Understanding Visitor Flows in Canada's National Parks: the Patterns of Visitor Use Study in Banff, Kootenay, and Yoho National Parks[1]

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Abstract: Parks Canada and its stakeholders are seeking to better understand visitors' movements, behaviour, and motives to support ecological integrity and sustainable tourism. Traditional market research describes these dimensions one at a time, but few studies have focused on the segmentation needed to addresses all three dimensions together. This study develops a complex visit typology and compares its practical value to a more common segmentation approach: visitor origin. Results suggest that both approaches have practical value, but that the post hoc visit type approach is more useful as a management tool for describing visitor movements.

INTRODUCTION

Canada's system national parks and park reserves represents thirty-nine natural areas of Canadian and global significance. The Government of Canada has given Parks Canada – the agency that manages the system – the mandate to protect these special places as examples of those natural areas for public understanding, appreciation and enjoyment in ways that leave them unimpaired for future generations.

Parks Canada has adopted the principle of ecological integrity to fulfil this broad mandate. An ecosystem is considered to have integrity "when it is deemed characteristic for its natural region" and its "native components (plants, animals and other organisms) and processes (such as growth and reproduction)" are intact (Parks Canada, 2000).

Together, the mandate and definition of ecological integrity are consistent with the definition of sustainable tourism as that which:

"...meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future... leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems." World Tourism Organization (2001)

Parks Canada is developing an integrated science strategy so that natural, social, and cultural sciences can work together in support its mandate. In the tourism area, this requires support from external stakeholders because the agency does not have jurisdiction over all aspects of a park's tourism system. An effective social science strategy will need to accommodate those perspectives, including:

- **Physical/Spatial**: Those with this perspective feel that tourism has an ecological basis, so planning should be based on spatial patterns and capacities to minimise the negative impacts of tourism on the environment. Planning is used to redirect, concentrate, or disperse visitor use to minimise impacts in sensitive areas.
- **Economic Perspective**: Those with this perspective see tourism as a means to promote growth and development. Planning emphasises economic benefits and ways to efficiently create income and employment benefits. It is seen as being equal to other industries.
- **Community Perspective**: Those with this perspective see tourism in its social and political context. The planner is a facilitator who helps host communities define desired outcomes in socio-cultural terms. Host communities – on the "factory floor" of the tourism industry – thus acquire the control they need to help balance tourism development.

Getz (1987) proposed a theoretical perspective that integrates these approaches in a way that is consistent with sustainable tourism and ecological integrity:

- **Integrated Perspective**: Tourism is a system that should offer lasting and secure livelihoods with minimal depletion of resources, degradation of the environment, cultural disruption, or social instability. Planning is integrated with other planning processes and with its own implementation.

The Tourism Optimization Management Model (TOMM) is a recent innovation that operationalizes Getz' integrated model (Manadis Roberts Consultants 1997; Jack 1999). It views tourism and visitor use as a system and seeks to optimize its outcomes based on a broad understanding of its function (McArthur, 2001).

Those with knowledge of a system's function can manipulate it in support of established aims (Bellinger *et al*, [n.d.]). In tourism, this requires an understanding of visitor volumes and visitor behaviour. Research can foster an understanding of tourist activity, the patterns in visitors' behaviour, and monitor and predict the change that tourist activity brings (Consulting and Audit Canada, 1994; McArthur, 1996).

The literature offers few studies that describe visitor use based on travel behaviour and spatial distribution (Flognfeldt, 1999). Specifically, the optimization literature does not suggest how best to describe visitor behaviour in ways that relate directly to management of outcomes. This is important for protected heritage areas, where visitors' behaviour can have significant long-term impacts on resources.

Recent literature has discussed the relative value of demographic, geographic, psychological, and behavioural segmentation bases (Moscardo, Pearce, and Morrison, 2001), but few studies have compared of the effectiveness of different segmentation solutions to respond to the challenge of optimization.

Moscardo *et al* suggest that the traditional approach uses *a priori* demographic variables, or variables that are chosen before the data are analysed. They point to numerous studies that have found significant relationships between visitors' origin and both travel behaviour and satisfaction.

While demographic descriptions are the norm, some argue, "Demography is not destiny" and advocate *post hoc* segmentation, determined by the data rather than by the researcher (Adams, 1997). These segments, then, can be described with geographic variables (Moscardo *et al*, 2001).

Regardless of the approach, effective visitor segmentation would describe visitor use reliably in several dimensions, producing segments that are:

- **homogeneous** (unique from each other, but internally consistent);
- **durable** (over an extended period of time);
- **measurable** (can be identified and counted with reasonable accuracy);
- **responsive** (a unique marketing approach required);
- **relevant** (to the organisation commissioning the research);
- **accessible** (easily reached via one or more media);
- **substantial** (large enough to warrant attention); and
- **compatible** (with existing markets) (Moscardo *et al*, 2001).

The study by Moscardo *et al* compared the value of geographic origin versus activity participation in Australia's Wet Tropics region. That study focused on visitors to the Australian rainforest, but the study's sample size was too small to make clear conclusions (n=549).

Like that study, this one compares the relative value of *a priori* visitor origin segments and a more complex *post hoc* approach to determine which is most useful from several different perspectives. The *post hoc* approach is based on 1,127 respondents':

- level of the pre-trip importance placed on different visit opportunities;
- activities in each of the parks' main visitor nodes; and
- parties' reported spending in Banff National Park.

Each base is compared against the eight criteria for effectiveness to evaluate the two segmentation approaches. It uses data collected in a study of visitors to Banff, Kootenay, and Yoho National Parks of Canada in the summer and autumn of 2000, but reports only the findings of the Banff sample.

BACKGROUND

Banff, Kootenay, and Yoho National Parks are among the country's most recognised tourist destinations. Over six million visitors from Canada, the United States, and overseas enjoy the parks each year, spending hundreds of millions of dollars in their hotels, restaurants, and stores. Yet, as representative examples of Canada's natural heritage – and as a World Heritage Site – the integrity of their resources is an national and international issue.

Last year, three organisations joined together to study visitor use of Banff, Kootenay, and Yoho National Parks: Parks Canada; Alberta Economic Development; and the Banff Lake Louise Hotel Motel Association. They wanted a single, reliable base of commercial, economic, and ecological data to describe visitors' movements in the parks and the outcomes of visitor use.

Each organisation approaches tourism in the parks from a different perspective:

- **The Banff - Lake Louise Hotel Motel Association** works on behalf of the parks' tourism industry and the communities of Banff and Lake Louise to help achieve common commercial and political goals (Banff - Lake Louise Hotel Motel Association [n.d.]).
- **Alberta Economic Development** is the provincial ministry that provides leadership for Alberta's economic development. Besides seeking to stimulate growth in the tourism industry, the ministry promotes trade and helps to attract investment in the province (Alberta Economic Development, 2001).
- **Parks Canada** is the federal agency responsible for Canada's system of national parks and national historic sites. Its mandate is to ensure the ecological and commemorative integrity of the resources in its stewardship in ways that foster understanding, appreciation and enjoyment by this and future generations. (Parks Canada, 2001).

DATA COLLECTION

The data for this study was collected in a study of visitors to Banff, Kootenay, and Yoho National Parks between June 12th and October 13th, 2000. Similar but separate research methods and instruments were used to sample from three populations:
- visitors travelling as part of a commercial tour, including those in motor coaches and vans;
- those travelling via scheduled carriers (trains and buses); and
- independent visitors (those travelling in personal vehicles, on foot, or by bicycle).

Brief personal interviews with a randomly selected sample of group leaders established population parameters (available in English and French; park residents, employees, and commuting workers were excluded from the sample). A mail-back questionnaire collected more detailed information from selected respondents (available in English, French, German, and Japanese).

This paper focuses only on independent visitors to Banff National Park. These results are based 5,405 personal interviews and 1,127 returned questionnaires (representing 41% of those who were given a form).

Results were weighted to correct for response bias by origin (local residents were under-represented in the up to the questionnaire) and to reflect the number of visitor party entries by gate and date. Thus, all results are presented as the actual number of independent visitors (or visit parties, where noted).

HYPOTHESIS

This study uses a null hypothesis: *A priori and post hoc segmentation will be equally useful as market segmentation techniques.*

If there are no significant differences in usefulness, the results will suggest that traditional segmentation bases – like origin – can represent the complexity of visitor use.

But if the null hypothesis is rejected – and one type is shown to be more useful than the other –then that approach may be a useful tool for:
- defining a complex tourism system;
- helping stakeholders understand the outcomes of that system and the relationships between those outcomes; and
- helping them cooperate in support of sustainable tourism.

RESULTS

Defining A Priori Segments: Visitor Origin

Visitors' origins were divided into seven categories that reflect the proportions of visitors by origin in previous research in the parks (see Figure 1). Because the survey's unit of analysis is the visit-party, one questionnaire was distributed to each party in the sample. For this reason, Figure 1 also shows the origin of survey respondents.

The two are similar enough to be considered the same, so this paper will substitute respondent origin for visitor origin.

Defining Post hoc Segments: Visit Types

To develop meaningful visit types, three types of information were analysed:
- importance of 16 visit opportunities to respondents' visit decision;
- their reported activities in each of the parks' visitor nodes; and
- reported spending in Banff National Park.

The segmentation was a multi-step process. First, a principal component analysis was applied to the respondents' reported importance levels. It used a varimax rotation and component scores were calculated for the rotated components. Then a hierarchical cluster analysis was applied to the components score using Ward's clustering method with squared Euclidean distances. A three-cluster solution was selected based on the agglomeration schedule. Finally, the cluster centres from this solution were used as initial clusters for a 3-cluster, k-means cluster analysis.

	Origin of all Visitors**		Origin of Respondents++	
Visitor Origin	**Estimated Number of Independent Visitors**	**Pct. of Visitors**	**Estimated Number of Independent Visit Parties**	**Pct. of Visit Parties**
Alberta	336,774	21.4%	112,300	20.6%
Other Canada	275,064	17.4%	93,260	17.1%
U.S.A.	523,669	33.2%	195,024	35.7%
U.K.	94,063	6.0%	38,376	7.0%
Germany	115,573	7.3%	40,005	7.3%
Other Europe	85,729	5.4%	18,288	3.3%
Other International	57,970	3.7%	34,239	6.3%
Unreported	88,400	5.6%	14,841	2.7%
Total	**1,577,242**	**100.0%**	**546,333**	**100.0%**

** The survey asked for the origin of each visitor in the party. The first two columns illustrate the origin of all visitors in the surveyed parties, weighted up to the estimated number of parties.
++ One respondent (over the age of 16) was randomly selected from each visit party to answer on behalf of the group to minimize response bias on the basis of origin, age, and sex.

Figure 1: Origins of Visitors and Respondents

Visit Type	**Est. No. of Independent Visit Parties**	**Pct. of Independent Visit Parties**
Getaway Visit	241,462	44.2%
Comfort Visit	188,656	34.5%
Camping Visit	116,215	21.3%
Total	**546,333**	**100.0%**

Figure 2: Visit Types

	Visit Type							
	Getaway Visit		**Comfort Visit**		**Camping Visit**		**Total**	
	Est. # of Parties	**% in Type**	**Est. # of Parties**	**% in Type**	**Est. # of Parties**	**% in Type**	**Est. # of Parties**	**% in Type**
Alberta	102,537	42.5%	2,721	1.4%	7,043	6.1%	**112,301**	**20.6%**
Other Canada	51,358	21.3%	22,441	11.9%	19,461	16.7%	**93,260**	**17.1%**
U.S.A.	59,583	24.7%	96,296	51.0%	39,145	33.7%	**195,024**	**35.7%**
U.K.	10,388	4.3%	22,326	11.8%	5,662	4.9%	**38,376**	**7.0%**
Germany	4,830	2.0%	10,400	5.5%	24,775	21.3%	**40,005**	**7.3%**
Other Europe	978	.4%	7,496	4.0%	9,814	8.4%	**18,288**	**3.3%**
Other International	6,395	2.6%	18,752	9.9%	9,091	7.8%	**34,238**	**6.3%**
Total	**241,462**	**100.0%**	**188,657**	**100.0%**	**116,214**	**100.0%**	**546,333**	**100.0%**

Figure 3: Relationship between Visitor Origin and Visit Typ

The resulting segments are presented in Figure 2 and are briefly described below:

- The largest proportion of park visits are categorised as **Getaway Visits** (44%). These are often day trips or 2-3 day visits that that tends to focus on a specific activity or area.
- About one-third (35%) of the visits are categorised as **Comfort Visits**. These visits tend to use the parks' hotels and restaurants... and its visitors spend the most money.
- The final visit type is **Camping Visits**. In addition to its range of accommodation and restaurant opportunities, the parks offer an ideal destination for camping and recreational vehicle touring.

A chi-square analysis suggests that visit type and respondent origin are strongly related (p=0.000, Goodman Kruskal tau = .209; see Figure 3). Getaway visit type parties are mainly from the host Province of Alberta, neighbouring British Columbia, and bordering American states. Half of the Comfort visit type parties are from the U.S.A.,

with almost no parties from the Province of Alberta. Finally, the Camping visit type is about one-third American (34%) but features a disproportionately large number of German visitors (21%).

Comparing the Two Segmentation Approaches

The variables selected for the comparison were selected for their relevance to the three funding partners for the study. Together, these organisations represent the interests of many of the stakeholders in the park's operation. The variables put into the analalysis are:

- party-visit spending in Banff National Park
- importance to visit decision of opportunities to learn about Canada's natural and historic heritage; and
- propensity to stay in a hotel, motel, or bed and breakfast facility while in Banff National Park.

Table 4 compares the overall results, results for each segmentation approach, and statistical analysis for each item.

Party Visit Spending in Banff National Park

Visitor spending is the basis for analysing the economic impact of tourism and visitor use. This is essential information for stakeholders who wish to understand the economic dimension of visitor use.

Visitors were asked for the total amount (in Canadian dollars) their party spent in Banff National Park during their current visit, including taxes, tips, and prepaid expenses, using cash, credit card, and debit card. They were then asked to indicate the proportion of this total that was spent in each of nine categories. Note that only the aggregate total is used in this analysis.

International respondents report the highest party spending, except for German respondents. Albertan respondents report the lowest amount. The differences are statistically significant, and ETA squared results suggest that visitor origin explains 11.2% of the variance in spending.

Using the *post hoc* approach, Comfort Visit parties report the highest party spending. Albertan respondents report the lowest amount. The differences are statistically significant, and ETA squared results suggest that visitor origin explains 17.6% of the variance in spending.

Thus, for spending, results suggest that the *post hoc* visit type segments explain more of the differences between respondents.

Importance of Opportunities to Learn About Canada's Natural and Historic Heritage

Parks Canada manages special examples of Canada's heritage for public benefit, including public understanding, appreciation, and enjoyment of their significance. The agency wishes to better understand the importance that visitors place on learning to address the mandate in a client-focussed manner.

Visitors indicated the importance of 16 different opportunities on five-point scales where 1 was "Not at all important" and 5 was "Very important". Two of the opportunities relate directly to the Parks Canada mandate: opportunities to learn about Canada's natural and historic heritage. Some other items on the list include: opportunities to enjoy time with friends and/or family; see wildlife in its natural environment; and mix outdoor experiences with modern comforts.

Results suggest a significant relationship between both items and the *a priori* origin segments. European respondents from outside Germany report the highest importance scores for historic heritage, while all others report similar levels of importance. The ETA squared results suggest that origin explains only 1.8% of the variance. International visitors – especially those from Germany – report the highest scores for opportunities to learn about Canada's natural

heritage, whereas North Americans report relatively low scores. In this case, origin explains 13.5% of the variance.

Using the *post hoc* approach, the segments report similar levels of interest in opportunities to learn about Canada's historic heritage. The differences are statistically significant, but visit types explain less than 1% of the variance. There is a more pronounced difference for the importance of learning about Canada's natural heritage, but the segments explain only 1.5% of the variance.

Thus, for the importance of learning opportunities, the *a priori* origin segmentation explains is more effective.

Propensity to stay in commercial accommodation

The survey asked visitors to list their specific activities in each of the park's visitor nodes.

The *a priori* origin approach illustrates significant differences, with the segments explaining 10.8% of the variance. International respondents report the highest propensity, although German respondents are only slightly higher than Canadians.

The *post hoc* visit type approach also shows significant differences, although the segments explain 24.5% of the variance. Not surprisingly, Comfort Visit parties report the highest propensity to use commercial accommodation and Camping Visit parties report the lowest.

Thus, for spending, results suggest that the *post hoc* visit type segmentation explains more of the differences between respondents.

Assessing the Value of Each Approach

The findings support those of Moscardo, Pearce, and Morrison (2001), that each approach has its merits. This section compares the two approaches to the eight criteria established in the introduction.

Homogeneous: Both approaches develop distinct segments with little internal variation. The origin approach was more effective for visit motives, but neither approach explained much variance. The visit type approach explained more variance for spending and hotel use. Moscardo *et al* also had mixed findings, although in different areas. That study found that activity-based segments were more useful for describing participation, interests, and image; but that origin was more useful for describing transportation used, age, party composition, and visit history.

At first, the visitor origin approach seems to be more **durable** and **measurable,** as most people change residence infrequently and residence data are simply captured and objectively reported. Visit types, on the other hand, are based on more data and the analysis is subject to judgement.

Mean Party Visit Spending
Overall Mean = $698   Standard Deviation = $1,122

	Mean	S.D.		Mean	S.D.
Alberta	$164	$424	Getaway Visit	$290	$474
Other Canada	$411	$578	Comfort Visit	$1,308	$1,557
U.S.A.	$992	$1,300	Camping Visit	$434	$469
U.K.	$903	$651	**Sig. < 0.001 ETA squared: 0.176**		
Germany	$296	$173			
Other Europe	$674	$863			
Other International	$1,037	$1,338			
Sig. < 0.001 ETA squared: 0.112					

Importance of Opportunities to Learn about Canada's Historic Heritage to Visit Decision
1 = Not at all Important, 5 = Very Important
Overall Mean = 2.7   Standard Deviation = 1.2

	Mean	S.D.		Mean	S.D.
Alberta	2.7	1.4	Getaway Visit	2.7	1.3
Other Canada	2.8	1.3	Comfort Visit	2.8	1.1
U.S.A.	2.6	1.2	Camping Visit	2.8	1.2
U.K.	3.2	1.2	**Sig. < 0.001 ETA squared: 0.001**		
Germany	2.8	.9			
Other Europe	3.1	.9			
Other International	2.7	.9			
Sig. < 0.001 ETA squared: 0.018					

Importance of Opportunities to Learn about Canada's Natural Heritage to Visit Decision
1 = Not at all Important, 5 = Very Important
Overall Mean = 3.2   Standard Deviation = 1.3

	Mean	S.D.		Mean	S.D.
Alberta	2.8	1.5	Getaway Visit	3.0	1.4
Other Canada	2.9	1.4	Comfort Visit	3.3	1.2
U.S.A.	2.9	1.3	Camping Visit	3.5	1.4
U.K.	3.6	1.0	**Sig. < 0.001 ETA squared: 0.015**		
Germany	4.4	.8			
Other Europe	4.2	.9			
Other International	3.9	1.0			
Sig. < 0.001 ETA squared: 0.135					

Propensity to Stay in a Hotel or Motel During This Visit
Overall Propensity = 37%

	Propensity		Propensity
Alberta	12%	Getaway Visit	23%
Other Canada	22%	Comfort Visit	74%
U.S.A.	48%	Camping Visit	6%
U.K.	66%	**Sig. < 0.001 Goodman & Kruskal tau = .245**	
Germany	27%		
Other Europe	41%		
Other International	57%		
Sig. < 0.001 Goodman & Kruskal tau = .108			

Figure 4: Comparing Geographic and Visit Type Segments

Note, however, that the same visit types emerged independently in both the summer and autumn samples, suggesting that the visit type approach has some stability. And the stability of the visitor origin approach may be questioned, since Calgary is one of Canada's fastest-growing cities (changing in size and composition); the proportion of international visitors to the park has grown significantly in the past decade; and events like those on September 11th can quickly change a market's composition. Visitor origin has an advantage, but not by a wide margin. This supports the findings of Moscardo *et al*.

Responsive: The findings suggest that the most useful approach depends on the situation. The visit type segments explain much more behavioural variance and origin segments may possibly respond better to messages based on visit motives (although neither approach explained more than 10% of the variance). Findings suggest that pre-trip information could be targeted at geographic segments with messages that reflect their unique interests patterns, but that activity information is best targeted to on-site visit type segments. This differs from the findings of Moscardo *et al*, who found that activity-based segments explained more motive variance.

Relevance is in the eye of the beholder. Those who wish to appeal to visitors' interests may be best to pursue origin segments, but those interested in visitors' activities in the park – and their movements through it – would find more value in the visit type approach. Strategies to influence the tourism system may investigate similar *post hoc* approaches. Moscardo *et al* came to a similar conclusion, but for different reasons. In that study, activity segments were better predictors of visit motives.

Accessible: Without these findings, visitor origin segments seem more practical for pre-trip and en route information and for building awareness. But with the results, it is clear that visit type segments are accessible – and more useful – for targeting on-site activity information. Results suggest where to find each segment, and which activities to target. Moscardo *et al* suggested that visitor origin segments were generally more accessible.

Substantial: Both approaches provide segments that are large enough to warrant attention. In recent years, data miners and proponents of 1:1 marketing have suggested that new models may render this criterion obsolete. Many successful enterprises cater to individuals or to very small niches, or create new segments when the opportunity is truly unique (Behrens, 1987). But, when faced with a need to describe the outcomes of visitor use, market segmentation is still an appropriate activity. This supports the findings of Moscardo *et al*.

Assessing **compatibility** is beyond the scope of the variables used for this paper, although the survey did include items to help assess this criterion (*e.g.*: desire for solitude versus desire for companionship). Moscardo et al did find support for their activity-based segments on this criterion.

SUMMARY

Visit type segmentation was more useful for predicting variables of relevance to the development of park tourism and management of its facilities. It should be more useful to managers who wish to assess the size, competitiveness, and compatibility of segments within the market. They were also shown to be relatively stable and reasonably accurately measured.

The visitor origin segments performed well on accuracy of measurement and pre-trip accessibility. They were also related to participation in specific activities, but less than visit types.

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