

**TOURISM BENEFITS FROM
SEALING UNSEALED ROADS:
SURVEY OF USERS OF
WAIPOUA FOREST ROAD**

Transfund New Zealand Research Report No. 86

**TOURISM BENEFITS FROM
SEALING UNSEALED ROADS:
SURVEY OF USERS OF
WAIPOUA FOREST ROAD**

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EXECUTIVE SUMMARY

1. Introduction

This report records part of a research programme on "Tourism benefits from sealing unsealed roads" to address concerns raised that the Transit New Zealand project evaluation procedures may not fully account for benefits arising from improving roads in certain tourist areas. If roads in these areas were improved, by being sealed for example, the benefits from tourists who may decide to visit New Zealand more often, or to stay longer, need to be recognised. This report records the effects of improving the Waipoua Forest section of State Highway 12, Northland, New Zealand, by a "before and after" study of the attitudes of tourists and others users. The study was carried out between 1993 and 1997.

The results of this research, and the findings of other related Australasian research projects, have been summarised and conclusions drawn in regard to the scope and size of benefits from tourism arising from sealing unsealed roads.

2. Methodology

A pilot survey was undertaken in December 1993 (at Waipoua Forest) and in January 1994 (at Paihia, Northland) to check the survey locations and to ensure that the questionnaires elicited appropriate responses. Several key elements of the main before (1994) and after (1997) surveys were then determined:

- Tane Mahuta (the "Big Tree") parking area was selected as the Waipoua survey site.
- Paihia was selected for half the interviews so that visitors who may have decided to avoid the road could also be interviewed.

The two-pronged approach was considered to be the best, with information from the Waipoua site attempting to measure shifts in travellers' perceptions as a result of the sealing, and that from the Paihia survey site measuring shifts in behaviour.

The responses from the before (1994) and after (1997) surveys have been analysed and compared to identify any changes which have taken place in the time between the two surveys. These changes have then been examined to assess the degree of change, if any, which can be attributed to the sealing of the Waipoua Forest road.

3. Analyses of Results

Analyses of the responses were grouped under the following topics:

Traffic counts; country of origin; origin and destination; trip purpose; mode of travel; route knowledge; choice of route; visitor impressions of route; reactions to unsealed roads.

4. Main Findings

- Traffic volumes through the Waipoua Forest have been increasing over the last few years as the road sealing programme has come to completion. In 1996 they increased by 20% above the traffic growth rate for the rest of Northland.

- The number of all vehicles counted at Waipoua Forest increased by 50% from the before survey to the after survey.
- The purpose of trip for travellers passing through Waipoua Forest had changed significantly from the before survey to the after survey. For example the proportion of people on holiday had doubled over the 3 years.
- Of the Waipoua Forest respondents in the after survey, 28% indicated that, if the route had not been sealed, it would have affected their choice of route, although only 7% would actually change their route. In the before survey, 14% of people who would not be travelling via Waipoua had indicated the road condition was a factor in their decision.
- The proportion of people who described Waipoua as a "must see" area increased significantly from 44% in the before survey to 61% in the after survey.
- Of respondents in the before survey, 28% indicated that safety concerns related to road sealing were a feature they disliked about the Waipoua Forest route. In the after survey 21% respondents gave the condition of the road as one of the main features they liked. The road-related dislikes were: too winding 17%, safety (general) 13%, and poor signage 13%.
- Of respondents in the after survey who had travelled the Waipoua Forest route before, 37% now used it more frequently because it was sealed and safer.
- The attitude towards unsealed roads was similar in both surveys, being generally negative with a small group having a positive concept of them (i.e. for the adventure): International tourists have a stronger preference for sealed roads than New Zealanders.

5. Conclusions

Completion of the road sealing has affected the attitudes and behaviour of tourists in regard to travelling through Waipoua Forest. A higher proportion of tourists surveyed after the sealing, than before sealing, considered the Waipoua area to be a "must see" area, and would encourage their friends/relatives to visit it.

They also considered the road condition to be good, which compares with a significant level of negative feeling about the road before sealing. Use of the Waipoua Forest road has increased significantly following completion of the sealing programme, and local tourist operators have reported increased levels of tourist activity.

Sealing unsealed roads will have some effect on the levels of road use by holiday makers, both domestic and international. However, the actual effect on international tourist holiday plans could not be determined solely from this research.

ABSTRACT

This report records part of a research programme on "Tourism benefits from sealing unsealed roads" to address concerns raised that the Transit New Zealand project evaluation procedures may not fully account for benefits arising from improving roads in certain tourist areas. If roads in certain areas are improved by being sealed, the benefits from tourists who may decide to visit New Zealand more often, or to stay longer, need to be recognised.

This report records the effects of improving the Waipoua Forest section of State Highway 12, Northland, New Zealand, using a "before and after" study of the attitudes of tourists and other users. The study was carried out between 1993 and 1997. The responses from the before (1994) and after (1997) surveys have been analysed and compared to identify any changes which have taken place between the two surveys. These changes have then been examined to assess the degree of change, if any, which can be attributed to the sealing of the Waipoua Forest road.

Completion of the road sealing has affected the attitudes and behaviour of tourists in regard to travelling through Waipoua Forest. Use of the Waipoua road has increased significantly following completion of the sealing programme, and local tourist operators have reported increased levels of tourist activity.

1. INTRODUCTION

1.1 Project Objectives and Scope

This project is part of the research programme on "Tourism benefits from sealing unsealed roads" which was undertaken by the then Transit New Zealand in association with the New Zealand Ministry of Tourism. The programme was commissioned because of concerns that the Transit New Zealand project evaluation procedures may not fully account for benefits arising from improving roads in certain tourist areas. If roads in these areas were improved, by being sealed for example, benefits arising from tourists deciding to visit New Zealand more often, or to stay longer, need to be recognised.

The terms of reference originally defined the overall objective of this project as being:

... to investigate the effects of sealing of the Haast Highway on tourist travel patterns within the area influenced by the Haast Highway, by means of a "before" (1993) and "after" survey (1994 and 1995) of motorists on the Haast Highway. ...

In addition it was intended:

... that the survey results, together with the findings from other projects in the same research programme, be used to provide estimates of the effects of the sealing of unsealed roads that are tourist routes on tourist expenditure in New Zealand ...

A preliminary review of the section of unsealed road on the Haast Highway, between Westland and Otago, South Island, revealed however that road works had reached an advanced stage. Only a short section remained to be sealed and work had already commenced in preparation for sealing. A change of location was therefore deemed advisable, and the subject road was changed to the Waipoua Forest section of State Highway (SH) 12, in Northland, North Island.

1.2 Project Structure

This project consisted of a "before and after" study of the attitudes of tourists and others using the Waipoua Forest section of SH12. The before study was carried out by Travers Morgan (NZ) Ltd, and the after study by Booz•Allen & Hamilton (NZ) Ltd. The project was split into three main stages:

- Stage 1: Before survey,
- Stage 2: First after survey,
- Stage 3: Second after survey.

Stages 1 and 2 have been undertaken (in 1994 and 1997), and this report presents the results of them. The need for Stage 3, which was to be a second after survey, is discussed in this report.

The results of this research, along with the findings of other related Australasian research projects, have been summarised and conclusions drawn in regard to the scope and size of tourism benefits arising from sealing unsealed roads. These are presented in Appendix 1.

1.3 Structure of Report

The remainder of this report is structured as follows:

- Section 2 - provides background information about travel on the Waipoua Forest road and in Northland generally.
- Section 3 - describes the survey methodology and implementation.
- Section 4 - analyses the results of the after survey and compares these with the before survey.
- Section 5 - presents the main findings from the first two stages of this research, and discusses the need for Stage 3.
- Appendix 1 - summarises findings of related Australasian research projects.

2. *Background*

2. BACKGROUND

2.1 Sealing Programme

The unsealed sections of SH12, principally within the Waipoua Forest, were studied. An ongoing programme of sealing has been carried out over the last 10 years with the objective to complete the Waipoua Forest section by the end of 1995. Table 2.1 shows the lengths of sealing completed each year since 1984. Figure 2.1 shows the locations of the sealing work undertaken for the forest section.

Table 2.1 Sealing the Waipoua Road, 1984 - 1996.

Year of Sealing	Description	Length (km)
1984	Tane Mahuta - Te Matua Ngahere	1.29
1984/85	Four Sisters Extension	1.29
1986/87	Prouds Road - Aranga	6.44
1988/89	North Forest Entrance, Wairau Summit	1.32
1992/93	Waipoua Bridge - South Forest Boundary	4.1
1993	Whirinaki Hill	2.2 ¹
1993/94	Waimamaku - North Forest Entrance	6.1
1995/96	Wairau Summit - Tane Mahuta - Te Matua Ngahere - Waipoua Bridge	11

¹ Includes 0.6 km of route shortening.

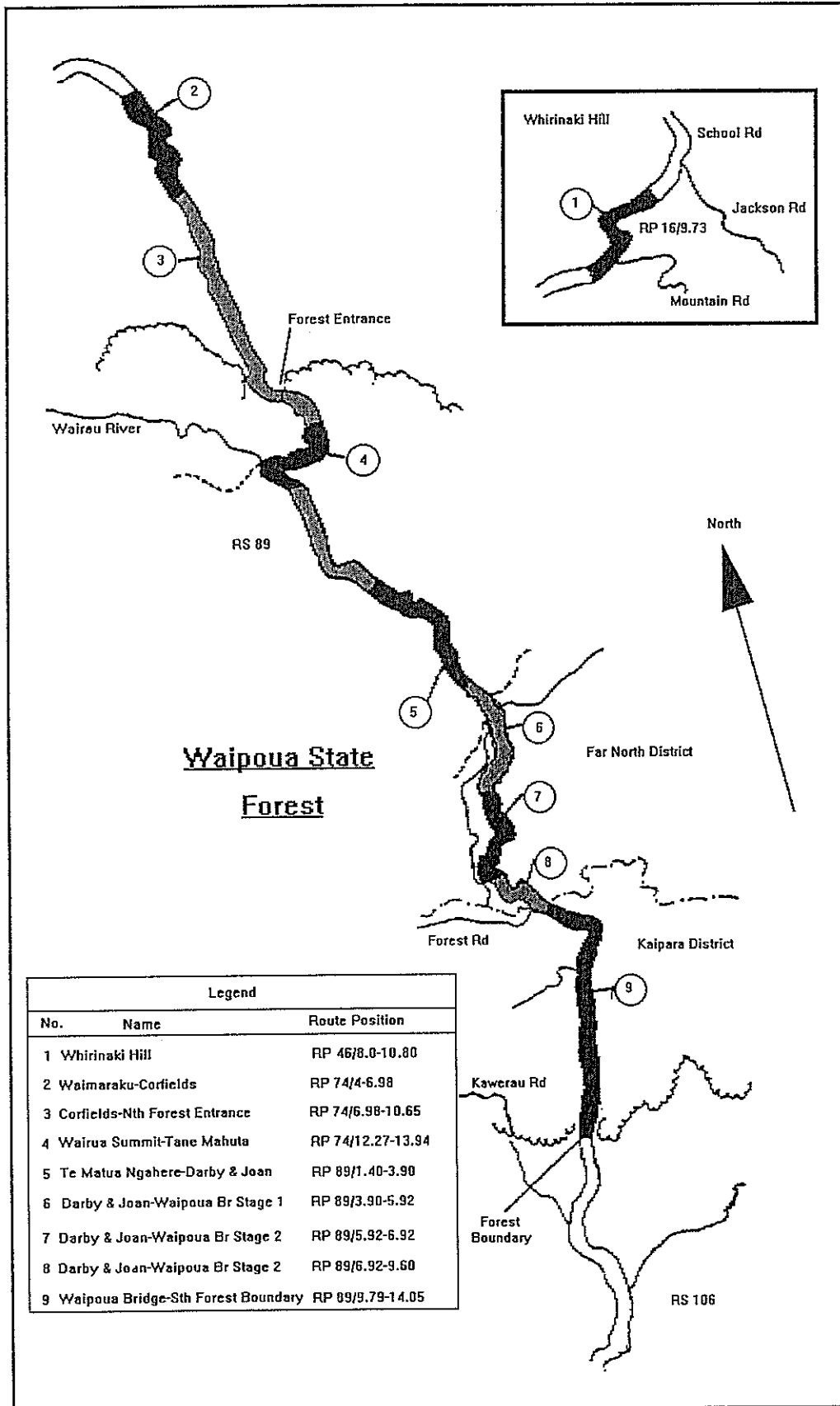
2.2 Traffic Flows

2.2.1 Annual Growth

Transit New Zealand records the traffic flows at selected sites on each state highway. Traffic volumes at key Northland sites have been analysed (Figure 2.2 shows the locations), and the data are shown in Figures 2.3-2.6.

Traffic flows are measured using mechanical counters. Counts are undertaken for a period of several weeks and the results are then factored to give estimated average annual daily traffic (AADT) flows. Traffic in Northland has been increasing steadily at about 5% per annum. By comparison traffic volumes were relatively static on SH12 between 1989 and 1994, and the sealing programme appeared to have had little impact on traffic volumes during this time.

Figure 2.1 Location of sealing work in Waipoua Forest study site.
(See Figure 2.2 for its location in Northland.)



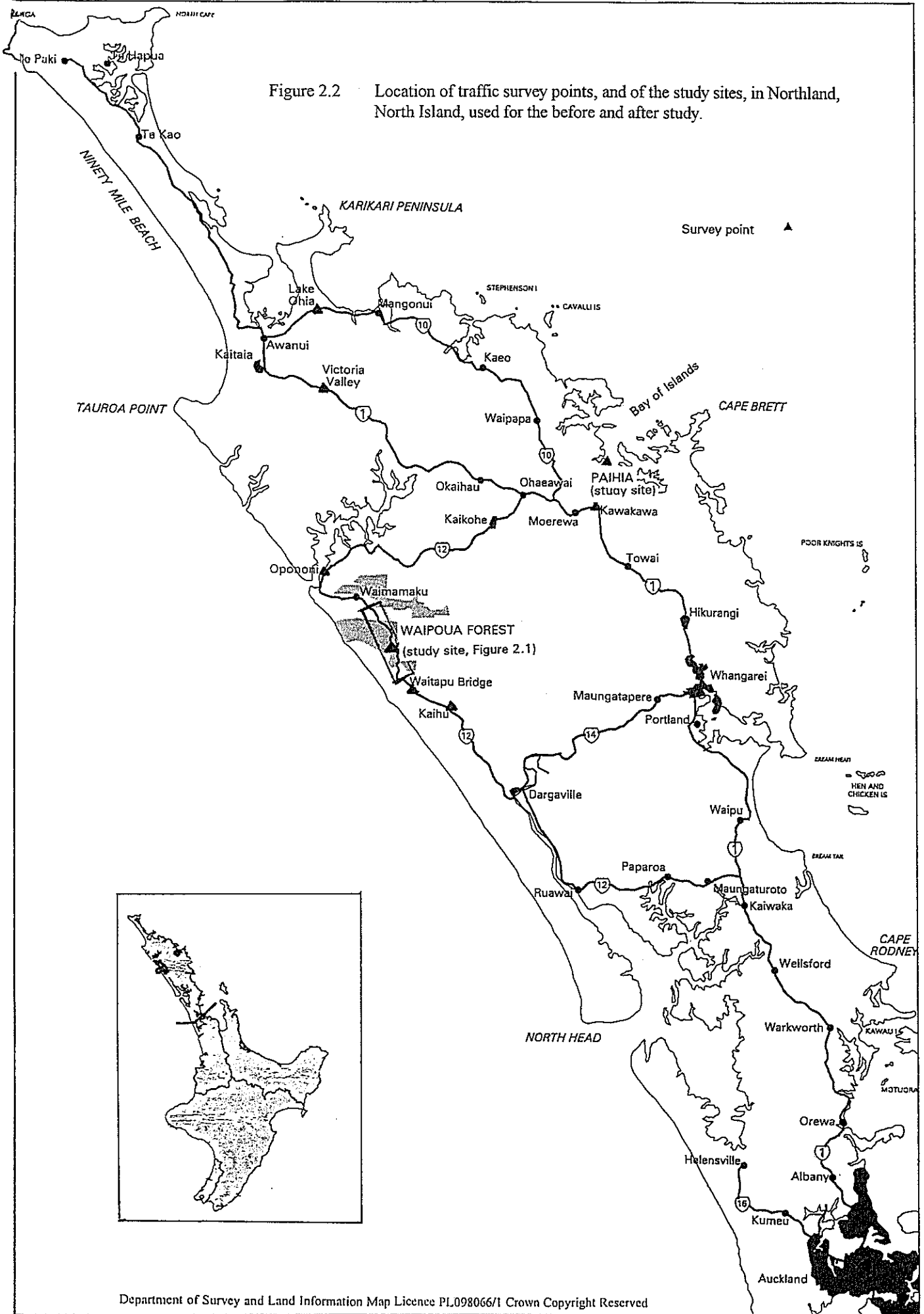


Figure 2.2 Location of traffic survey points, and of the study sites, in Northland, North Island, used for the before and after study.

However, the last few years have seen an upward trend in traffic through the Waipoua Forest itself, which corresponds to the completion of the sealing programme (April 1996). Traffic through the forest increased by around 20% above the growth rate for the rest of Northland in 1996. However, it is too early to say whether this increase is all attributable to the sealing. Analysis of traffic flows over several more years is required before a definitive conclusion can be reached.

2.2.2 Seasonality of Traffic Flows

Traffic volumes at Kawakawa, Northland, are recorded throughout the year, and are used to determine seasonality factors which are then applied to sample counts at other sites to estimate annual flows. Figure 2.6 shows the counts taken at Kawakawa in 1991.

This graph shows a difference of about 500 vehicles per day (vpd) between summer (December-February) and winter (June-August). Within this period some variations are noted for Easter (end of March) and the May holidays, suggesting that the variation is largely caused by leisure travel.

2.3 Visitor Characteristics

The International Visitor Surveys (IVS), conducted on behalf of the New Zealand Tourism Board, found that international visitors to Northland in 1991 and 1995/96 were mostly from Australia, USA, UK and Europe. Northland is not a major destination for the growing number of visitors from Asia, who made up 31.5% of all visitors to New Zealand in 1995/96. The proportions of international visitors travelling to Northland are shown in Table 2.2.

Table 2.2 International visitor surveys 1991 and 1995/96: international visitors to Northland (% of all visitors to New Zealand).

Source: IVS, NZ Tourism Board

Country	1991	1995/96
Australia	33	30
USA	14	16
UK	15	20
Canada	4	0
Europe other than UK	23	20
Asia	11	6
Other	0	8
Total	100%	100%

2. Background

Figure 2.3 Annual average daily traffic (AADT) counts made at four locations* in Northland (see Figure 2.2 for locations).

*(Victoria Valley (south of Kaitaia), Kawakawa (near Bay of Islands), Lake Ohia bridge (east of Kaitaia), and Waipoua Forest headquarters, Northland)

Source: TNZ annual statistics

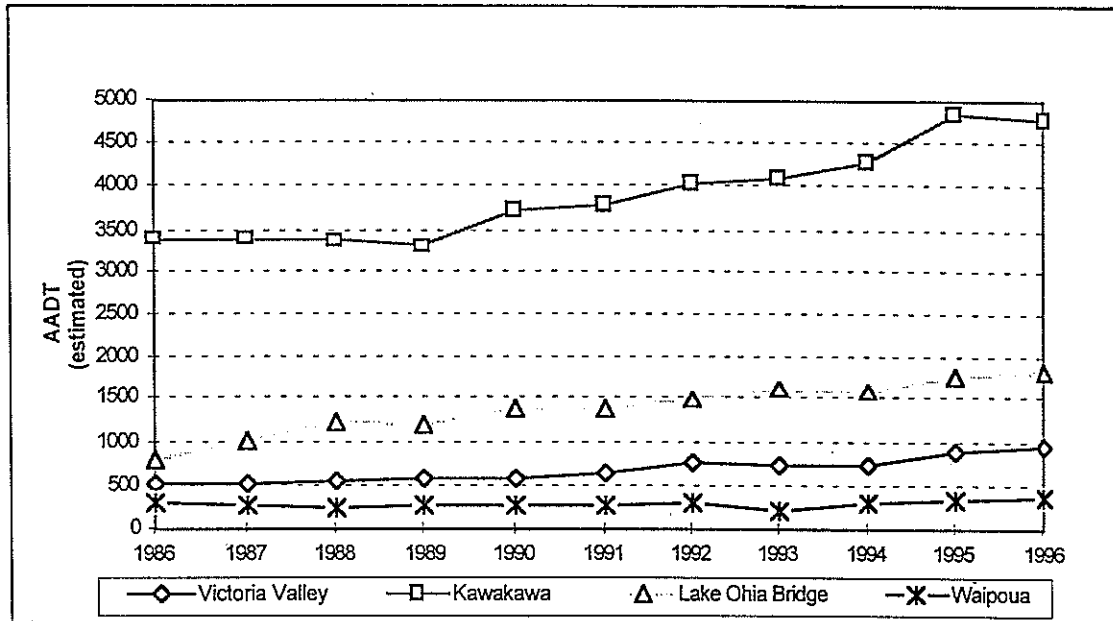


Figure 2.4 Annual average daily traffic (AADT) volumes taken at four locations* near Waipoua Forest on SH12, Northland (see Figure 2.2 for locations).

*(Opononi North, Waipoua Forest HQ, Waitapu bridge, Kaihu)

Source: TNZ annual statistics

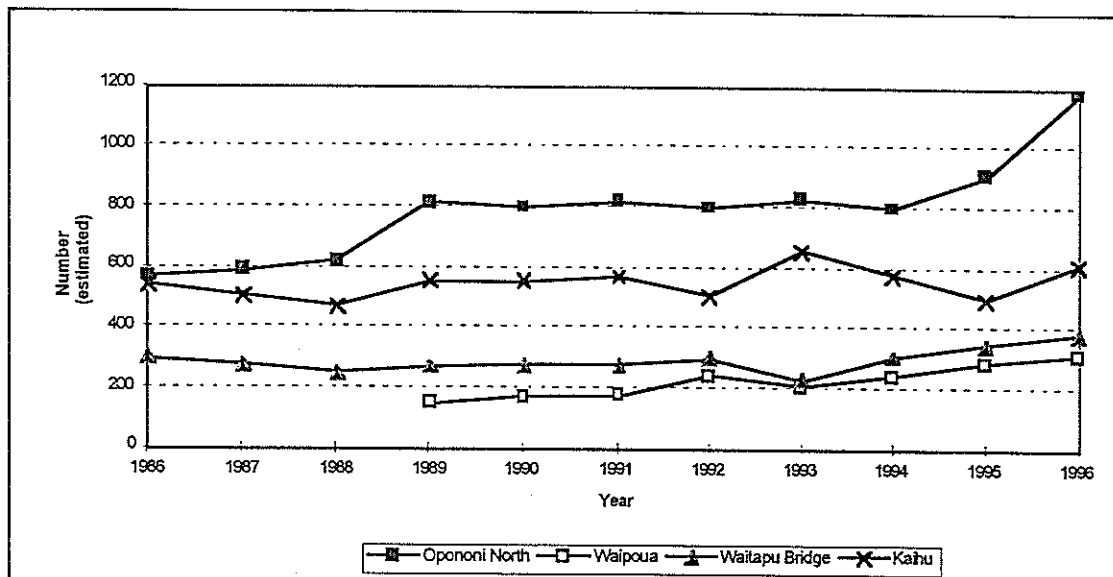


Figure 2.5 Cumulative traffic growth (expressed as % change) since 1986 estimated for SH12, SH10 and SH1. *Source: TNZ annual statistics*

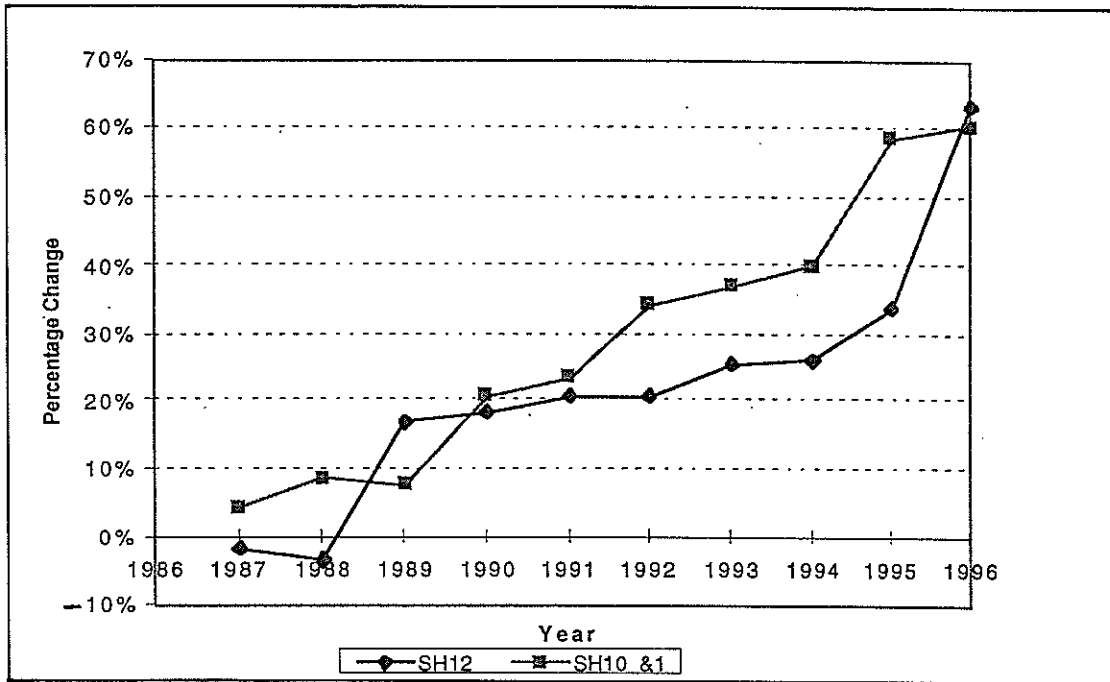
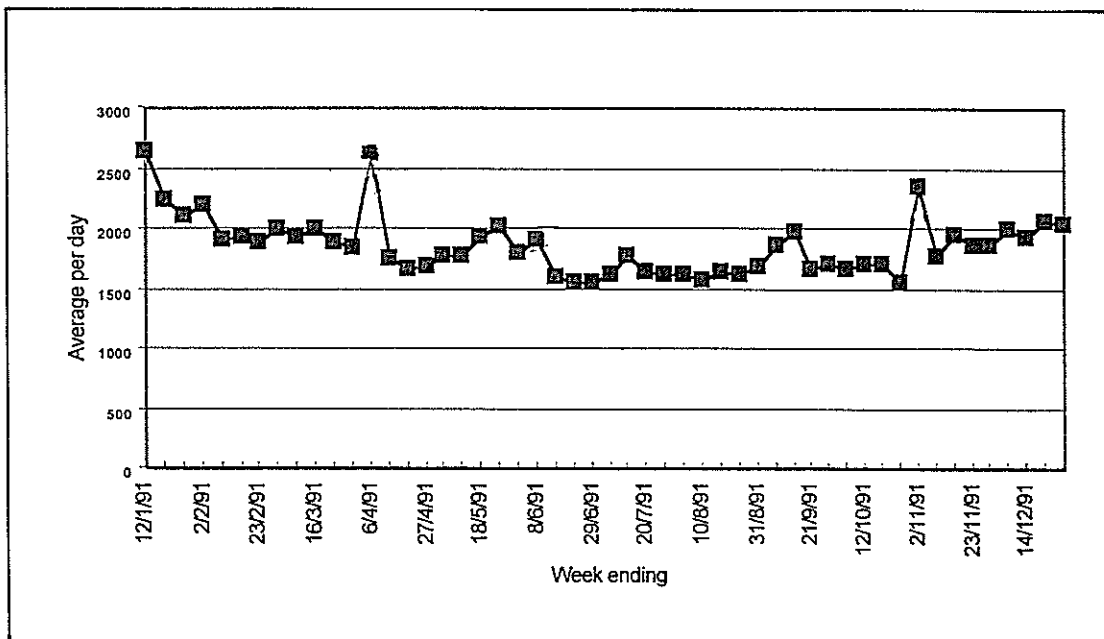


Figure 2.6 Seasonal traffic flow data (average number of vehicles per day) taken at Kawakawa, near Bay of Islands, for the calendar year 1991. *Source: TNZ annual statistics*



3. *Methodology & Implementation*

Two surveys of visitors to the Waipoua Forest have been conducted by the Department of Conservation (DoC) since 1990, and the results of these are summarised below:

- *Survey of Visitors to Waipoua Forest Visitor Centre, Dec. 1990-Feb. 1991*
114 interviews of people over the age of 15 (who spoke English) were conducted on the "next to pass" basis. Around 42% were New Zealanders, with the largest other groups being German 17%, British 13% and Australian 5%. People travelling by private car accounted for 75%, and the next most used mode was rental car. As the Visitor Centre is off the main road this survey may not represent a good sample of travellers through the Forest, or of visitors to it.
- *Waipoua Forest Visitors Survey, Mar.-Apr. 1994*
500 interviews were conducted at the entrance to the Tane Mahuta track on a "next-to-pass" basis. International visitors accounted for 75%, with most coming from Australia and Germany. Visitors travelling by private car were 47%, by rental car 25%, and 15% by coach or bus.

3. **METHODOLOGY & IMPLEMENTATION**

3.1 **Methodology**

The aim of this project was to investigate the effect of sealing the Waipoua Forest road on tourist travel patterns in the area by means of a before and after survey. The survey therefore had to be designed in such a way that comparisons could be made between the responses obtained before and those obtained after sealing.

3.1.1 **Pilot Survey**

A pilot survey was undertaken in December 1993 (at Waipoua Forest) and January 1994 (at Paihia) to check the survey locations and to ensure that the questionnaires elicited appropriate responses.

As a result of this pilot survey several key elements of the main surveys were determined:

- Tane Mahuta (the "Big Tree") parking area was selected as the Waipoua survey site. This is at the north end of the forest. This location was selected for the before survey because northbound travellers had just driven over the main unsealed section through the forest, and southbound travellers had just entered the forest, having driven over an unsealed section mainly through farmland.

- Paihia was selected for half the interviews (at the Information Centre, the Post Office, and in the shopping complex) so that visitors who had decided to avoid the road could also be interviewed. The Waipoua survey site would only "catch" people who had already decided to use the route, and could distort the results if used on its own.

The pilot survey did not show clear evidence of the unsealed road dissuading travel, although some negative reactions to unsealed roads were recorded in Paihia. The conclusion was that the effect which was being measured was somewhat elusive. The two-pronged approach was considered to be the best, with the original survey site in Waipoua Forest attempting to measure shifts in travellers' perceptions as a result of the sealing, and the Paihia survey site measuring shifts in behaviour.

3.1.2 Main Before and After Survey

The main survey consisted of a before survey carried out in February 1994 and an after survey in February 1997. Visitors to Tane Mahuta were randomly interviewed as they arrived in the parking area, with few people on coach tours being interviewed. Both components involved:

- Personal interview survey of travellers at the Waipoua Forest site to capture people travelling on Waipoua Forest Road.
- Traffic counts on SH12 in conjunction with the Waipoua survey to ascertain the "capture rate" (proportion of people surveyed to vehicles passing survey point), and to determine the total number of vehicles travelling on the road, thereby enabling comparisons between the before and after surveys.
- Personal interview survey of tourists at the Paihia sites to capture people who may have decided to avoid the Waipoua Forest Road because of perceptions about the road's condition.

3.2 Implementation

3.2.1 Before Survey

Travellers were surveyed at Waipoua Forest on 18-19 February (Friday-Saturday) and at Paihia on 20-21 February (Sunday-Monday) 1994. A total of 120 surveys were completed at each of the two sites.

The Tane Mahuta (Big Tree) site at Waipoua Forest proved ideal, with a constant stream of potential interviewees stopping at the parking area, and no difficulties in persuading people to take part.

At Paihia, obtaining the international visitors who were the targeted candidates proved more difficult as they were in the minority. Although a cruise ship was in port at Opuha during the Paihia survey, tourists from the cruise ship had to be excluded from the interviews as they did not have the option of travelling over the Waipoua Forest road.

3. Methodology & Implementation

Both weather conditions and time were recorded on the survey forms to enable comparison with the after survey. The weather at Waipoua on both days (18-19 February) was a mixture of overcast but warm conditions with intermittent showers followed by bright patches of sunshine. At Paihia, the weather was similar to that in Waipoua but with the occasional heavy shower on 20 February and bright clear skies the next day (21 February).

3.2.2 After Survey

A minimum of 100 interviews at each site was set as the sample size for the after survey. This was considered to be an adequate sample to enable reasonable comparisons to be made. The weather was overcast for both the Waipoua and Paihia after surveys.

As for the before survey, separate questionnaires were developed for the Waipoua and Paihia interviews. Most of the questions from the before survey questionnaires were retained for the after survey, but several questions were modified to reflect the current condition of the road.

The Waipoua Forest survey was carried out at the parking area on SH12 near Tane Mahuta on 15-16 February 1997 (Saturday and Sunday). A total of 169 interviews were carried out. As with the before survey, this site provided a constant stream of potential interviewees from people stopping at the parking area and most people were willing to take part.

The Paihia survey was conducted in the vicinity of the Paihia Visitor Information Centre, and in the wharf retail/tourist area, on 17-18 February 1997 (Monday and Tuesday), when 193 interviews were carried out. Again people were willing to participate. Locals were screened out early in the interview process.

3.3 Traffic Counts

Traffic counts were conducted at the Waipoua Forest site on SH12 during the survey to estimate the capture rate, and to assist comparisons between the before and after surveys. In both surveys the proportion of people surveyed to vehicles counted was around 40%.

4. ANALYSIS

4.1 Introduction

The responses from the after (1997) survey have been analysed and compared with the before (1994) survey results to identify any changes which have taken place in the time between the two surveys. These changes have then been examined to assess the degree of change, if any, which can be attributed to the sealing of the Waipoua Forest road.

Responses at Paihia and Waipoua have been analysed separately, but where appropriate these are shown in the same tables and figures to enable comparisons to be made.

4.2 Traffic Counts

Traffic volumes through the Waipoua Forest were significantly higher in the after (1997) survey than in the before (1994) survey. Most of the extra vehicles were cars. Anecdotal evidence suggests an increase in tourist activity over the last few years, and local businesses cite the road sealing as playing an important part in this increase. The traffic volumes by vehicle type counted during one day (Saturday, 19 February 1994; Saturday, 15 February 1997) of the before and after survey at Waipoua Forest are shown in Table 4.1.

Table 4.1 Traffic counts through Waipoua Forest for one day (Saturday) of the before (19/2/1994) survey and of the after (15/2/1997) survey, at Waipoua Forest.

Vehicle Type	Before survey 1994	After survey 1997	Increase	% Increase
Cars	94	145	51	54
Camper vans	14	15	1	7
Motor cycles	6	9	3	50
Bicycles	4	4	0	0
Trucks/Vans	13	21	8	62
Buses	5	10	5	100
Total	136	204	68	50

4.3 Country of Origin

Table 4.2 shows the country of origin for international visitors to Northland as captured by the surveys in 1994 and 1997. Total visitors to Northland obtained by the IVS are also shown for comparison. Australian visitors were the largest group of international visitors, followed by Europeans and British, in the IVS and before survey. The origins of New Zealand visitors are shown in Table 4.3.

4. *Analysis*

Table 4.2 Country of origin (as % of respondents) of international visitors to Northland, obtained from the before and after survey at the two sites, and the IVS.

Country	Before (1994) survey		After (1997) survey		Northland IVS	
	Waipoua	Paihia	Waipoua	Paihia	1991	1995/96
Australia	27	21	19	25	33	30
USA	11	11	12	6	14	16
UK	27	25	35	40	15	20
Germany	14	22	14	7	(1)	(1)
Canada	5	1	2	7	4	0
Europe other	0	0	10	12	23 ¹	20 ¹
Asia	0	0	4	2	11	6
Other	16	20	4	1	0	8
Total %	100	100	100	100	100	100

(1) Germany is included with Europe in the IVS.

Both the before and after Waipoua and Paihia surveys were reasonably representative of international visitors to Northland, although the UK visitors were over-represented and other European visitors were under-represented.

Table 4.3 Origin (as % of respondents) of domestic (New Zealand) visitors to Northland, obtained from the before and after survey at the two sites.

Region	Before (1994) survey		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Auckland	49	47	48	34
Northland	15	11	28	7
Other North Island	26	42	23	44
South Island	10	0	1	15
Total %	100	100	100	100

4.4 Origin and Destination

Waipoua Forest travellers, both northbound and southbound, were asked where they had started and planned to end their journey on the survey day. The results are shown in Table 4.4.

The main points of origin for northbound travellers were Auckland and Dargaville. However, the frequency of Auckland as an origin point was much lower in 1997 than in 1994. Paihia was the main destination for northbound travellers in both 1994 and 1997. The main origins for southbound travellers were Paihia and Opononi. Kerikeri reduced significantly in importance between the two surveys. The main destinations for southbound travellers were Auckland and Dargaville, with Auckland increasing and Dargaville decreasing in importance in the 1997 survey.

Table 4.4 Origins and destinations of Waipoua Forest travellers (% of respondents) through Waipoua Forest.

Northbound	1994	1997
<i>Origin</i>		
Auckland	50	23
Dargaville	30	37
Other	20	40
Total	100	100
<i>Destination</i>		
Paihia	40	41
Other	60	59
Total	100	100
Southbound		
<i>Origin</i>		
Paihia	35	34
Kerikeri	12	2
Opononi	12	19
Other	41	45
Total	100	100
<i>Destination</i>		
Auckland	40	55
Dargaville	30	9
Other	30	36
Total	100	100

4.5 Trip Purpose

Table 4.5 shows the trip purpose for respondents in the before (1994) and after (1997) surveys. In both surveys nearly all respondents were travelling for leisure purposes, with similar proportions travelling on work in each survey. However, there was a large difference at Waipoua in the make-up of leisure trips in 1997 compared to those in 1994 as the proportion on holiday had doubled, from 40% to 79% while the proportion on recreation had decreased from 54% to 14%. (Recreation trips were defined as day trips to undertake a particular recreation activity, holiday trips involve longer stays away from home.)

4. Analysis

Table 4.5 Purpose of trip (% of respondents) from the before and after surveys at the two sites.

Trip Purpose	Before (1994) survey		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Holiday	40	94	79	95
Recreation	54	3	14	2
Work	6	3	7	3
Total	100	100	100	100

4.6 Mode of Travel

Table 4.6 shows the mode of travel for respondents in the before (1994) and after (1997) surveys. The travel mode breakdown for respondents is similar to that observed in the 1994 DoC survey of Waipoua visitors.

Table 4.6 Mode of travel (% of respondents) from before and after surveys at the two sites.

Travel Mode	Before (1994) survey		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Private car	44	37	50	46
Camper van	7	10	7	5
Bicycle	1	0	0	0
Rental car	26	14	32	24
Bus	5	37	5	18
Motorcycle	15	1	2	0
Truck/Van	2	0	3	3
Air	0	1	0	2
Other	0	0	1	2
Total	100	100	100	100

4.7 Route Knowledge

Respondents were asked how much they knew about the condition of the Waipoua Forest road. In the before survey respondents were asked if they knew the road was unsealed; the after survey asked if they knew the road was fully sealed. The responses to this query in the two surveys are shown in Table 4.7.

Both in 1994 and 1997, people interviewed at Paihia had a higher degree of uncertainty in regard to the condition of the Waipoua Forest road than those interviewed at Waipoua. The level of knowledge about the road does not appear to have increased overall since 1994.

In the after (1997) survey Waipoua respondents, and Paihia respondents who had travelled via Waipoua, were also asked if the publicity about the road being improved had been a factor in their decision to use it. Of the respondents 66% had not seen any publicity and only 12% said it had made a difference in their decision. Around 28% of this group had previous knowledge about the route, but the remainder found out about it either through friends/fellow travellers (16%) or a combination of information from map/hotel-hostel information desk or tourist information centre.

Table 4.7 Knowledge of road condition (% of respondents) from the before and after surveys at the two sites.

Road Knowledge	Waipoua	Paihia-via Waipoua	Paihia-not via Waipoua
<i>Before (1994) survey</i>			
Knew road was unsealed	57	20	35
Didn't know road was unsealed	43	80	65
Total	100	100	100
<i>After (1997) survey</i>			
Knew road was sealed	45	29	21
Thought road was unsealed	18	9	16
Didn't know road condition	37	62	63
Total	100	100	100

4.8 Choice of Route

In the before (1994) survey respondents were asked if they had considered the fact that the Waipoua road was unsealed when choosing their route. Of those surveyed at Paihia, the people who had travelled via Waipoua said it was not a consideration, and 14% of those who would not be travelling via Waipoua said it was a consideration. Of those surveyed at Waipoua, 10% said it was a consideration in their choice of route.

The after (1997) survey asked respondents to indicate whether, if the route had been unsealed, this fact would have affected their choice of route (Table 4.8 shows the responses). Of the respondents at Waipoua, 28% said it would have affected their choice, and 72% that it would not. Of the respondents who answered this question at Paihia, 40% indicated that it would affect their route choice (this was only 21% of all Paihia respondents). Those who answered "Yes" to this question were then asked to indicate in what way their route choice would be changed.

Table 4.8 Effect of unsealed road on route choice (as % of respondents), obtained from after (1997) survey at the two sites.

Effect	Waipoua	Paihia
Definitely change route	5	2
May change route	2	3
Less comfort/enjoyment	2	1
Not used to unsealed road	3	1
Rental car not allowed	1	1
Depends on extent unsealed	1	1
Other	3	4
No effect on route choice	83	87
Total	100	100

4.9 Visitor Impressions of Route

All Waipoua respondents, and those Paihia respondents who had or were to travel through Waipoua, were asked what they liked, what attracted them, what they disliked or considered were disadvantages about the route through the forest. The responses are summarised in Tables 4.9 and 4.10 and give only general indications of the changes between the two surveys.

In both surveys the forest and scenery were the main attractions. However, in the after survey a number of respondents mentioned the condition of the road, and the sealing in particular as a good feature.

Poor road safety and road conditions were the main dislikes with the route in both surveys. However, the particular issues were different: in 1994 general road conditions (54%) and difficulties related to road sealing (28%) were the main problems, whereas in 1997 the problems were the winding road (17%), general safety (13%), and poor signage (13%) (percentages estimated from Table 4.10).

Waipoua respondents were asked whether they would recommend the route to friends who have not been to New Zealand. In the before survey 96% said they would with the scenery/environment being the main reason. In the after survey 98% would, with the scenery and Tane Mahuta as the main reasons.

They were also asked how they would describe this part of New Zealand to a friend. In the before survey 44% rated the area as "must see" and 53% rated it as "worth seeing". The after survey responses were 61% as "must see" and 38% "worth seeing". Overall the increase in the number who would recommend the area as a "must see" is clear and significant.

Paihia respondents who were not travelling via the Waipoua Forest were asked why they were not. The main reasons given in the after survey were: 32% didn't know about it; 25% had insufficient time; 13% will visit forest as a side trip; 10% had visited forest before. 1% (1 person) thought the road was still unsealed and indicated this as their reason for not using the route.

Table 4.9 Features liked about the Waipoua route, obtained from the before and after surveys (in number of responses from the two sites).

Feature	Before (1994) survey ⁽¹⁾		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Trees/Forest	35	25	43	47
Scenery general	86	16	46	11
Round trip	0	9	0	0
Good road	0	0	36	0
Other	10	7	44	11
Total	131	57	169	69

Table 4.10 Features disliked about Waipoua route, obtained from the before and after surveys (in number of responses from the two sites).

Feature	Before (1994) survey ⁽¹⁾		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Road conditions	41	10	0	0
Too winding	0	0	15	6
Safety (related to seal)	21	2	0	1
Safety (general)	10	0	11	0
Time	2	10	0	0
More traffic	1	0	4	0
Poor signage	0	0	11	1
Nothing	0	0	27	2
Other	1	29	19	4
Total	76	51	87	14

⁽¹⁾ 1994 survey figures represent more than one answer per respondent.
1997 survey figures represent one answer per respondent.

4.10 Reactions to Unsealed Roads

In the after survey Waipoua respondents were asked if they had travelled on the road before when it was unsealed, and, if so, would they use it more frequently now it is sealed. Respondents who had travelled over the route before accounted for 38%, and of these 37% indicated they now used the road more frequently than when it was unsealed because the road is now safer or better and is sealed.

4. *Analysis*

All respondents were asked, in both surveys, for their likes and dislikes about unsealed roads in New Zealand (more than one feature could be selected). The responses are summarised in Tables 4.11 and 4.12.

Table 4.11 Unsealed road features liked about the Waipoua Forest route, obtained from the before and after surveys (in number of responses from the two sites).

Feature	Before (1994) survey		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Adventure	6	2	59	2
Challenge	5	2	19	0
NZ experience	25	9	7	3
Fewer people	23	7	5	11
Total	59	20	90	16

Table 4.12 Unsealed road features disliked about the Waipoua Forest route, obtained from the before and after surveys (in number of responses from the two sites).

Feature	Before (1994) survey		After (1997) survey	
	Waipoua	Paihia	Waipoua	Paihia
Dust	39	22	105	11
Stones	27	25	57	10
Slow	25	23	34	9
Unsafe	20	18	13	4
Poor driving	7	0	3	1
Wear and tear	9	0	0	5
Corrugations	9	12	0	0
Total	136	100	212	40

The attitude towards unsealed roads was similar at Waipoua and Paihia for both surveys, being generally negative (dislikes outnumbering likes by a factor of 2 to 5). Several differences were noted between the two surveys: in the before survey unsealed roads appear to have been considered part of the "NZ experience"; this was much less the case in the after survey, when adventure was the predominant feature liked about unsealed roads. Dust and stones were the highest ranked "dislikes" in both surveys, with slow driving the next most unpleasant feature. Safety concerns appeared to be less of a concern in the after survey.

Respondents were also asked if they had any comments to make in regard to the importance of sealing unsealed sections of New Zealand's main road network. The response by country of origin is shown in Table 4.13 for the before survey, and in Table 4.14 for the after survey.

TOURISM BENEFITS FROM SEALING UNSEALED ROADS

In both surveys the majority of respondents saw benefits from road sealing, although only a minority considered it necessary to seal all roads. A higher proportion of international visitors than New Zealand residents considered that all roads should be sealed, and that sealing was important, particularly in regard to safety.

Table 4.13 Comments (from number of respondents separated according to country of origin) on sealing New Zealand roads obtained from the before survey, from the two sites combined.

Comment	NZ	Germ- any	UK	USA	Aust- ralia	Canada	Other	Total
All roads should be sealed	13	1	8	4	6	1	1	34
Roads would be safer if sealed	7	0	1	0	1	0	0	9
Unnecessary to seal all roads	4	3	0	1	4	0	2	14
Roads already to high standard	2	3	2	0	4	0	3	14
Nothing to do	7	2	4	1	0	0	1	15
Total	33	9	15	6	15	1	7	86

Table 4.14 Comments (from number of respondents separated according to country of origin) on sealing New Zealand roads obtained from the after survey, from the two sites combined.

Comment	NZ	Germ- any	UK	USA	Aust- ralia	Canada	Other	Total
All roads should be sealed	3	1	5	1	1	1	2	14
Roads would be safer if sealed	19	2	10	2	7	3	3	46
Unnecessary to seal all roads	6	4	3	0	2	2	4	21
Roads already to high standard	0	0	0	0	0	0	0	0
Nothing to do	0	0	0	0	0	0	0	0
Important to do	15	2	9	2	5	0	3	36
Seal main roads	10	1	6	0	2	0	3	22
More tourists use sealed roads	9	4	3	1	1	1	1	20
Seal for tourists	7	0	1	1	4	0	1	14
Total	69	14	37	7	22	7	17	173

5. CONCLUSIONS

5.1 Main Findings

The aim of this project was to assess changes in behaviour and attitudes of tourists to the Waipoua Forest area as a result of the sealing of the road. This assessment was always expected to be difficult to do given the probable small effects of the road sealing on tourist behaviour.

However, acknowledging this caveat, the level of tourist traffic on the Waipoua Forest road does appear to have been affected following the completion of the sealing of this road. The main findings are as follows:

- Traffic volumes through the Waipoua Forest have been increasing over the last few years as the road sealing programme has come to completion. In 1996 they increased by 20% above the traffic growth rate for the rest of Northland. However, analysis of traffic flows over several more years is required before it can be determined how much of this growth is attributable to road sealing.
- The number of all vehicles counted at Waipoua Forest increased by 50% from the before survey to the after survey.
- The purpose of trip for travellers passing through Waipoua Forest had changed significantly from the before survey to the after survey. For example the proportion on holiday had doubled over the 3 years, and the proportion of people on recreation trips had reduced accordingly.
- Of the Waipoua respondents in the after survey, 28% indicated that, if the route had not been sealed, it would have affected their choice of route. However, only 7% stated they would actually change their route. In the before survey, 14% of people who would not be travelling via Waipoua had indicated the road condition was a factor in their decision.
- The proportion of people who described Waipoua Forest as a "must see" area increased significantly from 44% in the before survey to 61% in the after survey.
- Of respondents in the before survey, 28% indicated that safety concerns related to road sealing were a feature they disliked about the Waipoua Forest route. By contrast, 21% of respondents in the after survey gave the condition of the road as one of the main features they liked about the route. The road-related dislikes were: too winding 17%, safety (general) 13%, and poor signage 13%.
- Of respondents in the after survey who had travelled the Waipoua Forest route before, 37% now used it more frequently because it was sealed and safer (14% of Waipoua respondents).

- The attitude towards unsealed roads was similar in both surveys, being generally negative with a small group having a positive concept of them (i.e. for the adventure). International tourists have a stronger preference for sealed roads than New Zealanders.

5.2 Summary

As outlined above, completion of the road sealing appears to have affected the attitudes and behaviour of tourists in regard to travelling the tourist route through Waipoua Forest. A higher proportion of tourists surveyed after sealing, than before sealing, considered the Waipoua Forest to be a "must see" area, and would encourage their friends/relatives to visit it.

In addition, they considered the road condition to be good, which compares with a significant level of negative feeling about the road before sealing. Use of the Waipoua Forest road has increased significantly following completion of the sealing programme, and local tourist operators report increased levels of tourist activity after the sealing programme had been completed.

On the basis of this research, therefore, it can be asserted that sealing unsealed roads will have some effect on the levels of road use by holiday makers, both domestic and international. However, the actual effect on international tourist holiday plans cannot be determined solely from this research.

5.3 Future Research

When the research project was initially conceived it was expected that the first after survey would be conducted shortly after sealing was complete, and that a second after survey would be needed once awareness of the road improvements had been established. The timing of the completion of the sealing programme meant almost a one-year gap between completing the sealing and undertaking the survey. During this time there has been wide publicity about the road. This meant that most people travelling or giving advice to travellers were aware that the road was sealed by the time the first after survey was undertaken.

Conducting a second after survey is thus not likely to provide any new insights into the effects of road sealing on tourist behaviour. This research has shown that sealing important tourist routes will most likely increase the numbers of tourists using those roads. However, it has not provided clear evidence of this effect on the length of stay, or on the number of international visitors coming to New Zealand. Appendix 1 brings together evidence from several studies on this topic.

5. *Conclusions*

Further research should focus on examining the nature and strength of the relationship between road sealing and tourist behaviour. In view of this, rather than a second after survey, it may be more productive to undertake further research in the following areas:

- Research to determine the relative weighting attributed by tourists to sealed/unsealed roads, and the impact of this on their behaviour. This research would ask respondents to indicate their most likely behaviour within certain scenarios. This would require them to "trade off" relevant travel decision-making variables. Semi-structured face-to-face interviews of tourists, with an element of conjoint analysis, would be most appropriate. In this regard, interviewing overseas visitors at airport departure lounges has been trialed and found to produce good results.
- Research to determine the impact of sealing the Waipoua Forest road on inbound tour companies. This would add to the depth of knowledge about the effects of the Waipoua Forest road sealing, and provide data on observable changes in tourist activity: a telephone interview would most likely be adequate. However, a survey of tour operators alone would not be adequate as it would not explore the reasons behind tourists' decisions.
- The change in traffic volumes through the Waipoua Forest, and in Northland generally, should continue to be monitored to ascertain whether the recent traffic increase on SH12 is sustained.

APPENDIX 1
EFFECTS OF ROAD SEALING ON
TOURIST VISITS & EXPENDITURES

APPENDIX 1. EFFECTS OF ROAD SEALING ON TOURIST VISITS & EXPENDITURES

A1.1 Introduction

In the early 1990s the then Transit New Zealand, in conjunction with the New Zealand Ministry of Tourism, began several projects to investigate the scope and size of benefits from tourism by sealing unsealed roads. These were initiated in response to the belief in some quarters that the Transit New Zealand project evaluation procedures did not appropriately take into account these benefits. In particular, they did not take into account additional expenditure in New Zealand by international tourists arising if they are more likely to visit and/or to stay longer in the country because the roads in tourist areas have been improved by sealing.

All of these projects have now been completed. This appendix summarises the findings of these projects (along with the findings of related Australasian research), and presents overall conclusions in regard to the scope and size of tourism benefits arising from sealing unsealed roads.

A1.2 Summary of Research

Tourism Benefits From Sealing Roads: User Survey of Milford Sound Road. 1993. *Transit New Zealand Research Report 45.*

This project aimed to use the effects of sealing the Milford Sound Road as a case study to investigate tourism benefits from sealing unsealed roads. The project involved a study of traffic flows into Milford Sound, Queenstown and the West Coast to determine any discernible trends in tourist activity, and a survey of selected tourist operators.

The main findings were:

- Traffic growth on the Milford Sound road has shown a steady increase but with no evidence of any change in that trend since the road was sealed.
- Interviews with local tourist operators in Te Anau identified the main effect of the sealing to be a shift from independent travellers using bus to using car, and fewer visitors staying two nights at Te Anau. Bed nights have nevertheless continued to increase in total. Overall, sealing was not considered to have affected the number of visitors to Milford Sound.
- Sealing the road improved the travel experience for tourists (the journey was now faster, more comfortable and safer), which could in principle be expected to lead to an increase in tourist numbers and hence tourist expenditure in New Zealand. However, it was not possible to isolate these effects from those of other factors affecting tourist numbers and expenditure.

This project was terminated before detailed surveys were undertaken. The pilot study concluded that evidence of any increased expenditure resulting from the road improvement would be swamped by the impact of other factors affecting tourism patterns.

South Westland Heritage Highway: Demand Assessment Aspects. 1993 - 1994.

Although not a Transit-sponsored project, this study for the Westland and Southland District Councils is relevant in that it assessed the impact of a major improvement in transport infrastructure on tourist activities.

The project aimed to provide an assessment of the likely usage and revenue which would arise from the proposed West Coast Heritage Highway, operating as a Toll Road. The project involved analysis of present traffic levels and international tourist levels; survey of independent travellers in Queenstown and Milford Sound; and survey of a range on inbound tour operators.

The main findings were:

- Tour operators did not see the new road in itself generating additional international visitors to New Zealand, although some claimed it was essential if planned visitor targets were to be met.
- Tour operators currently providing West Coast tours are almost certain to change their tours to incorporate the new road (at assumed toll levels).
- The road would encourage tour operators to provide the added attractions of a West Coast tour without the extra time and kilometres which currently add \$100-\$150 to the price of such a tour. Therefore a switch towards tourist circuits incorporating the West Coast and using the new road would be likely.
- The new road is likely to make visiting the West Coast a more viable option for both independent travellers and tour patrons.

Overall, the conclusion was that the improved infrastructure would lead to tour operators (and independent travellers) incorporating more attractions within the same time/cost. While this is a clear benefit for the tourist (and in this case, the West Coast), it is not necessarily a benefit for New Zealand.

It is reasonable to expect that if the satisfaction and enjoyment of tourists to New Zealand increases, an increase in visitor numbers will result (primarily) from word of mouth advertising.

Long Term Tourism Roothing Task Force: Visitor Expectation Survey. 1994.

In 1993 the Ministry of Commerce and Transit New Zealand established a Long Term Roothing Task Force (LTRTF) to investigate future tourism demands on road transport and to assess the policy and planning implications. As part of its work the LTRTF commissioned a survey of international visitors to investigate their holiday experiences and expectations, and whether, and to what extent, improving the New Zealand road system is likely to result in increases in the level of international tourism to New Zealand. This survey was conducted at airport lounges in Christchurch and Auckland. It was intended as a pilot survey, and only 48 interviews were conducted from which it appeared that the respondents primarily travelled on sealed roads. It was subsequently decided not to progress with the main survey.

The main conclusions from the pilot survey were:

- Reactions to the New Zealand road system were generally positive.
- Six of the respondents said that their experience of the New Zealand road system would be a positive factor in their returning. For the other 42, their experience would not be a factor in their decision to return to New Zealand.
- Visitors' choice of mode of transport and areas visited was, in some cases, related to the quality of the road system. Some people disliked driving in New Zealand and would therefore use other modes (coaches etc.) on a future visit, which would influence the places they went to. In other cases people would use a car on a future visit, and thus see more places. There was little (if any) evidence that the road system would influence a person's length of stay in New Zealand.

Overall, it appears that the state of the New Zealand road system is a relevant (but modest) factor for some international visitors in their decision to return to New Zealand, and their mode of travel while in the country. This will also affect whether they might encourage their friends or relatives to visit New Zealand. It does appear likely therefore that some relationship exists between the state of the road system and the number of international visitors.

Tourism Benefits From Sealing Unsealed Roads: Perceptions Of Discomfort and Risk. 1997. *Transit New Zealand Research Report 81.*

This project aimed to investigate motorists' perceptions of discomfort and risk associated with using unsealed roads in New Zealand, and the extent to which such factors were not included in the project evaluation procedures used by Transit New Zealand. The project involved an international literature search; focus group discussions with international tourists and domestic travellers; roadside surveys on three unsealed roads; and a survey of motorists.

The relevant findings were:

- Motorists place substantial values on discomfort and risk factors associated with the use of unsealed roads (relative to sealed roads). These factors were not incorporated in the current evaluation procedures.
- The average values obtained were equivalent to increasing the unit value of travel time savings by 25-50% for unsealed roads relative to sealed roads.
- No apparent difference was found between valuations of New Zealand drivers compared to drivers from overseas.

The most interesting conclusion from this research is that tourists, by and large, value discomfort and risk similarly to domestic travellers. As noted above, there is no evidence of how this affects tourist expenditure or visits.

Waipoua Forest Survey. 1994 - 1997.

Transit New Zealand Research Report No. 86 (this report)

This project involved conducting a before survey and an after survey around the completion of Transit New Zealand's sealing programme on SH12 through the Waipoua Forest in Northland. The project aimed to determine any changes in tourist behaviour and attitudes in relation to the route through the Waipoua Forest as a result of the sealing of the road. Personal interview surveys were conducted at both Waipoua Forest (at the parking area to Tane Mahuta) and at Paihia.

The main findings were:

- Traffic volumes through the Waipoua Forest (as measured by Transit New Zealand's AADT statistics) have increased significantly (50%) since the completion of the road sealing programme. Figures available to date indicate a growth in 1996 of around 20% above the trends elsewhere in Northland.
- Traffic volumes counted on one survey day at Waipoua were 50% higher in the after survey than in the before survey (although this increase may not be representative as counts were only undertaken for part of a day).
- The traveller mix has changed significantly: the percentage of respondents on holiday, as distinct from those on a recreation trip, doubled between the before survey and the after survey, increasing from 40% to 80% of respondents.
- The proportion of respondents who rated this part of New Zealand as "must see" increased from 44% in the before survey to 61% in the after survey.
- A small proportion (7%) of respondents at Waipoua in the after survey indicated that they would have changed their route if the road had not been sealed. In the before survey 14% of people who did not travel via Waipoua had indicated the road condition was a factor in their decision.

Appendix 1

- 35% of respondents in the after survey gave the condition of the road as one of the main features they liked about the route. 28% of respondents in the before survey had indicated road seal-related safety concerns were a feature they disliked about the Waipoua route.
- 37% of respondents in the after survey who had already travelled the Waipoua route indicated they now used it more frequently because it was sealed and safer.
- The attitude towards unsealed roads was similar in both surveys, being generally negative with a small group having a positive concept of them (i.e. for the adventure). International tourists have a stronger preference for sealed roads than New Zealanders.

This study did find a significant increase in the appreciation of the Waipoua route which can be directly attributed to the road sealing. Furthermore, the increase in visitors rating the area as "must see" can be expected to cause an increase in the number of international visitors who include Northland in their itineraries.

To some extent, increasing visitors to Northland will be at the expense of other regions. However unlike Milford, which is already a "must see" on most tourists' itineraries, Northland is currently not featured on shorter itineraries. Increasing the number of places that tourists want to see (and, in this case, increasing their geographic spread) is likely to create a demand for longer stay tours. Increasing the diversity of attractions can also be expected to increase the number of people attracted to New Zealand.

Quantifying Tourism Economic Benefits and Evaluation of Road Projects. 1992. *Institute of Transport Studies.*

This report provided a comprehensive literature review and discussion of the issues involved in the evaluation of tourism benefits of roading projects. Key points which were not covered by other research were:

- Safety related to unsealed roads is often an issue raised by tourists.
- Benefits that tourists are likely to value, that are not measured by current evaluation procedures, include the value of a more comfortable ride, reductions in dust coverage and better views.
- Valuations for travel time savings by tourists are typically very low.

Evaluation of Roadworks - Principles and Procedures. 1974.
Commonwealth Bureau of Roads.

This report discusses the treatment of benefits to generated traffic for major road projects focusing on evaluation procedures. A survey of travellers on the Eyre Highway was conducted in 1972 and the main findings were:

- Values of comfort benefits to passengers were estimated for upgrading different road surfaces to seal.
- An elasticity of traffic growth with respect to sealing of 0.55 was derived: with the benefits to generated traffic being valued at half of the rate of benefits to existing traffic.

Origin and Destination Survey - Eyre Highway at Norseman. 1978, 1980.
Western Australia Main Roads Department.

This report summarises the results of vehicle travel surveys on the Eyre Highway in Western Australia to investigate the changes in traffic resulting from sealing the road. The report concludes that:

*... although the trend since the completion of the sealing is a little unclear
... it appears that a higher standard of road linking two regions could
generate a 50% increase in demand following the completion of the link....*

However, the traffic count data suggest that there was a one-off surge in traffic volumes following completion of the sealing (in 1976), but that the traffic increase after the first two years was considerably less than the 50% suggested.

A1.3 Conclusions

From this summary of research projects related to benefits to tourists by sealing unsealed roads and the consequences for visitor numbers, length of stay and expenditure, the main conclusions are:

- Sealing unsealed roads provides a real improvement in the travel experience of international visitors in New Zealand. International visitors place a similar value as New Zealanders on this benefit.
- The evidence is that improvements in the road system will tend to increase visitor numbers to New Zealand, both by encouraging return visits and by word-of-mouth to potential visitors. However, the evidence is insufficient to quantify the strength of this relationship.

Appendix 1

- Sealing unsealed roads appears to have generated additional tourists to some areas (Waipoua), but not to others (Milford). We conclude that it is most likely to increase visitor numbers and expenditure where it introduces new attractions rather than makes visiting existing attractions easier.
- Sealing unsealed roads is likely to change the types of tourist holiday packages provided, and the travel modes used in different areas.

