and extend the existing Landmarks Whenua Tohunga pilot and be a key enabler of regional dispersion.
- Activity-based information: Physical signage and information at stops to consider a wider set of key locations, including relaxing locations like beaches, locations where there are different physical activities (eg walking, cycling, swimming, diving), and places that allow for social interaction with locals (eg places to seek refreshing beverages).
- Online information: To support the physical signage suggestions above, a higher level of service and access to information with an online presence and education about key stops, landmarks and route choices (eg east–west connections) would be of benefit. This provides the ability to have more supporting content. For example, enabling access to geo-tagged pictures showing the stop entrance and any landmarks preceding the stop would help safe navigation and reduce anxiety about missing the stop (ie for passengers supporting a driver). Also, showing pictures of the actual stops for visitors to access and what other people photographed at these sites would help inform their decision to stop here. This could be provided via existing social media channels that already have this capacity (such as TripAdvisor, Flickr or Facebook).

6.6.2 Signature rest stops, key landmarks and supporting infrastructure

If the goal of greater exploration of regions is achieved, then the pressure from increased visitor demand will impact on the resources required at rest stops. One mechanism for addressing this is to promote key destinations that already have staff present, through programmes such as those promoting Northland Landmarks. Another is to locate and promote a few well-placed 'signature' rest stops that have a higher level of service than other stops. Denstadli and Jacobsen (2011) suggest that signage alone will not significantly improve route loyalty (at least on established routes), and strongly recommend the use of visual impressions to guide the placement of key sites, so identifying locations for signature stops that provide a visual experience is critical.

Below are some elements that could be considered for locations, supporting infrastructure and benefits for signature rest stops. Many of these considerations are also applicable to existing visitor sites, such as those included in Landmarks Whenua Tohunga.

- Visitor experiences: Stops are linked to visitor satisfaction metrics, and exceeding expectations is more achievable if it is done at fewer sites. Locating these sites should take into account existing user demand and satisfaction, as well as motivations that are linked to key factors, including the amenities, ability to relax and the desire for great scenery.
- Photograph locations: Stops that provide a photograph opportunity deserve a special mention, as they can attract visitors by providing supporting amenities like scenic platforms or art that encourages taking photographs. They can also influence safety by encouraging visitors to take photos at a safe distance from the road, which can be an issue in some locations. New construction and large-scale safety improvements should take safe stopping locations into account in the design phase.
- Signage and information: Informing visitors about which rest stops offer a higher level of service could be as simple as keeping the existing rest stop logo but making it larger and bolder, and increasing the size of the overall sign (which would also allow for earlier and easier detection by motorists). Once at these stops, better, more detailed information about the route visitors are on and other key stops could also be provided.
- Personal security: Security was another motivation of visitors, so the benefit of increased social surveillance via more people, improved surveillance technology, and an opportunity for the use of best practice crime prevention through environmental design techniques to improve security becomes more viable at a fewer number of stops.
- Driver fatigue: About 1 in 10 visitors were active for over 10 hours each day, which can cause fatigue. The frequency of stops could be increased by placing them at key locations where there are long stretches between significant visitor destinations. By providing a better experience at the stop this may increase the time spent there.
- Road safety infrastructure: These higher frequency stops would also allow for higher provision of road and roadside infrastructure to improve safety (such as lane arrows and signs to remind the driver to keep left, longer painted turning bays when crossing the road is required, and shifting the location of less visible or accessible entrances).

6.7 Limitations and lessons

Mostly due to a combination of limited internet reliability and the need for increased face-to-face recruitment strategies, participants in the intercept sample were selected primarily in one location. Also, the majority of visitors in the initial intercept sample were international. However, the travel sample, which

resulted in more in-depth and arguably novel findings, had a more even split. There were also some extreme wet weather events during the recruitment phase, which may have influenced participation rates, behaviours and satisfaction scores. Perhaps the most significant limitation for this pilot was the level at which most visitors interacted with the application intervention during their travel. If some key mitigation approaches focused on reducing barriers to user effort, privacy and internet access, a wider study would likely reveal even better visitor insights (see appendix A for more information on suggested mitigation approaches).

7 Recommendations

7.1 Transport sector recommendations

We recommend the transport sector consider the following:

1 Develop a national roadside information level of service: Use a hierarchy-based approach to increase the level of service for both signage and route guidance at key locations. For example, use repeated advanced warning signage and improved content for decisions at key route connection points, so drivers are explicitly reminded of key decision points (see section 6.6.1 for detailed bullet point considerations).

2 Visitor route content: Consider opportunities for innovative 'during-route' content that supports existing visitor motivations, such as exploration and cultural star ratings for routes, or the development of location-triggered information to push out to passengers (see sections 6.2 and 6.3 for more on this).

3 Road quality improvements: Continue to focus on fundamental road quality improvements and maintenance programmes based on growth in user demand for roads, as road condition requirements are for the most part equally applicable to visiting and local road users. Provide location-based information and ratings to support road quality expectations (eg understanding of unsealed road locations or driving difficulty ratings), working with agencies such as the Automobile Association and i-Sites to package and deliver this, as well as working with developers (eg compatibility with Google Maps).

4 Visitor fatigue: Duration of trips by visitors indicates the potential for fatigue. Consider monitoring and matching longer trip locations with opportunities to take stops to break up the trip, considering factors such as better information, improved access and advanced warning of desirable stops.

7.2 Cross-sector recommendations

We also recommend considering the following, taking a broader inter-agency approach to delivery, continuing to work with local road controlling agencies, tourism, conservation and heritage agencies to deliver a packaged visitor experience, enabling content and infrastructure beyond the road and roadside:

1 Signature rest stops and landmarks: Taking a hierarchy-based approach to promote strategic or signature rest stops, as well as significant cultural and historical landmarks, including better information, but also supporting higher-quality infrastructure (such as around road safety). Widen this approach to include cross-sector considerations of these sites, including personal security, amenities that promote relaxation (of potential benefit to reducing fatigue) and scenic experiences (see section 6.6.2). This would complement existing projects, such as the Landmarks Whenua Tohunga pilot.

2 Signage and access review: Perform a physical signage and access review to identify gaps in roadside signage (based on content and location, including advanced warning signs), access issues (like visibility of entrances to stops and turn-offs). Ensure this is a cross-agency evaluation to ensure road sign symbols are consistent with tourism industry icons to improve visitor familiarity and early recognition (see section 6.5.3 for more detail).

3 Promote visitor mobile phone coverage information: Provide an accessible map that includes layers of information around known dead zones with no mobile phone coverage, locations with accessible wifi, and free wifi to assist access to key locations, support visitor wayfinding and reduce anxiety on key

routes. A more customer-focused approach would allow users to access other relevant layers on this map, such as road quality and driving difficulty ratings, key rest stops or landmarks, and to download this as off-line content.

4 Deeper visitor insights: Collect in-depth visitor insights to complement existing, more representative but 'shallower' data around domestic and international visitors. This could build on the framework, behaviour change approach and learnings from the application developed in this pilot to enable quantifiable evaluation of visitor experiences and interventions during the trip.

5 Monitor 'discovery': Monitor, map and understand factors relating to the discovery of specific destinations, where visitors travel to sites at a higher rate than intended or planned. Identifying and understanding why these locations are more successful in the during-trip phase of travel will enable better accessibility initiatives, meet visitor desires to discover new areas, and enable regional dispersion.

6 Wider policy implications: Review opportunities to support discovery and exploration balanced against opportunities to promote more sustainable routes and travel modes, to meet wider policy outcomes. In particular, review spatial connectivity around cycling and walking infrastructure (including with accommodation options, key scenic locations and safe connections across roads). This would be of high value, would build on existing work (like the New Zealand Cycle Trail), and enable exploration and new visitor experiences (see section 6.2.2).

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Appendix A: Lessons around application-based interventions

A1 Lessons learned around web-based applications

- Internet access and reliability in the proposed study region must be established, including the existence of any areas without connectivity. Usability testing must take place in the live environment, (ie national region) where the study is going to take place and should include an assessment of connectivity available in accommodation, and facilities that offer internet provision. Having a downloadable application that is accessible offline could also be considered.
- Usability testing should include ability to locate the application through different search engines (Google, Chrome etc) as well as by older phone models that may have outdated software unable to access the full features of the application.
- Issues around GPS locating and privacy need to be carefully thought through to minimise the impact on recruitment. Clarity of information around purpose (ie safety requirement for non-use of application when driving) and privacy are essential, particularly when there is no face-to-face opportunity for explanation or reassurance.
- Where both a control group and an intervention group are being utilised, it is wise to recruit in discrete blocks, eg one week per group, as this allows the recruiter to promote the 'exciting' aspects of the intervention application to those who receive it, and thus encourage participants' engagement.
- Pre-travel/sign-up survey questions should be streamlined to the bare essentials in order to encourage subsequent engagement and retention. A multiple-methods approach is likely to be helpful to elicit both large numbers of responses via quick and easy online survey questions, as well as more in-depth responses to some key characteristics that require further exploration.
- For higher effort from participants (ie looking at in-depth, longitudinal behaviour), spending extra face-to-face time per person is critical. For the social and challenge aspects to be improved, introducing participants may also support engagement.

A2 Practical mitigations applied to the Northland pilot study

1 Location of recruitment at an I-Site visitor information centre (Whangarei) which offered:

   a free internet access in a region of Northland where fast-fibre broadband had been installed

   b a well-known visitor complex offering a visitor information centre, café, large parking area, over-night parking, toilets and showers

   c high levels of foot-traffic through the complex, due to its location on the main highway to popular destinations along the east coast and access to the Far North.

   d scheduled stop for bus tour operators.

2 Stream-lining of the survey, in particular the pre-travel survey

3 High level of face-to-face interaction, with immediate sign-up of participants by three on-site staff

4 Staff on hand to assist with technical, process or privacy queries

5 Sign-up on multiple lap-top computers (faster process) as well as mobile phones

6 Convenience incentivisation, with a free drink at the café while participants complete the survey, and making the main prize draw more obvious

7 Building relationships with local businesses to promote the study.