

The Economic Impact of Tourism on Christchurch City and Akaroa Township

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This kind of research can only be carried out if those in the tourism industry, particularly the accommodation sector who provide the data for the Commercial Accommodation Monitor, provide comprehensive information. These data are valuable and we acknowledge the time and effort taken by tourism operators. The research also relies very heavily on the goodwill of visitors who are surveyed to provide information about their spending patterns while on holiday. We record here our thanks for their generally very cheerful assistance in providing information. We also wish to thank the team of interviewers for their willingness to accept the stress of field interviews. Without them, this work is impossible.

We hope that this report will lead to greater public understanding of the role of tourism in the Christchurch and Akaroa economies, and that this in turn will help the industry and thus in some measure repay respondents for their assistance. More importantly, perhaps, is that we hope the survey framework reported here can easily be replicated in other centres which want a cheap and moderately reliable method of estimating the economic impact of tourism on their economies.

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Summary

Christchurch

Approximately 11,000 persons (Full Time Equivalent - FTE), on average over the year 2002, were employed directly in tourism in Christchurch. Many more people work in businesses which are primarily dependent on tourism, but their number has to be adjusted down to reflect the part time and seasonal nature of the work, and the fact that many businesses sell only part of their turnover to tourists.

Every job in tourism leads, on average, to a further 0.46 jobs elsewhere in the Christchurch economy, increasing employment by 5,070 FTEs to a total of 16,070 FTEs. This excludes any jobs in social services (such as teaching) that might be lost if tourism (and hence employment) declined, and people emigrated from the district. Total employment in Christchurch averaged over the 2002 year is estimated to be around 130,000 FTEs so that the direct employment in tourism is eight per cent and the indirect employment is four per cent.

Total direct spending by tourists in Christchurch is estimated to be \$1,103 million in the 2002 year¹. This direct spending figure is based on a survey of visitor spending per visit for day visitors and per night for overnight visitors, with the spending then being rated up according to the total number of visitors as documented by the international visitor Survey (IVS), the Domestic Tourism Monitor and the Commercial Accommodation Monitor. Flow-on effects of visitor spending increase total visitor-dependent output in Christchurch to an estimated \$1,935 million.

Value-added² in Christchurch arising directly from tourist spending is estimated to have been \$376 million in 2002 (including \$244m of household income). The flow-on effects of visitor spending increase total visitor-dependent value added to \$744 million (including \$442m of household income), a multiplier of 1.81. This high level of flow-on impacts reflects the diversified nature of the Christchurch economy, which provides the majority of both manufacturing and business support services for the tourism businesses in the City. The proportional flow-on effect is **two to three** times the flow-on effects of Kaikoura and Westland, and **more than double** that which occurs in Rotorua, with these centres having much less diversified economic bases.

The above estimates are based on IVS data showing 3.97 million international visitor-nights per year in Christchurch. However, there are alternative data which suggests about 0.74 million (19%) fewer visitor-nights per year, with the reduction largely confined to non-commercial accommodation by lower-spending visitors. If these lower figures are correct, then the total economic impacts of domestic and international tourism in Christchurch will be some seven per cent less than has been estimated in this paper.

1 Generally, output refers to sales. In some contexts retail trade "output" refers only to the gross margin, not the gross value of sales. However, in this report "output" is used synonymously with turnover.

2 This is the total of returns to land, labour and capital. Hence it includes wages and salaries, income of the self-employed, rents on land profits, and depreciation of capital.

Summary Table 1
Summary of Economic Impacts of Tourism in Christchurch

	Direct Impacts	Multipliers (Type II)	Total Impacts
Output (\$m)			
Accommodation	152	2.00	303
Travel	142	2.17	307
Restaurants & Cafes	302	1.82	550
Activities	114	1.94	221
Retail	340 (110)*	2.02	452
Other	53	1.88	101
Total	1,103	1.75 (implied)	1,935
Employment (FTEs)			
Accommodation	2,390	1.36	3,250
Travel	1,010	2.13	2,140
Restaurants & Cafes	4,720	1.30	6,150
Activities	730	1.96	1,430
Retail	1,530	1.45	2,220
Other	590	1.49	880
Total	10,970	1.46 (implied)	16,070
Value-added (\$m)			
Accommodation	50	2.25	112
Travel	61	2.28	139
Restaurants & Cafes	133	1.78	239
Activities	52	1.97	103
Retail	54	1.95	106
Other	24	1.88	45
Total	376	1.98 (implied)	744
Household Income (\$m)			
Accommodation	39	1.83	71
Travel	38	2.11	81
Restaurants & Cafes	82	1.68	139
Activities	27	2.06	54
Retail	44	1.64	73
Other	14	1.79	25
Total	244	1.81 (implied)	442

*The first figure is sales, the second figure in brackets is gross margin, and it is the latter figure to which the multiplier is applied to establish the indirect and induced effects.

Akaroa

Approximately 160 persons (Full Time Equivalent - FTE), on average over the year 2002, were employed directly in tourism in Akaroa. Significantly more people in Akaroa work in businesses which are primarily dependent on tourism, but some of the employment is part time, the industry is seasonal, and many businesses sell only part of their turnover to tourists.

Every job in Akaroa tourism leads, on average, to a further 0.15 jobs elsewhere in the Banks Peninsula District economy, but probably only half of those are created in Akaroa. Hence total tourism-dependent employment in Akaroa is around 172 FTEs. This total excludes any jobs in social services (such as teaching) that might be lost if tourism (and hence employment) declined, and people emigrated from the District. Total employment in Akaroa as measured in the 2001 census was around 261 FTEs, and on average over 2002 it was probably closer to 300. Hence about half of all jobs in the Township depend either directly or indirectly on tourism.

Summary Table 2
Summary of Economic Impacts of Tourism in Akaroa

	Direct Impacts	Multipliers (Type II)	Total Impacts
Output (\$m)			
Accommodation	3.39	1.13	3.81
Travel	0.34	1.25	0.42
Restaurants & Cafes	4.22	1.11	4.68
Activities	4.51	1.16	5.21
Retail	3.86 (1.05)	1.13	4.00
Other	0.95	1.14	1.08
Total	17.3	1.11 (implied)	19.2
Employment (FTEs)			
Accommodation	54	1.05	56
Travel	2	1.27	3
Restaurants & Cafes	66	1.04	69
Activities	15	1.12	19
Retail	15	1.06	16
Other	9	1.13	10
Total	160	1.08 (implied)	172
Value-added (\$m)			
Accommodation	1.12	1.17	1.30
Travel	0.14	1.25	0.19
Restaurants & Cafes	1.86	1.08	2.07
Activities	1.94	1.17	2.28
Retail	0.51	1.07	0.59
Other	0.41	1.14	0.47
Total	6.0	1.15 (implied)	6.9
Household Income (\$m)			
Accommodation	0.88	1.08	0.95
Travel	0.09	1.25	0.11
Restaurants & Cafes	1.14	1.08	1.23
Activities	1.08	1.17	1.28
Retail	0.42	1.07	0.45
Other	0.24	1.13	0.27
Total	3.9	1.11 (implied)	4.3

Total direct spending by tourists in Akaroa is estimated to have been \$17.3 million in the 2002 year. This direct spending figure is based on a survey of visitor spending per visit for day visitors and per night for overnight visitors, with the spending then being rated up according to the total number of visitor nights in commercial accommodation as documented by the Commercial Accommodation Monitor, and the number of day visits and visitor-nights in non-commercial accommodation being estimated on the basis of ratios between these various groups as revealed in the visitor survey. Flow-on effects of visitor spending increase total visitor-dependent output in Akaroa to an estimated \$19.2 million in 2002.

Value-added³ arising directly from tourist spending is estimated to be \$6.0 million (including \$3.9m of household income). The flow-on effects of visitor spending increase total visitor-dependent value-added in Akaroa Township to \$6.9 million (including \$4.3m of household

³ This is the total of returns to land, labour and capital. Hence it includes wages and salaries, income of the self-employed, rents on land profits, and depreciation of capital.

income). The value added multiplier in Akaroa at 1.15 is even less than those for Kaikoura (1.38) and Westland (1.19). This low multiplier reflects the undiversified nature of the Akaroa economy, which only provides limited servicing support for the tourism businesses in the Town, and the relatively short distance from the major centre of Christchurch.

The impacts reported in the Summary Tables arise from the on-going operation of existing tourist facilities. In addition to these are impacts arising from capital injections into the industry (that is, injections additional to ongoing repairs and maintenance - which tend to include minor capital works). Capital expansion in any given year depends on the level of capacity utilisation and the size of the industry base. There is no data series on capital expenditure in tourism, but it is not believed to have been particularly significant in Christchurch in recent years, primarily because of the long-developed nature of the industry and the spare capacity in accommodation. However, ongoing growth in visitor arrivals and expenditure may lead to more significant capital expenditure in the near future.

Christchurch, in spite of the very high level of visitor numbers and visitor-nights, is the least dependent tourism centre we have studied so far. This reflects the highly diverse nature of its economy and the fact that it has a major manufacturing base and also supports other primary industries such as farming. Thus the very features which lead to Christchurch having a high tourism multiplier are also the features which lead to tourism being a fairly modest part of the City economy.

Akaroa, by contrast, has the lowest tourism multipliers but is the most tourism-dependent centre of those we have so far studied. Major growth or a significant decline in tourism would both have very significant effects. Major growth implies the need for increases in infrastructure to cater both directly for the visitors and also for those who work in the industry and reside in the area. It also implies the need to manage the resources available to visitors so that the qualities which entice visitors to Akaroa are not compromised or lost. A major decline in tourism could well lead to high levels of localised unemployment and, conceivably, a major loss in value for those operators who run tourism businesses.

Chapter 1

Research Objectives and Overview of Tourism's Role in the Christchurch and Akaroa Economies

1.1 Introduction

In recent years tourism has been one of the fastest growing sectors of the New Zealand economy, and has become particularly important in some smaller communities. Some of the larger cities also have high visitor numbers, and tourism may be a reasonably significant part of their economy. Those who administer community resources have a strong interest in knowing something about the scale of tourism in their economy so that they can judge the value of allocating resources to the sector. Resources can be applied in numerous ways including infrastructure provision, marketing, training and planning for the effects of tourism.

Casual observation suggests that tourism is a significant part of the Christchurch economy and a very major contributor to the economy of Akaroa. However, it is uncertain just how important the industry is, both in terms of its direct impacts and also its indirect impacts⁴. The first objective of this study was to estimate the size of direct tourism in Christchurch and Akaroa⁵, and then calculate tourism multipliers (the ratio of direct impacts to total impacts for various types of visitor expenditure) at the level of each geographic entity. Application of these multipliers enables the calculation of total economic impacts of tourism on both Christchurch and Akaroa.

Many local authorities face the same issues as Christchurch and Akaroa, and need some reasonably simple and cost-effective way of estimating the value of tourism to their community. The second objective of this study was to develop and trial such a method, drawing on the experience of previous case studies and making use of existing data bases on commercial accommodation bed-nights and visitor flows⁶.

Regional economic models and the multipliers derived from them can be generated using a national production function and modifying the input coefficients to reflect average regional self-sufficiency in the various input industries. This approach presumes that input structures for a given industry are the same in different regions. By contrast, survey-based analysis establishes the input structure (type and origin) of the industries in question (in this case, tourism industries) in the particular region. Earlier research in other small centres has demonstrated that national and regional tourism production functions do differ, sometimes significantly, and hence that surveys of business spending may lead to significant differences in multipliers (Butcher *et al.*, 1998, 2000, 2002). However, the differences are not so large as to alter the broad conclusions of analysis. This is partly because tourism consists of a large number of enterprises operating in diverse industries, and errors in any particular industry tend to be offset by errors in another industry. It is also because the multipliers, particularly in small centres, are likely to be quite small (1.2 – 1.3) and it is much more important to improve the accuracy of estimates of direct visitor spend than to improve estimates of tourism multipliers. Non-survey multipliers generate sufficiently accurate results for policy prescriptions and planning decisions which are unlikely to

4 These indirect impacts arise from the spending by tourist businesses and their employees at other businesses. For example, a boating company buys fuel, and hotel employees buy groceries for personal consumption. For a fuller discussion refer page 8.

5 Akaroa was chosen as a peripheral centre with a very high dependence on tourism.

6 The earlier studies include Butcher *et al.*, (1998), Butcher *et al.*, (2000) and Butcher *et al.*, (2001).

be affected by use of the more precise production functions and multipliers generated by time-consuming and expensive surveys of regional tourism businesses. It became apparent during the estimation of Christchurch economic impacts that there is major uncertainty about the total number of visitor nights in Christchurch. It would be more useful to improve the accuracy of this number, which underlies the estimates of direct impacts, than to improve the accuracy of the multipliers which rate up this number. Notwithstanding this general claim, the methods used in this study have evolved and those changes need to be described before reviewing employment in Christchurch and Akaroa.

1.2 Research Method

Estimates of direct visitor expenditure per day can be derived from existing surveys of domestic and international visitor spending⁷, but earlier studies⁸ have demonstrated that the international visitor survey (IVS) data, representing only broad average per day expenditure across the Country, is not particularly accurate as regards to any particular region. The survey sample size for International Visitors is around 6,000 per year, but even surveying on this scale means that data on visitor numbers for small destinations is still weak, and there is no attempt to estimate spending in any particular geographic areas.

The number of respondents involved in the Domestic Travel Monitor (DTM) was such that the number of respondents who reported visits to small destinations was quite low. Even in places such as Akaroa, which has moderate visitor numbers, there were only 40 respondents reported visiting in 1999 and 2000, and 25 respondents in 2001. Combining data from successive years⁹ improves the sample reliability, but the data are still unreliable for small centres and as part of this research project we compared estimates of visitor numbers from various data sources.

In the light of these data limitations, it became necessary to calculate the direct expenditure by alternative methods. In earlier work in Kaikoura, Rotorua and Westland we estimated direct employment in tourism activities by undertaking a census of employment in relevant businesses. We then combined these estimates with data on employment with output ratios to calculate the output of tourism activities. This approach was simply not practical in the context of Christchurch. The number of businesses is so large that a census is not possible within the scope of the research budget, and in any case staff would generally have no idea of whether or not the customer was a visitor to Christchurch. Instead we used an alternative process which involved surveying visitor spending and visitor type¹⁰ in both centres, and combining this with data on bed-nights from the Commercial Accommodation Monitor to estimate the population of visitor numbers of each type. We then crosschecked the results against estimates of international visitor-nights from the IVS and domestic visits and visitor-nights from the DTM, and adjusted where this seemed appropriate. While a census approach would have been practical in Akaroa, we decided to use the same estimation process in Akaroa as in Christchurch in order to see how reliable the results are for a small centre and how easy the process was to apply.

7 The International Visitor Survey (Tourism New Zealand; www.tourisminfo.govt.nz) and the Domestic Tourism Monitor (Forsythe, 2000). From February 2003 tourism data can be accessed via www.trcnz.govt.nz.

8 See Butcher *et al.*, 1998, 2000 and 2001.

9 Three years of data are now available from the "Domestic Tourism Monitor" (undertaken by Forsythe Research for Foundation for Research Science and Technology). The total sample size has thus increased and the results are more reliable.

10 Day trip or overnight stay, whether overnight stays were in commercial accommodation, and domestic or international visitor.

1.3 Employment in Christchurch City and Banks Peninsula District (2001)

The 2001 census shows that at March of that year, total employment in Christchurch City and Banks Peninsula District was around 132,400 and 3,600 FTEs¹¹ people respectfully. Employment growth from 1991 – 1996 in the two regions was 17 per cent and 20 per cent respectively, and in the period 1996 – 2001 the growth slowed but was still six per cent and nine per cent in the two regions. Table 1 shows employment by sector for three recent census years, while Table 2 shows the proportion of employment in each industry group in Christchurch, Banks Peninsula and also Akaroa. The 2001 data for Akaroa and Christchurch is according to place of work rather than place of residence, and the two numbers differ according to the level of commuting in or out of the location.

Table 1
Employment (Full Time Equivalent) by Sector, 1991 – 2001

Sector	Christchurch				Banks Peninsula			Akaroa
	1991	1996	2001		1991	1996	2001	2001
	Reside	Reside	Reside	Work	Reside	Reside	Reside	Work
Agriculture ⁴	1,890	2,412	1,872	1,164	474	438	378	15
Forestry	54	135	132	53	6	15	21	0
Fishing & Hunting,	63	90	93	30	42	24	15	0
Mining	48	54	75	77	6	6	0	0
Food Manufacture	3,813	4,107	3,594	3,602	54	42	45	0
Wood & Paper Products	2,448	2,658	1,410	1,431	36	45	27	0
All other manufacturing	15,225	16,644	17,103	17,830	237	267	297	12
Electricity, Gas & Water	342	504	390	392	12	15	9	0
Construction	6,639	7,632	8,181	6,161	147	156	174	12
Wholesale & Retail Trade	19,806	22,101	25,290	25,165	348	402	459	51
Restaurants	2,874	4,452	4,461	4,240	93	135	138	39
Accommodation	1,752	2,196	2,235	2,243	81	123	117	42
Air Transport	1,380	1,536	3,474	3,496	18	15	63	0
Transport	4,647	5,319	3,045	2,312	258	228	171	6
Communications	2,610	2,229	2,139	2,086	48	36	24	0
Business & Prof. Services	13,422	15,219	19,383	18,662	195	282	456	18
Recreation & Cultural Serv	1,992	2,817	3,096	2,937	75	81	108	12
Health & Education	15,495	16,377	18,159	17,997	335	438	504	36
All other services	12,984	13,359	12,600	12,221	252	279	318	24
Not identified	0	5,742	5,736	1,416	0	222	216	3
TOTAL FTEs								
Change since last census	107,391	125,541 +17%	132,447 +6%	123,485	2,682	3,228 +20%	3,516 +9%	261

Notes:

1. Census numbers are produced on the basis of place of residence and place of work. The above data are for the place except for 2001 when place of residence and place of work are noted.
2. Numbers may not add due to rounding

¹¹ Full Time Equivalents – see later definition.

The major sources of employment in Christchurch are wholesale and retail trade, business and professional services, health and education and other services. Manufacturing in total provided only 13 per cent of total employment. There was not a marked change between 1991 and 2001. The share of employment in manufacturing declined slightly and the share in services, particularly business and professional services, increased.

The major sources of employment in Banks Peninsula were agriculture, wholesale and retail trade, business and professional services, and health and education. There were significant changes between 1991 and 2001, with agriculture's share of employment declining rapidly and professional and business services increasing rapidly. In Akaroa in particular, employment in the sectors servicing tourism are particularly strong, with accommodation and restaurants generating 30 per cent of total employment and retailing being responsible for a further 20 per cent.

Table 2
Employment Share by Sector (%), (1991 and 2001)

Industry	Christchurch		Banks Peninsula		Akaroa
	1991	2001	1991	2001	2001
Agriculture	1.8	1.4	17.7	10.8	5.7
Forestry	0.1	0.1	0.2	0.6	0.0
Fishing & Hunting	0.1	0.1	1.6	0.4	0.0
Mining	0.0	0.1	0.2	0.0	0.0
Food Manufacture	3.6	2.7	2.0	1.3	0.0
Wood & Paper Products	2.3	1.1	1.3	0.8	0.0
All Other Manufacturing	14.2	12.9	8.8	8.4	4.6
Electricity, Gas & Water	0.3	0.3	0.4	0.3	0.0
Construction	6.2	6.2	5.5	4.9	4.6
Wholesale & Retail Trade	18.4	19.1	13.0	13.1	19.5
Restaurants	2.7	3.4	3.5	3.9	14.9
Accommodation	1.6	1.7	3.0	3.3	16.1
Air Transport	1.3	2.6	0.7	1.8	0.0
Transport	4.3	2.3	9.6	4.9	2.3
Communications	2.4	1.6	1.8	0.7	0.0
Business & Prof. Services	12.5	14.6	7.3	13.0	6.9
Recreation and Cultural Services	1.9	2.3	2.8	3.1	4.6
Health & Education	14.4	13.7	12.5	14.3	13.8
All Other Services	12.1	9.5	9.4	9.0	9.2
Unidentified	0.0	4.3	0.0	6.1	1.1
Total	100.0	100.0	100.0	100.0	100.0

1.4 Capital Growth and Infrastructure Demands

Akaroa is facing significant infrastructure costs, some of which are related to tourism (e.g. remodelling the waterfront area, expanding sewage treatment and water supplies). No investigation of the scale or impact of this is made during this study, but the effects of tourism on

demands for water supply and waste water treatment are contained in another report in this series¹².

1.5 Report Structure

Chapter 1 of this report discusses the objectives of this study and outlines the place of tourism in the Christchurch and Akaroa economies. Chapter 2 describes the research methods used to estimate the significance of tourism, and describes the survey undertaken in this research project. Chapter 3 reports our estimates of direct tourism impacts and Chapter 4 reports on the multipliers derived for Christchurch and Banks Peninsula tourism and hence the indirect impacts of tourism on these economies. Chapter 5 brings the earlier results together to estimate total impacts of tourism on the Christchurch and Akaroa economies. Appendix 1 outlines a relatively simple and low-cost process whereby other Territorial Local Authorities can estimate the significance of tourism to their region.

12 Cullen, R., Dakers, A., McNicol, J., Meyer-Hubbert, G., Simmons, D. and Fairweather, J. (2003) Tourism, Water and Waste in Akaroa: Implications of tourist demand on infrastructure. (TRREC Report No. 38/2003.)

Chapter 2

Theory and Research Method

2.1 Introduction

This chapter contains definitions of terms used in this report, a summary of the way in which both regional economic tables were developed and multipliers were calculated, and details of the surveys undertaken to get the data necessary to estimate direct expenditure by visitors. The section on the theory of economic impact models is brief, and assumes the reader has some prior understanding. Those who wish to know more should consult one of the numerous texts on the subject¹³.

2.2 Definitions

Employment

Employment is work done by employees and self-employed persons, and is measured in Full-Time-Equivalent jobs (FTEs). A person working part time all year is deemed to be equivalent to 0.5 FTEs.

Where work is seasonal, the conversion to FTEs is based on 12 months work per year and 35 hours per week. So a seasonal worker working full time for six months per year is 0.5 FTEs, and a part time seasonal worker working ten hours per week for four months is 0.1 FTEs.

Output

Output is the value of sales by a business. In the case of wholesale and retail trade, it is deemed to be the total value of turnover (and not simply gross margins)¹⁴.

Value-Added

Value-added includes household income (wages and salaries and self-employed income), and returns to capital (including interest, depreciation and profits). It also includes all direct and indirect taxes.

Household Income

Household income is the gross income of households. It includes the income of self-employed persons. There is sometimes considerable uncertainty as to the proportion of business income which goes to households, especially for small businesses. In assessing this proportion, dividends and interest payments to local householders have been excluded, except to the extent that "drawings" by owners for the purposes of household spending could be identified. When estimating indirect economic impacts, one needs to know the increase in household income which occurs in the study area and how it will be spent. Where owners of business capital live out of the study area, dividends and interest do not form part of the study area's household

¹³ For example, Richardson *et al.*, (1972); Jensen & West (1982), Butcher (1985).

¹⁴ Care has to be taken in combining retail sales figures with employment per \$m of output from input - output tables. In these tables, output is generally defined as gross margin. By contrast, business statistics figures usually give employment per \$m of turnover.

income. Even where the owners do live in the study area, profits which are not used for household spending do not lead to economic impacts¹⁵.

Direct Economic Impacts

The direct impact arises from the initial spending by visitors on the goods and services they want to consume. The direct employment is of people who produce and sell goods and services directly to tourists. The direct output is the value of purchases made by tourists. The direct value-added is the value-added in those businesses which sell directly to tourists.

Indirect Economic Impacts

The indirect impact arises from increased spending by businesses as they buy additional inputs so that they can increase production to meet visitor demand. This indirect effect can be envisaged as an expanding ripple effect. A tourist buys food and drink at a cafe. The cafe has to employ more staff and buy more bread, so the bakery output expands. The bakery has to employ more staff and buy more electricity, so the power company increases its output. The power company has to increase its maintenance, so it employs another person and spends more on a vehicle for that person. All the increased employment, output and value-added (apart from that at the cafe) is the indirect effect. Note that indirect effects only include "upstream" effects (via buying more inputs), but do not include any stimulated development downstream. So although an expansion of "tourism activities" such as wildlife tours may lead to more tourists and hence an expansion of accommodation, the extra accommodation is not purchased by the wildlife tours company and hence is not included in the multiplier.

Induced Economic Impact

The induced impact is the result of increased household income being spent, and leading to a further ripple effect of increased employment, output and income.

Flow-on Effects/Upstream Impacts.

The sum of indirect and induced effects are sometimes termed the flow-on effects, or upstream impacts.

Downstream Impacts

Impacts which are not driven by an activity's demand for extra inputs, but which might arise as a result of a particular activity, are sometimes called the "downstream impacts". A potential future example in Christchurch tourism would be if the development of guided trips to penguins in the evening led to people staying longer and hence to an increased demand by visitors for accommodation and food. The accommodation and food is not an input into the guiding, and hence is not an indirect or induced effect of the guiding. It is a downstream effect.

Total Economic Impacts

The total Type I impact is the sum of the direct and indirect impacts, and a Type II impact is the sum of direct, indirect and induced impacts.

Multipliers

A Type I multiplier is the ratio of (direct + indirect) impacts to direct impacts, and a type II multiplier is the ratio of (direct + indirect + induced) impacts to direct impacts. The Type II multipliers include the impact of household spending and hence will always be greater than a

¹⁵ Profits may be invested back into the study area, but the impacts of this investment are excluded on the grounds that the investment could be financed by borrowing and hence is not dependent on the earlier profits.

Type I multiplier. Both multipliers will always be greater than one. Note that downstream effects (whether positive or negative) are not included in the multiplier, and must be calculated separately.

2.3 Principles of Multiplier Analysis

When visitors spend money on various services and goods, this generates direct employment, output, and value-added. The businesses which sell to tourists use part of the money received to purchase goods and services from other local businesses, which as a result purchase more inputs than they otherwise would. These "business support" effects are generally termed "indirect" effects. To find out the scale of the indirect effects, one must estimate the expenditure patterns of the tourism businesses. What do they buy, and from where do they buy it (e.g., in Christchurch or out of Christchurch)? This estimation can be done through expenditure surveys of tourism businesses or can be estimated on the basis of national inter-industry studies, adjusted for local self-sufficiency in supplying industries.

Businesses purchase not only goods and services, but also labour. The businesses pay for labour via either wages and salaries or drawings (by the owners of the business). The increase in household income arising from tourist spending leads to increased household expenditure, which further increases output, value-added and employment in the Christchurch economy. These additional effects generated by household spending are termed "induced" effects, and their extent depends on the proportion of household spending which is undertaken within Christchurch. This proportion was estimated during the development of the GRIT model (see below) as being 96 per cent for Christchurch, but only 44 per cent for Banks Peninsula District.

2.4 Generation of Christchurch and Banks Peninsula District Economic Models

While one can estimate the purchases made by tourism businesses, this gives only the first round of indirect impacts. To estimate the additional impacts caused by the spending of businesses further down the chain, one has the option of surveying all those businesses as well (which is prohibitively expensive), or estimating the probable pattern of their expenditure on the basis of information that already exists about national average expenditure patterns of businesses of this type, and the regional location of businesses that supply those inputs. For example, if we know that one per cent of all retail costs is spent on plastic bags and we know that Akaroa has no plastics factory, then we can assume that this one per cent of costs are imported into the District. If we know that on average three per cent of retail costs is spent on uniforms, and if we know that there are sufficient clothing factories in Christchurch to be totally self-sufficient in clothing, then we assume that three per cent of retail inputs are purchased from the local clothing industry, while if Banks Peninsula District has only sufficient clothing factories to be 50 per cent self-sufficient in uniforms, then we can assume that 1.5 per cent of retail inputs are manufactured in the District and a further 1.5 per cent of inputs are imported into the area.

All the information and assumptions are incorporated into separately estimated Christchurch and Banks Peninsula District input-output models. These specific models are generated using an

existing national input-output model¹⁶, information about the regional distribution of employment and output, and a relatively simply mathematical technique called GRIT¹⁷ (Generation of Regional Input-output Tables - which estimates the source of inputs into regional industries). This model can be further adjusted by incorporating into it any survey data that has been gathered about the structure of actual tourism businesses in the Christchurch or the District, and while such surveys were carried out in earlier studies in this series, they were not repeated for this project. The input-output models can be used to calculate the total effects on all sectors of an increase in output of any single sector. These total effects include the original effect and all the consequential rounds of indirect and induced effects. Note that they do not include any downstream impacts (see definition of indirect impacts above).

The GRIT process uses City/District output by industry as its starting point. There is limited information currently available on regional output by industry, especially for smaller regions such as Banks Peninsula District. Statistics New Zealand will not release highly disaggregated data on the grounds that to do so would breach commercial confidentiality of businesses supplying the data. For most regions the most detailed data that are available relates to employment as measured by the census¹⁸. The share of employment in each industry (as reported by the 2001 Census) is used as a proxy for the share of output in each industry. Exceptions to this rule relate to agriculture and forestry industries, where information on land use and livestock numbers is used to estimate Christchurch shares of national output.

Once this has been done, the Christchurch inter-industry table is estimated using the standard GRIT procedure. It should be noted that the input/output table may show employment in some industries which differs slightly from actual employment in the District. This is so that estimates of changes in regional employment which flow from the expansion of industries reflect national average employment: output ratios rather than existing District ratios¹⁹.

A similar approach was used for estimating the Banks Peninsula District Model

2.5 Estimates of Multipliers for Tourism

Once the City and District models have been estimated, employment, output, value-added and household income multipliers can be estimated using matrix algebra²⁰. Type II multipliers (which include induced effects) were calculated. It is clear that the increased direct household income from tourism stimulates household spending and hence economic activity in the City and the District, and for this reason it seems appropriate that Type II multipliers be used to calculate total economic impacts of tourism.

16 The most recent official national model available is for 1995/96. While this may seem very dated, it is reasonably up-to-date as far as inter-industry models go, since a full model requires the collection of considerable data, much of which does not become available until two years after the year to which it refers. This model has been updated to 2000/01 by Butcher (2003), and the resultant model has been used as the basis for the regional models in this study.

17 Developed in Australia and widely used there and in New Zealand. See West *et al.*, (1982), or Butcher (1985).

18 Census data are available on both a place of residence and place of work basis. The two can be significantly different, and place of work has been used for these models.

19 For details of the reasons, see Butcher (1985) pp. 6 - 10. In short, it is believed that any under-employment in a particular regional industry will not persist long-term, and it is likely that expansion will reflect national average technology rather than current local technology.

20 Customised software (e.g., IO7- available from the authors) which undertakes the matrix manipulation is readily available. Numerous texts are available which describe general input-output models.

2.6 Estimates of Direct and Total Impacts.

Output

The approach taken to estimating direct visitor spending was to survey visitors to find out how and where they stay and how much they spend per day, and to rate this up by estimates of total visitor days provided by the International Visitor Survey (IVS), the Domestic Travel Monitor (DTM), and the Commercial Accommodation Monitor.

This approach was previously tried in the Westland Study²¹, but was discarded for a number of reasons. First, accurate recall of expenditure by survey respondents is difficult and time consuming for those spending long periods in a destination. It also has high error margins. Second, the questions on spending were part of a longer survey and there was a problem with respondent fatigue. Finally, it became obvious that visitor numbers from the IVS and DTM were likely to have a high error margin because of the low number of participants who actually visit small centres. The first problem was addressed in this study by asking visitors to estimate only expenditure in the last 24 hours (or part thereof if their stay had been less than 24 hours). The second problem was addressed by having a short stand-alone questionnaire that asked only questions about expenditure, duration of visit, and type of accommodation (average contact time per survey was less than five minutes). The third problem was reduced by amalgamating several years of DTM survey data (hence increasing the sample size and reducing the error margin), and by making use of the Statistics New Zealand "Commercial Accommodation Monitor" (CAM) to give an alternative estimate of visitor numbers. The CAM shows the annual number of visitor-nights in commercial accommodation by Territorial Local Authority and by origin. By combining this with information from the visitor survey on the proportion of total visitor-nights spent in commercial accommodation, and the ratio of day visitors to overnight visitors, it was possible to estimate both total overnight and total day trip visitor numbers. CAM data were obtained for Akaroa township as well as for Banks Peninsula.

The survey of visitor expenditure produced average expenditure per visit (for day-visitors) and per visitor-night for over-night visitors. The expenditure was broken down into categories (accommodation, food, travel etc. etc.) so that total visitor expenditure by category could be estimated. The figures for accommodation were then compared back to the regional economic model accommodation output values to check that the figures estimated in this study were reasonably consistent²².

Employment

Earlier studies in this series have included a census of tourism-related employment in which each business selling directly to tourists is asked about the number of employees and the proportion of sales which are to visitors. This approach is not feasible for large centres such as Christchurch because of the enormous number of businesses and the inability for management to judge whether sales are to residents or visitors. It remains a possibility for small centres such as Akaroa, but was not done in this project which aimed to develop and trial an alternative process for establishing the economic impacts of visitors.

21 Butcher *et al.*, 2001 (TRREC Report No. 26/2001).

22 Virtually all sales of accommodation are tourism. The difference in years and the error margins in both the regional input-output table and the visitor spending survey suggest that an error margin of up to 20 per cent is acceptable.

The national inter-industry tables and other industry studies²³ provide data on typical employment per \$ million of sales for the various sub-sectors of the tourism industry (retail, accommodation, restaurants and activities). Data on visitor expenditure in Christchurch and Banks Peninsula District were combined with these ratios to estimate Christchurch and District employment in the sub-sectors of the tourism business. Earlier work²⁴ suggests that this approach can give an estimate of output which is similar to the figure obtained by a census of employment in visitor industries.

Value-added

The national inter-industry tables and other industry studies also provide data on typical value added to output ratios for the various sub-sectors of the tourism industry (retail, accommodation, restaurants and activities). Data on visitor expenditure in Christchurch City and Banks Peninsula District were combined with these ratios to estimate Christchurch and District value added in the sub-sectors of the tourism business.

Previous analyses suggest that the error margin associated with estimates of value added in small centres is considerable. This is because the national average enterprise in a particular industry may have quite different scale and structure from the smaller scale enterprises in a town such as Akaroa. There are no specific data on the size of this error margin, and the results presented here should be seen as an indicator of the broad magnitude of tourism in the District.

Total Impacts

The multipliers estimated from the District economic model were applied to the estimates of direct employment, output and value-added to get estimates of total employment, output, and value-added arising from tourism. By definition, the difference between total and direct effects is the indirect plus induced effect.

2.7 Surveys

A survey of visitor expenditure was undertaken to gather the data necessary to estimate regional economic impacts of tourism in Christchurch and Akaroa. In Christchurch some 570 visitors were surveyed in January and February 2003, and in Akaroa some 520 visitors were surveyed in February. The surveying was done over a number of days including weekends, weekdays and public holidays in an attempt to ensure that the sampling was reasonably representative of the entire population. It would be preferable to sample from the entire visitor population, but for practical reasons the surveyors had to identify locations with large populations of visitors, and this meant that the survey was restricted to those visitors in certain geographic locations. In the case of Christchurch City, the surveying was generally done in the vicinity of the Arts Centre, the Museum and the Oxford Terrace strip. In the case of Akaroa, the surveying was done along the entire waterfront area.

It would also be preferable to undertake stratified sampling by surveying a small number of visitors in different months. The reasons for stratifying is that we expect the ratios of domestic to international visitors and day to overnight visitors will vary over the year. The Christchurch

23 "Business Activity 2001", Statistics New Zealand 2002. "New Zealand Inter - Industry Study, 1995/96", Statistics New Zealand.

24 "The Economic Impact of Tourism on Kaikoura", Butcher *et al.*, (1998).

sampling was done over several months for this reason, but the Akaroa work was a late addition to the project and hence sampling was done only over one month²⁵.

A comparison of the survey data with other visitor information data from the Commercial Accommodation Monitor and the International Visitor Survey suggests that our sample was rather biased in terms of the origins of the visitors. We are unable to determine whether this was because of the particular period we chose to survey, because some nationalities either do not visit the specific locations where surveying was done, refused to take part in the survey, or can not take part because of language difficulties. The Commercial Accommodation Monitor indicates that around 47 per cent of guest nights in Christchurch are by New Zealand residents, but in our sample only seven per cent of the overnight visitors were from New Zealand. In the case of Akaroa the commercial accommodation monitor suggests that 68 per cent of all visitors are from New Zealand, whereas in our sample only 48 per cent of those using commercial accommodation were from New Zealand. This probably reflected the timing of the survey, which was at the end of January and in early February and after the major pulse of domestic holidaymakers.

The data presented in the next chapter suggest that the overnight expenditure by New Zealand and international visitors in Akaroa was reasonably similar at \$78 and \$83 respectively, so the survey bias may not be significant in terms of results. The data for Christchurch also suggest similar expenditure by New Zealand and international visitors at \$132 and \$130 respectively. However, the expenditure per visit by day visitors to Akaroa varied from \$32 for New Zealand visitors to \$67 for international visitors. While the sample in both cases is small (91 New Zealand visitors and 164 international visitors), the difference in expenditure is statistically significant, and any errors in the mix of visitors could be significant in terms of estimates of overall visitor spending.

2.8 Description of Visitor Mix

Akaroa

Of the 519 visitors interviewed in Akaroa in February, 49 per cent (255) were day visitors. Of the day visitors, 19 per cent were from Christchurch, 17 per cent were from elsewhere in New Zealand, and 64 per cent were from other countries. Of the overnight visitors, 57 per cent were staying in non-commercial accommodation²⁶, while the other 43 per cent (196) stayed in commercial accommodation. Of the New Zealand overnight visitors, only 36 per cent were staying in commercial accommodation, whereas for overseas visitors the figures was 64 per cent. The average duration of stay for day visitors was 4.7 hours and for all overnight visitors was 3.4 days, with a median of 2.0 days.

The survey ratio of day visitors to commercial overnight visitors at 2.2:1 is at variance with the ratio of 2.8:1 derived from the Cullen/Dakers²⁷ survey of 1,271 visitors. That survey covered three distinctly different time periods, including the quieter season of October, the shoulder

25 Sampling for another project in Akaroa was carried out in October, December and January. This survey produced significantly different ratios of day visitors to overnight visitors and commercial accommodation to non-commercial accommodation visitor nights.

26 The Commercial Accommodation Monitor includes virtually all forms of accommodation, including B&Bs and other homestays. However, coverage is generally limited to those establishments with turnover greater than \$30,000 per year and excludes establishments primarily offering accommodation for periods of one month or more.

27 Cullen, R., Dakers, A., McNicol, J., Meyer-Hubbart, G., Simmons, D. and Fairweather, J. (2003). Tourism, Waste and Water in Akaroa: Implications of tourist demand on infrastructure TRREC Report No. 38.

period of December, and the domestic visitor peak period of January. By contrast our survey was the end of January and early February when the international season is reaching its peak, and we expect the ratio of day to overnight visitors to be lower for that group. In estimating economic impacts we have retained our ratio of 2.2, partly because it gives results which are more consistent with the total size of the Akaroa economy. Our survey ratio for domestic visitors only was 1.65, and this lower number receives some support from the DTM survey ratio of 1.3. However, we have already noted that the DTM survey is so small that it has little value at this scale of application.

Christchurch

There were 571 visitors to Christchurch who were surveyed and 518 of them gave details of their expenditure. Only three per cent of the visitors were day visitors while the balance were staying one or more nights, with a median stay of three days and an average stay of 12.6 days. The high average stay was due to the 23 per cent of overnight visitors who stayed more than six days, including six per cent who stayed for more than one month. Of the day visitors, 22 per cent were from New Zealand and the other 78 per cent were from other countries. Of the overnight visitors who gave expenditure details, only five per cent (27) were from New Zealand, with the balance coming from 36 other countries. Of the domestic overnight visitors, 58 per cent stayed in commercial accommodation, while 71 per cent of the international overnight visitors stayed in commercial accommodation.

The very small sample of domestic visitors in our survey suggests that the domestic visitor numbers derived from our survey are quite unreliable. Accordingly we have used the results from the DTM survey, where approximately 300 respondents reported trips to Christchurch. Thirty seven per cent of them stayed in commercial accommodation, and the ratio of visitor days to commercial visitor guest nights was about 1.3.

The IVS suggests that there were 3,966,000 international guest nights in Christchurch in 2001 and the commercial accommodation monitor reports that only 1,390,000²⁸ of these were in commercial accommodation. This implies that only 43 per cent of international visitor guest nights in Christchurch are in commercial accommodation and most of the balance are in private homes or other rented accommodation including student hostels. Given that there were 1,540,000²⁹ international visitor nights in commercial accommodation in Christchurch in the year to January 2003, the implication is that there were 2,800,000 visitor-nights in non-commercial accommodation. That is to say that on average night there are 7,800 international visitors in Christchurch staying in domestic dwellings or other rented accommodation. The large difference between the proportions revealed in our survey and the proportions implied by the IVS suggest that our survey was biased in this regard. The IVS data seem quite feasible when one considers the large number of long term international visitors to Christchurch including English language students, and the fact that long stay visitors are likely to visit the survey site far less frequently per day of visit than are short stay visitors.

There are alternative estimates of international visitor nights available, and these suggest that international visitor nights per year are about 3.23 million rather than the 3.97 million we have assumed in this study. This lower figure suggests that 43 per cent of international visitor nights are in commercial accommodation and that on average there are only 4,600 international visitors

28 53 per cent of the 2,629,000 commercial accommodation guest-nights in Christchurch for the year to Dec 2001.

Note that the ratio for Canterbury as a whole is only 39 per cent, which demonstrates the importance of getting CAM data for Christchurch only rather than using Canterbury data as a proxy.

29 53 per cent of the 2,878,000 total commercial accommodation guest nights

per night staying in non-commercial accommodation including private homes, rented accommodation or student hostels.

The question as to which of the visitor nights figures is correct is still being reviewed by the New Zealand Tourism Research Council, but establishing the correct figure is clearly of some significance. In Christchurch the difference in the figures is about 18 percent. This is probably not particularly significant in terms of planning for urban infrastructure because Christchurch is not a very tourism-intensive community, but it could be of considerable importance in a community which has a strong tourism focus.

Chapter 3 Direct Tourism Impacts

3.1 Introduction

This chapter focuses only on direct tourism impacts while the next chapter focuses on multipliers and Chapter 5 brings all these figures together to show total impacts of tourism. This chapter starts with direct tourism sales (as well as gross margins in the case of retailing), added value and household income on the basis of ratios of: national average employment to output, household income to output, and value-added to output. The results presented here are brought together in a comprehensive table at the end of the chapter.

3.2 Spending Per Visitor Per Day-Trip or Per Night

Direct spending per visitor in Christchurch and Akaroa was estimated on the basis of the surveys of visitor spending outlined above. The results show (see Table 3 below) that total direct expenditure by visitors in Christchurch was approximately \$64 per person per day for day visitors and \$130 per person per night for overnight visitors. In Akaroa (see Table 4 over) the figures are \$54 per person per visit for day visitors and \$81 per person per night for overnight visitors. The breakdown between visitor origins and types of expenditure is also shown in the tables below, although no visitor origin split is given for Christchurch day visitors because the sample is so small.

**Table 3
Expenditure Per Person Per Day-Trip and Per Night in Christchurch**

	Day Trip			Overnight		
	NZ	Other	Total	NZ	Other	Total
Accommodation			0.0	25.3	37.1	36.2
Travel (including rental vehicles)			20.8	17.7	10.1	10.7
Food and Drink at restaurants, hotels and takeaways;			27.0	32.1	31.4	31.5
Entertainment and Activities	-	-	5.5	18.1	11.8	12.2
Petrol			0.0	7.4	1.5	1.9
Other Retail			11.1	27.5	30.9	30.6
Miscellaneous			0.0	3.7	6.8	6.6
Total (\$ /person /visit or /night)			64.3	132.0	129.6	129.7
Number of visitors in Sample	4	14	18	40	513	553

Notes: 1 "Other retail" includes groceries, clothes, souvenirs etc. etc. "Petrol" is identified separately because it has such a low retail margin compared with other goods.

2 Travel includes all to/ from or in the centre, including costs of rental vehicles accrued in the last 24 hours

Table 4
Expenditure Per Person Per Day-Trip and Per Night in Akaroa

	Day trip			Overnight		
	NZ	Other	Total	NZ	Other	Total
Accommodation	0.0	0.0	0.0	24.1	21.1	22.8
Travel (including rental vehicles)	0.1	4.2	1.5	0.3	1.6	0.9
Food and Drink at restaurants, hotels and takeaways;	13.1	13.9	13.6	18.0	17.8	18.1
Entertainment and Activities	12.9	31.7	25.2	10.2	21.4	14.9
Petrol	1.1	2.0	1.7	2.4	3.1	2.8
Other Retail	4.5	13.7	10.5	15.7	14.7	15.6
Miscellaneous	0.4	1.4	1.1	6.8	3.1	5.4
Total (\$ /person /visit or /night)	32.1	66.8	53.5	77.6	82.8	80.4
Number of visitors in Sample	91	164	255	151	113	264

3.3 Number of Visitors

The number of visitors can be identified from at least three sources. The first is the International Visitor Survey (IVS) and the second is Domestic Tourism Monitor (DTM). The IVS includes all visitor nights, no matter what type of accommodation was used, but excludes day visits. An estimate of day visits has to be made based on surveys to ascertain the ratio of day-trip visitors to overnight visitors. The sample size for the IVS is around 6,000 out of a total of 1,900,000 international visitors in 2001. This suggests that the sample of visitors made less than 106³⁰ visits to Akaroa and 2,500 visits to Christchurch. The small sample visiting Akaroa means that there is a high error margin in the estimate of international visitor nights in Akaroa. The DTM has a sample of about 15,000 per year, and the number of DTM respondents who had actually visited Akaroa or Christchurch was about 40 per year and 300 per year respectively. Again the sample for Akaroa is so small as to imply very high error margins, especially for variables such as the ratio of day visit to guest nights, or commercial accommodation to non-commercial accommodation guest nights.

The second source of information on visitor numbers is the Commercial Accommodation Monitor (CAM) combined with survey data on the proportion of both domestic and international visitors who use commercial accommodation. The CAM is a semi-census³¹ of all commercial accommodation with data being available on a monthly basis.

Akaroa

The IVS data suggest that in 2002 there were 33,632 international visitor visits³² to, and 58,056 visitor-nights in, Akaroa. There were a further 2,622 international visitor nights elsewhere in Banks Peninsula District giving a total of 60,678 international visitor-nights in Banks Peninsula District.

30 Some respondents may make more than one visit

31 There is not a 100 per cent response rate, and the question on visitor origin is only asked every third month.

32 A visit is defined as a trip to a location at which one or more consecutive nights was spent.

When scaled up the DTM would suggest that in 2001 there were 201,000 domestic visitor-nights in, and 268,000 day trips to, Akaroa. The DTM also suggests that there were 245,000 visitor-nights to Banks Peninsula and 355,000 day-visits to Banks Peninsula District, including Akaroa.

The CAM suggests that in the year to January 2003 there were 58,970 visitor-nights in commercial accommodation in Akaroa³³, including 39,960 domestic visitor-nights and 20,010 international visitor-nights. Our survey in Akaroa suggests that 36 per cent of domestic visitor nights and 52 per cent³⁴ of international visitor nights were in commercial accommodation. This implies that in total there were 145,000 visitor nights in Akaroa, including 107,000 domestic visitor-nights and 38,000 international visitor-nights. This conflicts with the IVS estimate of 58,000 visitor nights in Akaroa. We suspect that the majority of international visitors who stay in the Banks Peninsula District stay around Akaroa Harbour or in the outer bays, and would probably describe their stay incorrectly in the IVS as Akaroa. This view is supported by the fact that at the Banks Peninsula District level the CAM suggests there are 58,000 international visitor-nights in commercial accommodation and hence possibly 110,000³⁵ international visitor-nights overall for the year ended January 2003, while the IVS data suggests there are only 61,000 visitor-nights (excluding those aged under 15 years of age) in 2001, since which time there has been of the order of 15 per cent growth. We believe that the CAM-based figures are likely to be the most accurate at the Akaroa level, and for this reason we have used them in this analysis.

There is an enormous discrepancy between the CAM survey data and the DTM data relating to Akaroa with respect to both the number of domestic visitor-nights and the ratio of day visits to overnight visits. Given the extremely small number of DTM responses we have preferred the CAM survey data.

Christchurch

Some 70 per cent of our surveyed international over-night visitors were in commercial accommodation. The IVS data (see earlier section) suggests that the proportion of all international visitor guest nights staying in commercial accommodation is 35 per cent. Given the size of our sample and the fact that we know it is likely to be biased because we only sampled from limited locations, we have used the IVS ratio³⁶. In estimating spend per international visitor-night, we calculated separate averages for visitors in commercial and non-commercial accommodation (\$139 and \$110 respectively) and used the IVS-based ratios of commercial to non-commercial accommodation guest nights.

The CAM suggests that in 2002 there were 1,540,000 international visitor-nights in commercial accommodation in Christchurch. This implies that there were a further 2,860,000 international visitor-nights in non-commercial accommodation. Our survey also suggests that international day trips are equivalent to only three per cent of international commercial accommodation guest nights. Hence we estimate that there were 42,000 international day-trips to Christchurch in 2002.

The CAM suggests that in the same year there were 1,340,000 domestic visitor guest nights in commercial accommodation, and the DTM suggests that around 35 per cent of domestic guest

33 It is interesting to note that according to the CAM, only 37 per cent of all commercial accommodation visitor-nights in Banks Peninsula District were in Akaroa itself.

34 The samples are small and over a very limited period. Nonetheless, we feel that the estimates will be improved by applying the different ratios to the two populations.

35 Assuming the ratio of commercial to non-commercial accommodation is the same in the rest of Banks Peninsula as in Akaroa

36 Although other data based on international visitor arrivals suggests the true figure maybe closer to 45 per cent.

nights are in commercial accommodation. Accordingly we estimate that there were 2,487,000 domestic guest nights in non-commercial accommodation.

The ratio of day visits to guest nights implied by the DTM data suggests that in 2002 there were 1,741,000 domestic day-visits to Christchurch. These data are summarised in Table 5.

Table 5
Visitors to Christchurch and Akaroa in Year to January 2003

	Guest nights				Day Visits	
	Commercial		Non-commercial		Domestic	International
	Domestic	International	Domestic	International		
Christchurch	1,339,000	1,539,000	2,487,000	2,857,000	1,741,000	42,000
Akaroa	39,000	20,000	68,000	18,300	64,500	55,600

3.4 Total 2002 Direct Spend by Visitors to Akaroa and Christchurch

To get total direct spend in each sub-sector (e.g., accommodation) we multiplied the number of visitors in a category by the direct sub-sector spend per visitor in that category. This gave us spend by sub-sector by visitor category as shown in Table 6 and Table 7. The totals were \$1,103 million and \$17 million respectively for Christchurch and Akaroa. We then used the output figures to estimate direct employment and value added in each sub-sector, as is described further on in this report.

As a check on the direct expenditure estimates, we compared the resulting accommodation employment figures with 2001 census figures on employment, adjusted to average 2002 figures using growth in commercial accommodation guest nights over the corresponding period as a proxy for employment growth. The comparison suggested that our estimates of direct tourism spending were 4 per cent too low in Akaroa and 3 per cent too low in Christchurch. This is an extremely good fit and gives us some confidence that we have made reasonable estimates of visitor spending in Christchurch and Akaroa. We also compared the employment in other sub-sectors of tourism with total employment in those sub-sectors. Generally the results suggested that our estimates are realistic except that our estimate of employment in restaurants and cafes in Akaroa appears to exceed actual employment by almost 30 per cent. Subsequent discussions with interviewers showed that most respondents had included all meals they had in the period they were staying at Akaroa, even if these were outside the strict confines of the Town.

Table 6
Estimated Direct Sales in Christchurch Tourism
(Year ended January 2003 - \$M)

	Overnight		Day		Total
	Domestic	International	Domestic	International	
Accommodation	63.2	88.3	0.0	0.0	151.5
Travel (including rental vehicles)	56.2	48.4	36.2	0.9	141.7
Restaurants, hotels and takeaways;	121.5	132.8	47.0	1.1	302.4
Entertainment and Activities	57.2	46.9	9.6	0.2	114.0
Petrol	26.5	8.2	0.0	0.0	34.7
Other Retail	125.1	160.3	19.3	0.5	305.1
Miscellaneous	12.6	41.1	0.0	0.0	53.7
Total Sales	462.0	526.0	112.0	2.7	1,103.0

1 "Output" in retail in this table defined as "sales".

2 Accommodation includes payments made to private home-owners

Table 7
Estimated Direct Sales and Output in Akaroa Tourism
(Year ended January 2003 - \$M)

	Overnight		Day		Total
	Domestic	International	Domestic	International	
Accommodation	2.58	0.81	0.0	0.00	3.9
Travel (including rental vehicles)	0.03	0.07	0.01	0.23	0.3
Restaurants, hotels and takeaways;	1.92	0.68	0.84	0.77	4.2
Entertainment and Activities	1.09	0.82	0.83	1.76	4.5
Petrol	2.60	0.12	0.07	0.11	0.6
Other Retail	1.68	0.56	0.29	0.76	3.3
Miscellaneous	0.73	0.18	0.03	0.08	1.0
Total Sales	8.30	3.17	2.07	3.71	17.3

3.5 Employment, Direct Value-added and Household Income in Tourism

Information on the ratio of employment to output, value-added to output and, household income to output comes from the study input/output models, which in turn are based on the Statistics New Zealand³⁷ national model. By combining these ratios with our estimates of direct visitor spending we were able to estimate direct employment, value added and gross household income which are dependent on visitor spending. The ratios are show in Table 8.

The household income figures for small businesses are uncertain because the reported allocation of income between profits and drawings reflects very much accounting and tax advantages rather

³⁷ "Business Activity 2001"; "National Inter-Industry Study 1995".

than actual financial flows. However, while the small businesses are large in number, they represent less than a third of the survey turnover.

3.6 Conclusion

Tables 8 and 9 bring together the key results of this chapter. Visitors to Christchurch in 2002 spent approximately \$1,100 million in the City. This expenditure led directly to almost 11,000 jobs, \$375 million of value-added, and \$244 million of household income. This employment was equivalent to over 8 per cent of total employment in Christchurch. As suggested earlier, alternative data on international visitor nights suggests that there may be considerable fewer international visitor nights in non-commercial accommodation. If these alternative figures are correct, then the direct economic impact would be around seven per cent less than we have estimated here.

Visitors to Akaroa in 2002 spent approximately \$17 million in the township or close by. This expenditure led directly to 180 jobs, \$6.0 million of value-added, and \$3.8 million of household income. This employment was equivalent to almost 50 per cent of all jobs in the town.

Table 8
Direct Employment, Value-added and Household Income in Christchurch Tourism

Sector	Sector Sales (\$M)	Direct Value-added to Output Ratio	Direct H/hold Income to Output Ratio	Direct Empl./\$M	Direct Impacts		
					Value-added (\$M)	H/hold Income (\$M)	Empl. (FTEs)
Accommodation	151.5	0.33	0.26	15.8	50.0	39.4	2,392
Transport	141.7	0.43	0.27	7.1	60.9	38.3	1,007
Restaurants & Cafes	302.4	0.44	0.27	15.6	133.0	81.6	4,720
Activities	114.0	0.46	0.24	6.4	52.4	27.4	730
Petrol	34.7	0.05*	0.04*	1.4*	1.7	1.4	48
Retail	305.0	0.16*	0.13*	4.6*	52.3	42.7	1,484
Miscellaneous	53.7	0.45	0.26	11.0	24.2	13.7	591
	1,103.0	0.34*	0.22*	9.9*	374.6	244.4	10,973

*Note that these are ratios to turnover. In retail trade, "output" often refers to gross margin rather than turnover.

Table 9
Direct Employment, Value-added and Household Income in Akaroa Tourism

Sector	Sector Sales (\$M)	Direct Value-added to Output Ratio	Direct H/hold Income to Output Ratio	Direct Empl./\$M	Direct Impacts		
					Value-added (\$M)	H/hold Income (\$M)	Empl. (FTEs)
Accommodation	3.4	0.33	0.26	15.8	1.1	0.9	59
Transport	0.3	0.43	0.26	6.3	0.1	0.1	3
Restaurants & Cafes	4.2	0.44	0.27	15.6	1.8	1.1	72
Activities	4.5	0.43	0.24	3.4	1.9	1.1	23
Petrol	0.6	0.05*	0.04*	1.4*	0.0	0.0	1
Retail	3.3	0.16*	0.13*	4.6*	0.5	0.4	15
Miscellaneous	1.0	0.44	0.26	9.5	0.4	0.2	11
	17.3	0.35*	0.22*	10.6*	6.0	3.8	184

Chapter 4

Multipliers and Total Tourism Impacts

4.1 Estimates of Multipliers for Tourism

Multipliers were generated directly from the basic GRIT-generated City and District tables. These multipliers are given in Table 10 and Table 11 for the five major industry groups of accommodation, transport, restaurants and cafes, activities and retail trade. Employment multipliers for Akaroa³⁸ range from 1.04 - 1.27 and total employment impacts range from 8.0 - 16.6 jobs per \$1 million of direct visitor expenditure. Output multipliers range from 1.11 - 1.25. Value-added multipliers range from 1.14-1.27 and total value-added ranges from 39 per cent to 56 per cent of direct visitor expenditure. Household income multipliers range from 1.11 - 1.25, and total household income ranges from 29 per cent to 43 per cent of direct visitor expenditure.

Christchurch City multipliers are higher. Employment multipliers range from 1.3 - 2.24 and employment per \$1 million of visitors spending ranges from 12.6 - 21.4 FTEs. Total value added ranges from 74 per cent - 98 per cent of direct visitor spending, and gross household income ranges from 46 per cent - 66 per cent of direct visitor spending.

The interpretation of the figures in Table 10 for Christchurch City (using accommodation as an example) is as follows:

- **Output** Every \$1 million of visitor spending has flow-on effects of \$1 million (0.66 indirect, plus 0.34 induced), and the total increase in output is \$2 million.
- **Employment** Every \$1 million of annual spending increases employment directly by 15.8 FTEs, and flow-on effects generate a further 5.6 FTEs so that in total 21.4 FTEs are created. The ratio of total to direct employment effects is 1:35.
- **Value-added** Every \$1 million of direct expenditure increases value-added directly by \$0.33 million, and flow-on effects increase value-added by a further \$0.41 million so that in total valued added in Christchurch increases by \$0.74 million. The ratio of total to direct value-added effect is 2.24.
- **Household Income** Every \$1 million of direct expenditure increases household income directly by \$0.26 million, and flow-on effects increase household income by a further \$0.21 million, so that in total household income increases by \$0.48 million. The ratio of total to direct household income effects is 1.85.

³⁸ Leaving aside visitor centre multipliers, because these are not directly commercial ventures funded by visitor spending.

Table 10
Tourism Impacts and Multipliers in Christchurch City

	Accommodation	Travel	Restaurants & Cafes	Activities	Retail *
Output Multiplier					
Direct	1.00	1.00	1.00	1.00	1.00
Indirect	0.66	0.76	0.49	0.60	0.55
Induced	0.34	0.41	0.33	0.34	0.46
Multiplier (Type II)	2.00	2.17	1.82	1.94	2.02
Employment Impacts					
Direct (FTEs/\$m)	15.8	7.1	15.6	6.4	13.9
Indirect	3.4	5.4	2.6	4.0	3.3
Induced	2.2	2.6	2.1	2.2	3.0
Total (FTEs / \$m)	21.4	15.1	20.3	12.6	20.1
Multiplier (Type II)	1.35	2.24	1.30	1.96	1.45
Value-added					
Direct: Output ratio	0.33	0.43	0.44	0.46	0.49
Indirect	0.25	0.35	0.19	0.28	0.25
Induced	0.16	0.20	0.16	0.16	0.22
Total: Output ratio	0.74	0.98	0.79	0.90	0.96
Multiplier (Type II)	2.24	2.28	1.78	1.97	1.95
Household Income					
Direct: Output ratio	0.26	0.27	0.27	0.23	0.40
Indirect	0.15	0.13	0.11	0.17	0.15
Induced	0.07	0.10	0.07	0.09	0.11
Total: Output ratio	0.48	0.57	0.46	0.47	0.66
Multiplier (Type II)	1.85	2.11	1.68	2.06	1.64

- Notes: 1 The survey data were incorporated into the Christchurch table (generated by the GRIT process) and multipliers were then calculated from this expanded and adjusted table.
- 2 The multipliers were obtained directly from the GRIT-based District table, and do not take account of the survey data. Visitor centres are based on education.

As one might expect, the very limited range of manufacturing and services support enterprises in Akaroa means that multipliers are very low (Table 11). We have estimated multipliers for the Banks Peninsula District, and expect that probably only half of the flow-on effects within the District will occur in Akaroa itself.

Multipliers in Christchurch City are much greater, reflecting the diversity of manufacturing and services support which the City can provide to its tourism businesses.

Table 11
Tourism Impacts and Multipliers in Akaroa Town

	Accommodation	Travel	Restaurants & Cafes	Activities	Retail *
Output Multiplier					
Direct	1.00	1.00	1.00	1.00	1.00
Indirect	0.09	0.20	0.07	0.12	0.07
Induced	0.04	0.05	0.05	0.05	0.06
Multiplier(Type II)	1.13	1.25	1.11	1.16	1.13
Employment Impacts					
Direct (FTEs/\$m)	15.8	6.3	15.6	9.5	13.9
Indirect	0.6	1.4	0.4	0.8	0.5
Induced	0.3	0.3	0.3	0.3	0.4
Total (FTEs / \$m)	16.6	8.0	16.3	10.7	14.7
Multiplier (Type II)	1.05	1.27	1.04	1.12	1.06
Value-added					
Direct : Output ratio	0.33	0.43	0.44	0.43	0.49
Indirect	0.04	0.09	0.03	0.06	0.04
Induced	0.02	0.03	0.03	0.03	0.04
Total : Output ratio	0.39	0.55	0.49	0.51	0.56
Multiplier (Type II)	1.17	1.28	1.06	1.19	1.14
Household Income					
Direct : Output ratio	0.26	0.26	0.27	0.26	0.40
Indirect	0.02	0.05	0.01	0.04	0.01
Induced	0.01	0.01	0.01	0.01	0.01
Total : Output ratio	0.29	0.32	0.29	0.30	0.43
Multiplier (Type II)	1.11	1.25	1.08	1.17	1.07

4.2 Surveying to Improve Multipliers

The purpose of undertaking surveys of business purchasing patterns is to ensure that a district economic model reflects the expenditure patterns of businesses more accurately than does the Basic GRIT model. In earlier work in other tourism destinations we concluded that applying Basic GRIT multipliers to survey estimates of direct impacts in order to estimate total impacts will give generally reliable results for employment, but not such reliable results for value-added (Butcher *et al.*, 1998, 2000, 2001).

We also concluded that detailed surveying provides more accurate results and is justified where this greater accuracy is necessary. Our judgement was that in the case of the three districts we have previously studied (Kaikoura, Rotorua and Westland) the surveying had been worthwhile both to establish more accurately the margins of multiplier error and also to establish the absolute

level of economic effect. Given that results suggest the Basic GRIT tables are only accurate to plus or minus 20 per cent, and given that the error sign is not consistent, then in our view surveying is justified in almost all cases where decision makers wish to know something about the economic impacts of industry growth or decline. This is particularly the case where (as in tourism, and particularly in tourism activities) basic data about the size of the industry are not known, or where the industry is not easily analysed from the existing input-output tables.

Nonetheless in this study we did not undertake surveying to improve multipliers for Akaroa and Christchurch. In the case of Akaroa we believed *a priori* that the multipliers would be very low (of the order of 1.1 – 1.2), and that survey effort would be most profitably employed in estimating direct visitor spending. In the case of a large and diversified economy like Christchurch we knew that surveying would have to be on an enormous scale to give reliable results and that this surveying would be prohibitively expensive. Moreover, we also believed that since Christchurch is a significant part of the New Zealand economy, it is reasonable to apply multipliers derived from a GRIT process which assumes that the production functions (mix of inputs) in a given industry are likely to be similar for both the City and for New Zealand.

Chapter 5

Total Impacts of Tourism on Christchurch and Akaroa

5.1 Introduction

This chapter brings together the data on direct impacts and multipliers to estimate total economic impacts of tourism in Christchurch and Akaroa. The direct impacts of tourism (Table 6 and Table 7) are combined with the tourism multipliers generated from the survey-enhanced GRIT District model (Table 10 page 3 and Table 11 page 27) to generate estimates of total tourism employment, output and value-added impacts in Christchurch City and Akaroa Township. These results are summarised in Table 12 (page 29) and Table 13 (page 31). The final part of this section summarises our views about the most appropriate ways of estimating economic impacts.

5.2 Output

Visitor spending was an estimated \$1,103 million in Christchurch in 2001. Flow-on effects increase the total tourism-dependent output in the District to \$1,935 million per year.

It is estimated that annual visitor spending was approximately \$17 million in Akaroa Township in 2002, and flow-on effects increases this to \$19.2 million.

Table 12
Summary of Economic Impacts of Tourism on Christchurch City

	Direct Impacts	Multipliers (Type II)	Total Impacts
Output (\$m)			
Accommodation	152	2.00	303
Travel	142	2.17	307
Restaurants & Cafes	302	1.82	550
Activities	114	1.94	221
Retail	340 (110)*	2.02	452
Other	53	1.88	101
Total	1,103	1.75 (implied)	1,935
Employment (FTEs)			
Accommodation	2,390	1.36	3,250
Travel	1,010	2.13	2,140
Restaurants & Cafes	4,720	1.30	6,150
Activities	730	1.96	1,430
Retail	1,530	1.45	2,220
Other	590	1.49	880
Total	10,970	1.46 (implied)	16,070

Table 12 continued

	Direct Impacts	Multipliers (Type II)	Total Impacts
Value-added (\$m)			
Accommodation	50	2.25	112
Travel	61	2.28	139
Restaurants & Cafes	133	1.78	239
Activities	52	1.97	103
Retail	54	1.95	106
Other	24	1.88	45
Total	376	1.98 (implied)	744
Household Income (\$m)			
Accommodation	39	1.83	71
Travel	38	2.11	81
Restaurants & Cafes	82	1.68	139
Activities	27	2.06	54
Retail	44	1.64	73
Other	14	1.79	25
Total	244	1.81 (implied)	442

*The first figure is sales, the second figure in brackets is gross margin, and it is the latter figure to which the multiplier is applied to establish the indirect and induced effects.

5.3 Employment

On the basis of the information collected by our surveys and supplemented with data from other sources, it is estimated that direct employment in tourism (including a share of employment in businesses who sell only part of their output to tourists) is 160 FTEs in Akaroa or in other restaurants and cafes nearby. More people than this work in industries with a significant (>50%) tourism component, but some of the employees are part time and some sectors sell only part of their output to visitors

On the basis of the estimated employment multipliers and (additional downstream indirect) employment, we conclude that tourism generates a total of 172 FTE jobs in, or close to, Akaroa. On average, every direct tourism job generates approximately 0.08 other jobs elsewhere in the town. A comparison of indirect and induced impacts suggests that about one third of this additional activity arises as a result of increased household spending by those working in the industries which depend on tourism.

Figures from the March 2001 census suggest that in March 2000 there were some 261 jobs (FTE) in Akaroa, and this has probably grown closer to 300 FTEs since. If this is so, then close to 50 per cent of all jobs in the town depend directly on tourism, and more than 50 per cent depend directly or indirectly on tourist spending. The total direct employment of 172 FTEs in tourism makes it the dominant sector of the town's economy.

Christchurch

We estimate that direct employment in tourism (including a share of employment in businesses who sell only part of their output to tourists) is 10,970 FTEs in Christchurch in 2002. On

average every job in tourism generates a further 0.46 jobs elsewhere in the City economy. These strong linkages within the Christchurch economy mean that an estimated 16,070 FTE jobs are either directly or indirectly dependent on tourism. Given that employment in the city in 2000/01 was around 123,000, and that this has probably grown to around 130,000 by 2002, this implies that eight per cent of all employment is directly dependent on tourism, and almost 12 per cent of all employment depends either directly or indirectly on tourism.

On the basis of the estimated employment multipliers and (additional downstream indirect employment), we conclude that tourism generates a total of 172 FTE jobs in, or close to, Akaroa. On average, every direct tourism job generates approximately 0.08 other jobs elsewhere in the Township. A comparison of indirect and induced impacts suggests that about one third of this additional activity arises as a result of increased household spending by those working in the industries which depend on tourism.

Figures from the March 2001 census suggest that in March 2000 there were some 261 jobs (FTE) in Akaroa, and this has probably grown closer to 300 FTEs since. If this is so, then close to 50 per cent of all jobs in the Township depend directly on tourism, and more than 50 per cent depend directly or indirectly on tourist spending. The total direct employment of 172 FTEs in tourism makes it the dominant sector of the Town's economy.

5.4 Value-added and Household Income

Visitor spending generated directly \$6.0 million of value-added in Akaroa in 2002, and approximately \$3.9 million of this is gross household income. The inclusion of flow-on effects means that total tourism-dependent value-added in the Township is approximately \$6.9 million per year, with \$4.3 million of this being gross household income.

In Christchurch, visitor spending generated directly \$376 million of value-added in 2002, and approximately \$244 million of this was gross household income. The inclusion of flow-on effects means that total tourism-dependent value-added in the City is approximately \$744 million per year, with \$442 million of this being gross household income.

Table 13
Summary of Economic Impacts of Tourism on Akaroa Town

	Direct Impacts	Multipliers (Type II)	Total Impacts
Output (\$m)			
Accommodation	3.39	1.13	3.81
Travel	0.34	1.25	0.42
Restaurants & Cafes	4.22	1.11	4.68
Activities	4.51	1.16	5.21
Retail	3.86 (1.05)	1.13	4.00
Other	0.95	1.14	1.08
Total	17.3	1.11 (implied)	19.2

Table 13 continued

Employment (FTEs)			
Accommodation	54	1.05	56
Travel	2	1.27	3
Restaurants & Cafes	66	1.04	69
Activities	15	1.12	19
Retail	15	1.06	16
Other	9	1.13	10
Total	160	1.08 (implied)	172
Value-added (\$m)			
Accommodation	1.12	1.17	1.30
Travel	0.14	1.25	0.19
Restaurants & Cafes	1.86	1.08	2.07
Activities	1.94	1.17	2.28
Retail	0.51	1.07	0.59
Other	0.41	1.14	0.47
Total	6.0	1.15	6.9
Household Income (\$m)			
Accommodation	0.88	1.08	0.95
Travel	0.09	1.25	0.11
Restaurants & Cafes	1.14	1.08	1.23
Activities	1.08	1.17	1.28
Retail	0.42	1.07	0.45
Other	0.24	1.13	0.27
Total	3.9	1.11 (implied)	4.3

5.5 Effective Ways of Estimating Economic Impacts of Tourism

We have now estimated economic impacts in a number of ways in five different centres. Over that time new or more reliable sources of data have become available and consequently our views on the best ways of estimating direct impacts have changed.

For both large and small centres we favour surveys of visitor expenditure to get expenditure per person as well as estimates of the ratios of various visitor types. For small centres we believe the most accurate estimates of visitor numbers can be made by combining these ratios with guest-nights from the CAM. For large centres we believe that the most accurate estimates of visitor numbers of each type (apart from international day visitors) will come from the IVS and the DTM. This is because in large centres the choice of survey location is quite likely to generate a bias in the ratios of visitor types³⁹.

For small centres we believe that there is considerable value in a census of all businesses selling directly to tourists to find out employment generated directly by tourism. This process is not feasible in large centres where it is necessary to rely on visitor expenditure combined with ratios of employment to dollar output.

³⁹ Because different visitor types will have different probabilities of visiting the chosen survey locations.

We believe that in both large and small centres accurate estimation of direct expenditure by visitors and direct employment in the industry is much more important than accurate estimation of multipliers. Estimates of multipliers can be made from models estimated by the GRIT processes, and these multiplier estimates can be made more accurate by undertaking business surveys. In small centres the improvements of accuracy may be significant in proportion terms but small in absolute terms. For example, a multiplier may change from 1.2 in the GRIT method to 1.3 after surveying business expenditure patterns. The flow-on impacts under the two estimates are hence 0.2 and 0.3 of the direct impacts respectively and differ by 50 per cent. However, because the flow on impacts are small, the difference in total impacts maybe in the order of eight - ten per cent (i.e., 1.3/1.2). In large centres the flow-on effects are likely to be much bigger, say of the order of 0.8. However, the GRIT multipliers are likely to be more accurate⁴⁰, and hence the flow-on effects as estimated by business surveys are likely to differ by perhaps 0.1 from those estimated by the GRIT process. This is a 12.5 per cent error in the flow-on effects and only a 5.5 per cent error in the total impacts.

We continue to hold the view that surveys in small centres in particular can be very valuable in more accurately estimating the flow-on effects. If the objective is to estimate total visitor impacts then scarce resources can most usefully be applied to visitor surveying. Improving multiplier estimates is only a good use of resources if there are already good data on direct visitor spending or if there is some particular importance in establishing the flow-on effects accurately.

Our views on the importance of improving direct visitor impacts were strengthened during this project by the recognition that there is still considerable uncertainty about the most basic measure of tourism volume, the number of visitor nights. This is the basic figure to which estimates of spend per visitor and then economic multipliers are applied. Compared to the difference of 18 per cent in the two approaches to estimating visitor nights, small improvements in the accuracy of estimates of spend per visitor or multipliers are not significant.

40 Input coefficients are more likely to be similar to national coefficients in large regions than in small ones.

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Appendix 1

A Users Guide to Estimating the Economic Impacts of Tourism

We have been in discussion with a number of local authorities who want a cost-effective way of measuring both the direct and flow-on impacts of tourism in their area. In this section we describe two methods of establishing direct impacts, give the source of approximate multipliers, and provide copies of the most recent questionnaires we have used to derive our results.

The two approaches to estimating visitor impacts are:

- Direct surveys of visitor spend, and
- Direct surveys of business employment and financial ratios.

Both need to be combined with estimates of employment to output ratios, and value added to output ratios, to give the whole range of direct impacts which included output, employment and value added.

Surveys of Businesses

The process is to identify business' which are likely to sell directly to tourists and to ask two questions and make one calculation:

Specific Steps in Business Survey Method

1. Ask business “How many people work in this business (FTEs per year on average)?;
Busy season: - How many months
 How many full time workers on average (include owner-operator)
 How many part time on average
Quiet season: - How many months (12 – busy months)
 How many full time workers on average (include owner-operator)
 How many part time on average?”
2. Ask business “What proportion of your sales are to visitors?”
3. Multiply (1) x (2) for each business and then add together all businesses. This gives direct FTEs in each industry type selling to tourism.
4. For each industry type estimate output and value added per FTE. Use either a specific survey of business in the region, or use national average data from Statistics New Zealand surveys. Using the FTEs in tourism estimated in step 3 above, calculate value added and output in tourism for each industry type. Sum over the industry types to get total output and value added in tourism.

Strengths and Weaknesses of Business Survey Method

This method provides good measures of direct employment in tourism by industry type, but does not provide a good measure of output or value added, unless it is supplemented by a survey of businesses in the region to estimate value added and output per FTE. The method is only appropriate in reasonably small regions where it is practical to visit every business selling directly to visitors and where businesses have a good feel for whether their customers are visitors or locals. The method worked well in Kaikoura and Westland, but was more difficult in Rotorua

because City retailers had little idea of the proportion of visitors to residents, and because it was hard to identify all the potential tourism businesses.

The survey to estimate direct employment costs under \$5,000 in a small – medium sized centre, because it is possible to survey around ten businesses per hour. The survey to estimate value added and output per FTE is considerably more expensive and costs around \$15 - 20,000 (it takes at least two hours contact time per business as well as a lot of coding and analysis, and typically there need to be 30 – 40 surveys in a small centre), but has the advantage of giving information which enables the calculation of regional multipliers. Note that this latter survey is not an essential part of the business survey method, but as discussed in the report proper, it makes the estimates of output and value added much more accurate.

Survey of Visitors

Undertake a survey of visitors to establish expenditure per visitor (per visit for day visitors, or per night for overnight visitors) for each visitor type. The visitor types include domestic day, domestic overnight, international day and international overnight. Total expenditure can be assessed by rating up expenditure by the number of visits (day visitors) and visitor-nights (overnight visitors). A visitor survey form is at the end of this Appendix.

Establish total visitor numbers on the basis of the Commercial Accommodation Monitor, the International and Domestic Visitor surveys⁴¹, and the ratio of visitors in commercial accommodation to non-commercial accommodation as well as the ratio of day visitors to overnight visitors. The most appropriate data to use will depend on the centre size.

Scale up the above data to estimate total visitor spending by industry type. Use employment per \$ million sales and value added to sales ratios from either regional surveys or available national data⁴² to estimate value added and employment in the industry types. Sum over the tourism sub-sectors to get direct employment and value added in tourism.

Specific Steps in Visitor Survey Method:

1. Survey to find spend per visit / night for each visitor type. Preferably survey around 1,000 visitors with the surveys spread through the year, and samples weighted towards the busier periods.
2. In the same survey establish ratios of:
 - International day to international overnight in commercial accommodation;
 - International overnight in non-commercial accommodation to international overnight in commercial accommodation;
 - Domestic day to domestic overnight in commercial accommodation;
 - Domestic overnight in non-commercial accommodation to domestic overnight in commercial accommodation;
3. Establish the ratio of domestic to international visitor-nights in commercial accommodation. For TLAs and even smaller areas (e.g., Akaroa urban area) this ratio is not generally available in published form, but can be found out by contacting Statistics New Zealand. It is

41 Data can be obtained from: www.trenz.govt.nz.

42 For example 'Business activity frameworks' from www.stats.govt.nz.

unwise to use the published regional average ratio as a proxy for the sub-regional ratio because the two can be very different.

4. Obtain the total visitor-nights by origin (domestic/international) in commercial accommodation in the region of interest for the most recent year from the Commercial Accommodation Monitor. Data are published on the Statistics NZ web site (www.stats.govt.nz) for TLAs, but is also available for specific areas (e.g., Akaroa urban area) on request from Statistics New Zealand. This same source will also give employment (FTEs average over every third month in the year). The employment data are also available on the Statistics New Zealand web site, but currently only at the regional level and not the TLA level.
5. Use the data in (4) and (5) above to estimate the total annual visitor numbers by type.
6. Multiply the number of visitors in (5) by the expenditure per visitor in (1) to get total expenditure by visitor type by tourism sub-sector. Add the visitor types together to get total visitor expenditure by tourism sub-sector.
7. Check the ratios in (2) and (3) and the numbers in (5) above by using data from the DTM and the IVS, provided that the samples from these surveys are large enough. For small centres, the samples from the DTM (and the IVS) are likely to be too small to give reliable totals or ratios and should not be used. For large centres such as Christchurch, the IVS and DTM data are preferred to give the number of day visitors and guest nights. This is because surveying in large centres is likely to be biased by the choice of survey locations. (Those sites frequented by international visitors and those in commercial accommodation may not be visited nearly as often by domestic visitors or those staying either long term or in non-commercial accommodation.)
8. Check the results for employment in the accommodation industry (which is almost 100 % tourism) against the estimates of employment in that industry contained in the Commercial Accommodation Monitor and in Statistics New Zealand Business Survey.

Strengths and Weaknesses of the Visitor Survey Method

The survey of visitors is more accurate than the survey of tourism businesses for estimating visitor expenditure in both small or large centres, and is probably also more accurate for estimating tourism employment and value added in large centres. Large centres are likely to have employment to output and value added to output ratios which are similar to national averages, whereas in small centres this might not be the case.

The weakest part of the visitor survey method is the difficulty in establishing total visitor numbers by visitor type. It is also necessary to survey a large number of visitors to get reliable estimates of average expenditure per person. The survey cost is about \$5 per visitor, or \$5,000 for a sample of 1,000.

In small centres the estimates of employment and value added are also unreliable unless businesses are surveyed to find out their value added to output and employment to output ratios. As described above, this costs around \$15 - 20,000.

Estimation of Multipliers

The estimation of multipliers is expensive. As described above a survey of business expenditure will cost \$15 – 20,000 and then the information has to be incorporated into a regional economic model. For small centres with small multipliers, the costs are high for an improvement in accuracy which is unlikely to change estimates of total tourism impacts by more than ten per cent. In our view it is much more cost effective to use a typical GRIT approach to estimate multipliers. The cost of this is likely to be around \$2 - 3,000. At present both Butcher Partners Limited in Christchurch and Market Economics Ltd in Auckland provide impact multipliers to order.

Appendix 2

Error Margins

The estimates of visitor spending and multipliers all have margins of error. Errors in any particular sector are likely to be greater than errors in the combined tourism sector since some errors will be off-setting.

The most serious source of error in small centres is probably in the estimation of total visitor numbers, particularly domestic day visitors. This is because the estimates rely on a survey which has a large number of respondents at the national level but only a small number of respondents who have been to small destinations such as Akaroa. A survey which establishes both expenditure per person and the type of visitor (origin, whether day-visitor or overnight visitor, and whether staying in commercial accommodation or not) is essential to provide an estimate of day visitors and total overnight visitors. We are not able to measure the error margin of our sample. We know that we surveyed some 500 people in Akaroa out of an annual visitor number of perhaps 200,000 visitors per year. While the small size of Akaroa means that almost all visitors come to the foreshore at some time, hence ensuring that we are sampling the entire visitor population, we also know that the mix of visitors varies according to the time of year. Our sample covered only two weeks within this period.

We were particularly concerned to discover during the course of this project that two approaches to measuring visitor nights in Christchurch, both of which begin from common information on the number of international visitor arrivals, should give different results. The difference between the two results of the two approaches is 18 per cent in terms of international visitor nights and seven per cent in terms of tourism economic impacts in Christchurch, and both approaches also have various survey error margins which increases the potential discrepancy still further. We think it is extremely important that the debate as to the correct measure of visitor nights be resolved and this should remove the variation we noted between figures quoted in different documents. We even noted one document referring to "Canterbury including Christchurch" which seemed to be referring to Christchurch only.

Estimates of visitor spending are affected not only by sampling errors but also by recall errors. Interviewers reported that probing questioning (what did you do last night ? where did you have breakfast ?) led to higher estimates of spending than questions that simply asked for spending in the last 24 hours. In spite of our attempts to uncover all spending, we suspect there is under-reporting in most areas apart from accommodation (which most people can clearly recall). It was pleasing to note that our direct estimates of visitor accommodation spending and employment were within ten per cent of independent estimates made by another process. This gives us some confidence that our estimates of total economic impacts are within 10 – 20 per cent of actual values, although there is no way of validating this in areas other than accommodation employment.

Surveys

We believe that our switch to larger scale sampling and asking for expenditure only for the last 24 hours (rather than for the entire visit so far) improved the reliability of our estimates. It also made the task of interviewing far less onerous for the respondent.

We had only one person object to being asked questions about personal expenditure. Hence non-response was not a problem or a source of error.

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