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**Tourist price sensitivity and the elasticity of demand: The case of BC ferries**

This paper explores how transportation pricing can influence tourist decisions. After a double price hike within a year on a major mainland-island ferry route in Western Canada, the current study examined tourist demand [price elasticity] in the face of future price change. The research estimated demand with several price increase/decrease scenarios. Results suggest local pleasure travellers are highly price-sensitive, and that changes to ferry fares can lead to a two or three fold change in demand for that service. The implications of this for the island's tourism industry are discussed along with several strategies the destination undertook to reduce visitor sensitivity.

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## Introduction

Islands have distinctly different tourism issues to face when compared with mainland destinations (Smith, 1987; Conlin & Baum, 1995). Of these issues, transportation is considered key to island tourism's success. Without a choice of options, good scheduling and reasonable prices an island's competitive position will soon erode regardless of its individual attractions (Bertrand, 1997; Page, 1999). Unfortunately for many islands the cost of transport is steadily rising, as governments reduce subsidies and operational costs rise. A growing concern for island destinations is just how price sensitivity tourists are becoming, whether certain promotional strategies can counter the apparently inevitable increase in price. The purpose of this study is to explore what can happen when a major island tourism destination faces changes to its ferry price structure and how tourists are likely to respond (Murphy & Pritchard, 1997). The study involves ferry travel to Vancouver Island, off the coast of western Canada, and examined the elasticity of demand tourists expressed about a proposed *price increases* (Crouch, 1994).

## Vancouver Island Situation

In 1997-98 B.C. Ferries (a public Crown Corporation) increased ferry fares between Vancouver Island and the mainland (Vancouver area) twice, and thanks to declining government subsidies a third increase was also planned in the near future. The impact on tourist travel to the island was immediate according to secondary data sources. The regular exit surveys conducted by Tourism Victoria in 1997 showed 60 percent of visitors rated their trip to Victoria as "very good" or "good" value for money, which was actually a small increase over the previous year. But, of the recorded negative comments one quarter were related to ferry service and prices. Consequently, it was felt a study was needed to directly assess how elastic tourist demand was for travel to Vancouver Island.

## Price Elasticity

The concept of price elasticity deals with how responsive consumer demand is to a change in price. If a price increase occurs (P1 to P2), a corresponding change in demand (Q1 to Q2) may occur. If demand hardly varies with a change in price, we say that demand is inelastic. If demand changes greatly, we say the demand is elastic (Kotler, Bowen & Makens, 1996, p.387).

Ratio used to determine price elasticity:

$$\frac{\% \text{ change in quantity (Q) demanded}}{\% \text{ change in price (P)}} = \text{price elasticity}$$

The ratio compares the proportion of change in demand with the proportion of change in price. For example if demand falls by 5% with a 5% increase in price, then the elasticity ratio is  $-1.0$ . In this case the seller's total revenue stays the same, with 5% fewer items sold at a 5% higher price preserving the same total revenue. Elasticity ratios  $\leq 1$  typify inelastic demand, whereas ratios  $\geq 1$  underscore an elastic response and a price sensitive market <sup>1</sup>(Yoon & Shafer, 1996).

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<sup>1</sup> \* absolute value.

## **Study**

A study was commissioned by the British Columbia Hotel Association in early 1998 and conducted by the Tourism Management Department of the University of Victoria's Faculty of Business. The study involved a mail survey of 448 mainland B.C. residents. Initially, 51 percent of the sample (n= 230) completed surveys, however, a further 8 respondents failed to qualify as pleasure travellers. The questionnaire asked several related questions concerning price sensitivity to associated trip expenses, such as accommodation, attractions and meals before focussing on the respondents' specific reaction to two transportation price scenario questions. They were asked what their reaction (projected # of trips that year) would be in light of a 20 percent decrease or increase in ferry fares.

## **Survey Results**

The demographic and travel behaviour characteristics of the sample was similar to the domestic tourist profile that has emerged over the past ten years in Tourism Victoria's annual exit surveys. The sample responses indicated most tourists took pleasure trips to Vancouver Island between July and September, they made 3.1 round trips a year on the ferry system, their pleasure trips generally lasted 3 days, their average annual household incomes were in the \$50,000 - \$59,999 range.

Furthermore, a breakdown of their typical trip expenses to Vancouver Island produced a per diem expenditure of C\$251.16 which closely approximates the figure of C\$240 per day produced by the previous Tourism Victoria exit survey (Tourism Victoria, 1996).

In terms of their general price sensitivity to a Vancouver Island visit most found it offered a good or acceptable value. Where their assessments were recorded on a scale of 1 representing very good value through to 5 representing very poor value, all the principal ingredients of a visit were in the 2-3 range (Table 1). However, it is noticeable that the poorest value rating was for ferry transportation. This confirms that it was a marketing issue at the time of the study, and supports the more individual responses outlined in Table 2.

Insert Table 1

Table 2 refers to the respondent's individual perception of the relative importance of various trip components to their overall trip planning. It is notable that their highest concern involved the cost of the ferry trip to Vancouver Island, followed by the overall anticipated costs. Thus for the individuals concerned the most immediate factor in travelling to Vancouver Island was the transport costs to the island. This confirms the findings of previous tourism studies which show for many prospective tourists it is the cost of transportation that represents a foremost hurdle which needs to be considered before any travel decision is made (Stevens, 1992).

Insert Table 2

When the respondents were asked about a 20 percent increase in ferry prices, 60.7 percent said it would lead to a decrease in travel between the mainland and Vancouver Island [Figure 1]. For 33.9 percent it would mean a "significant decrease" in the number of trips taken. However, overall the anticipated reduction in round trips would be 1.4 trips on average (st. dev. = 1.66). It was felt that these reactions to a price increase would be

related to the respondents' level of income. Income levels were thought to influence tourist responses to the projected price increases, but a one-way ANOVA revealed no such relationship.

Insert Figure 1

When the respondents considered a 20 percent reduction in ferry prices, 66.2 percent said they would increase the number of trips taken [Figure 2]. On average, the estimated number of annual trips increased by 1.9 trips (st. dev. = 1.65). In this case the number of respondents making a positive adjustment was higher than the negative adjustment in Figure 1, but most of the respondents anticipated a more moderate change compared to the more drastic changes associated with a price increase. However, the change in number of round-trips was higher than in the case of higher fares, with two extra trips predicted if prices were lowered by 20 percent.

Insert Figure 2

If the responses to the two price situations (shown in Figures 1 & 2) are examined together it is apparent that the demand for ferry travel is elastic, but not uniformly so. Price elasticity ratios, when calculated using the formula below (Kotler et. al., 1996, p. 387), compare the proportion of change in demand with the proportion of change in price. For example if demand falls by 5% with a 5% increase in price, then the elasticity ratio is  $-1.0$ . In this case the seller's total revenue stays the same, with 5% fewer items sold at a 5% higher price preserving the same total revenue. Elasticity ratios of  $1^*$  or less typify inelastic demand, whereas ratios  $> 1^*$  underscore an elastic response and a price sensitive market (*\*absolute value*).

Insert Figure 3

Figure 3 shows how the 20 percent fare decrease would raise the number of trips across the Strait of Georgia from the current number of 3.1 round trips a year they made last year to 5.1, and a 20 percent fare increase down to 1.7 trips a year. A slightly shallower change with the increase compared to the decrease. When elasticity ratio's are calculated, they imply that a fare decrease (*ratio* =  $+3.01$ ) is likely to produce greater positive change than the negative impacts associated with a price increase (*ratio* =  $-2.24$ ). This inconsistency does raise an initial question about response bias and the internal validity of tourist estimations. However, the contrast also holds intriguing possibilities for price promotion, as future subsidies in the form of a price decrease may stimulate demand to the point where an overall increase in revenue would more than cover the cost of the promotion. A breakeven analysis would be required here for the ferry service to accurately determine when the necessary level of demand had been reached.

### **Strategic Responses**

The tourism industry of Vancouver Island was sufficiently shaken by the outward signs of a downturn that they have undertaken several strategic responses. An immediate short-term response was the lowering of other visitor costs such as accommodation rates. This response was the first interim measure taken before four long-term strategies could be implemented by the local industry. The first long-term strategy undertaken emphasised marketing the ferry trip as part of the overall island experience, and highlighted the island scenery and wildlife (e.g., seals, bald eagles and whales along the way). The second

strategy to counter rising ferry fares promoted a new special event/attraction (i.e., the Leonardo da Vinci exhibition in Victoria's Royal BC Museum) to raise the competitive appeal of the island. Another strategy sought to develop the package market (e.g., Yoon & Shafer, 1996). This used a more expensive high-speed ferry system to link Victoria, Vancouver and Seattle together, and offer alternate packages that would appeal to other markets.

The fourth strategy used involved convincing tourists to spend longer on the island by combining a Victoria visit with travel up island. This encouraged Victoria to promote itself as a gateway to a larger island experience, and also provided a way to reduce transportation costs so that ferry fares became a smaller part of overall trip expenditure.

It should be noted that none of above strategies are new or unique to the island. But two ferry price increases in one year and the results of this survey did stimulate more action and collaboration than in the past. Although not addressed directly in this paper, the detrimental effect that BC Ferries price strategy had on the local tourism industry is a public policy issue worthy of discussion. While not reported in the study, the economic impact of lost visitor expenditure on the island may ultimately have cost the government more (through lost tax revenue) than it gained through a rate hike. Industry accounts of lost revenue that year were substantial. This begs the question of whether government supported transportation should operate on a "private" revenue model; the problem being that making decisions in isolation can negatively affect other government revenue streams (i.e., taxation). What's profitable for the ferry service may ultimately not be "good" business for the province.

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**Table 1 – Value for Money Mean Scores**  
Scale Range (1 = ‘very good value’ to 5 = “very poor value”)

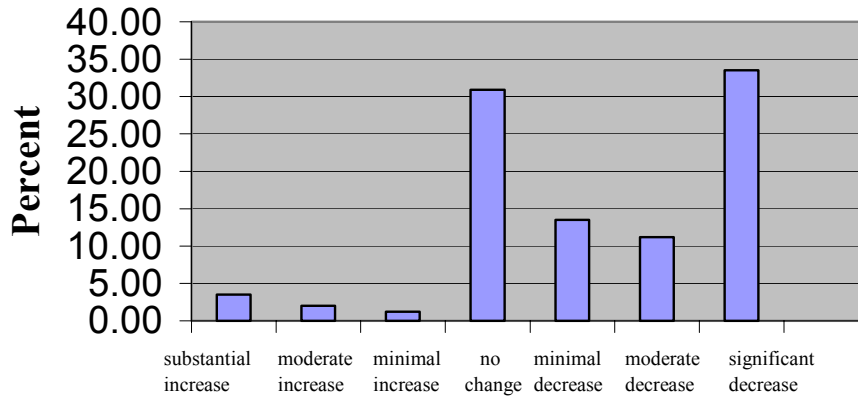
	N	Mean
Attraction and Recreation	205	<b>2.01</b>
Accommodation	202	2.19
Shopping Value	200	2.48
Restaurants	209	2.31
Ferry Transportation	216	2.57
Overall Trip	211	2.20

**Table 2 - Rank Ordered Importance of Factors when Planning a Trip**

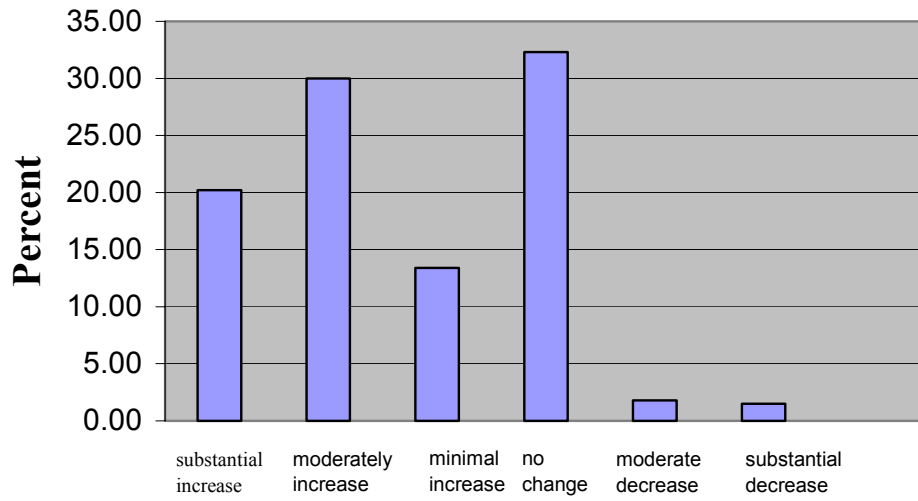
	Highest	1. Ferry Price	(mean importance = 1.99)
		2. Overall Trip Cost	(mean importance = 2.22)
		3. Accommodation Price	(mean importance = 2.72)
	Lowest	4. Restaurants Price	(mean importance = 3.23)



**Figure 1. How Does a 20% Increase in Price Affect Behavior?**



**Figure 2. How a 20% Decrease in Price Affect Behavior?**



**Figure 3. Projected & Current Ferry Demand**

