

THE ECONOMIC IMPACTS OF THE PROPOSED AMENDMENT TO THE ETS REGULATION

Prepared for:
**The Workers Compensation Board
of British Columbia**

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1.0 INTRODUCTION

On January 1 2000, the Workers' Compensation Board of British Columbia (WCB) extended its workplace smoking restrictions to include all hospitality, public entertainment, and long-term residential facilities in the province.¹ These facilities included stand-alone and hotel-based restaurants, pubs and cabarets, as well as bingo halls and the like. The rationale was that the WCB is responsible for regulating the occupational health and safety of all workplaces in the province and therefore all workers, irrespective of their place of work, are entitled to protection from environmental tobacco smoke (ETS).

The smoking restrictions were in effect for just over two-and-one-half months. At that time (March 22 2000) Justice Stromberg-Stein ruled that the WCB had not consulted stakeholders sufficiently and overturned the extension of the regulation to both hospitality and long-term residential facilities until such time that the WCB could undertake proper consultations.

The WCB is once again considering an amendment to their workplace smoking regulations. The proposed amendment would, in effect, require hospitality, public entertainment, and long-term residential facilities to control worker exposure to ETS by prohibiting smoking, restricting smoking to designated smoking areas or by other equally effective means. Prior to making its decision on whether the proposed amendment should be adopted, the WCB, as part of its review of this issue, retained Pacific Analytics Inc. to provide a report on what economic impacts the proposed amendment would have on hospitality businesses. Pacific Analytics also was asked to assess whether the proposed amendment would impact on the competitiveness of BC businesses. This study assesses the potential short-term provincial and regional impacts; the potential long-term impacts; and the impacts on BC's competitiveness should the proposed amendment be adopted. Some potential business benefits are also considered. While there are other potential benefits (e.g., health benefits to workers) this study is not mandated to estimate a cost-benefit ratio for the proposed amendment. As such, these other benefits have not been included in the report.

The approach used in this study is designed to answer the question: did the introduction of the WCB smoking restrictions between January 1 2000 and March 22 2000 impact hospitality businesses in a measurable way? The methodology is an econometric analysis based on changes in liquor purchases. It is a statistically defensible approach that quantifies the cost to business both in the short term and in the long term.

The following is an overview of the sections contained in this report. Section 2 reviews studies from other jurisdictions that have enacted no-smoking ordinances. Section 3 reviews the data sources used to estimate costs and benefits while Section 4 discusses the methodology, including a description of the model structure. Section 5 highlights trends in hospitality activity in the province. Section 6 discusses short-term provincial impacts while Section 7 reviews the short-term regional impacts. Section 8 examines the potential long-term effects of the proposed amendment. Section 9 summarizes the costs of ventilation alternatives, while Section 10 looks at the potential financial benefits to employers. Section 11 summarizes the impacts on BC's competitive position.

2.0 SURVEY OF LITERATURE

Over the past decade a number of jurisdictions in North America have passed a range of restrictive smoking regulations that have applied to hospitality facilities. Some of these ordinances have been statewide, while others have applied to a region or municipality. Similarly, the degree of smoking restriction has ranged from outright bans in all facilities serving food and/or liquor to ordinances that limit smoking only in larger restaurants. In addition, permitted alternatives for eliminating ETS are varied and include smoking rooms, high-level ventilation and simple partitioning of smoking and non-smoking areas.

¹ The extension of smoking restrictions did not ban outright all smoking. Rather, the regulation still permitted smoking in outside areas and in enclosed designated smoking areas where workers were not permitted to enter.

As a consequence of these regulations, numerous studies have been published assessing the economic impacts of these smoking restrictions. The majority are US-based studies addressing the effects on total restaurant sales and/or employment. The studies generally use one of two approaches.² The first approach is to conduct a survey (*ex post*) of owners/managers in order to determine whether sales declined after smoking restrictions were imposed.³ As pointed out by a number of critics, this methodology has several drawbacks. First, even if the choice of businesses surveyed is truly random (which often is not the case), the results are often based on the perceptions of affected owners/managers rather than actual sales figures. While the owner/managers may not be intentionally biasing their responses, under such circumstances their answers may not reflect actual experience. More important, even if business activity did decline, there may be other, perfectly valid reasons that caused sales to decline. For example, visitor arrivals may be down. Alternatively, the overall level of economic activity in the jurisdiction may be declining resulting in higher unemployment and lower disposable income. In view of these problems, then, these studies generally have not achieved any real credibility in the literature.

The second approach uses taxable retail sales data.⁴ Studies using this approach measure whether the ratio of taxable sales of the food & beverage industry to total retail sales decreases after the introduction of the smoking restrictions. If no decrease is identified, then the authors conclude that the smoking restrictions did not affect food & beverage sales. The advantages of this approach are considerable. The data used are consistent, universal and unbiased, since reporting of sales taxes is required by law for all establishments. In addition, using a ratio of sales captures other aspects of economic activity. Hence, what is being assessed is whether people are spending proportionately less in food and beverage facilities because of restricted smoking regulations.

These studies, however, are not without their detractors. A major criticism is that many of these studies combine all establishments into one group and do not recognize that some sub-sectors could be strongly affected even though in aggregate the impacts are minimal. Second, although the authors claim that the retail sales data are by region, the data are often skewed due to the presence of consolidated reporting (i.e., chain stores that report sales of all regional stores from one head office). In addition, the studies rarely examine whether the impacts are increasing or decreasing over time. Thus, even though the analysis of a no-smoking ordinance may detect no impacts over the time period the ordinance is in effect, it is possible that the impacts are becoming greater (or smaller) as time goes by.

Appendix A lists a selection of recently published studies (complete with a brief abstract) that examine the economic impacts of smoke-free legislation in the hospitality industry. While most of the studies examine impacts on restaurants only, the conclusion of all published studies that used tax data in the analysis⁵ is that smoking restrictions do not impact negatively on hospitality sales and/or on employment nor on tourism activity in the long run. The studies, however, are subject to specific criticisms.

The Hyland study⁶ of New York restaurants, for example, uses taxable sales data to conclude a neutral impact. The data, however, mix data of restaurants that are subject to smoking restrictions (i.e., those with more than 34 seats) and restaurants that are not (restaurants with less than 35 seats or which have separate bar areas and stand-alone bars and cabarets). Thus, it is possible that a migration from one establishment type to another has taken place and that restaurants under the legislation were negatively impacted. No attempt was made to split the restaurant data to test this possibility.

² A number of pre-ordinance (*ex ante*) studies attempting to *predict* the impacts have been undertaken (e.g., “The Hospitality Sector and a Vancouver Smoking Ban” prepared by CCG Consulting for the Lower Mainland Hospitality Industry Group, 1995). These studies survey patrons and businesses attempting to estimate changes in patronage by smokers and non-smokers and extrapolating to changes in food and liquor sales.

³ See, for example, Biener L et al.; Hyland A et al.

⁴ See, for example, Glantz SA et al.; Hyland A et al.; Sciacca JP et al.; Huang P et al.

⁵ There may be other studies that claim a negative impact. Some commentators have also suggested that publications have a bias in accepting papers that find no correlation and a bias against those papers that find negative impacts.

⁶ Hyland A, Cummings KM, Nauenberg “Analysis of Taxable Sales Receipts: Was New York City’s Smoke-Free Air Act Bad for Restaurant Business?”; E. *Journal of Public Health Management Practice* 5(1): 14-21, 1999

In studies by Glantz, Huang and Sciacca and others,⁷ the analyses use the proportion of restaurant sales to total retail sales in each region, and therefore they account for general economic trends as well as the introduction of the smoke-free ordinance. The results generally are unequivocal in that the statistics indicate no negative impact on the proportion of consumer spending in restaurants. The authors acknowledge that problems with grouping of establishments and the regional aspects of the data may have some effect. Nevertheless, the conclusions are so overwhelmingly against negative impacts that the conclusions are generally accepted.

While some studies have looked at employment impacts through surveys of owner/operators, several studies have used administrative data sources (e.g. Department of Labour).⁸ These studies have the same problems as those studies examining the impacts on sales in that the employment data do not identify sub-sets of restaurants. Still, the conclusions are strong, reflecting the same conclusions as the studies on sales: no impacts.

Several studies have looked at the impacts on restaurants of instituting voluntary restrictions. The Conference Board of Canada, for example, looked at 65 restaurants that voluntarily went smoke-free. Their conclusion was that “the experience of going smoke-free was a positive one for the majority of restaurants examined in this study.”⁹ The criticism, of course, is that the survey sample was not unbiased since only those restaurants that *ex anti* believed a smoke-free environment would be beneficial to their business would have undertaken voluntary smoking restrictions.

In terms of benefits to employers from adopting a smoke-free environment, the presence of persistent ETS exposure is found to increase sick-time and replacement costs for the employer. One study in Scotland estimated that absenteeism due to smoking cost employers more than £33 (~\$75) million during 1995.¹⁰ The study estimated that lost productivity due to smoking was costing employers in Scotland more than £1.2 (~\$2.75) million per day, or £292 (~\$660) million per year. The paper focuses primarily on employees that smoke, but includes productivity lost due to working in an ETS environment as well.

Finally, one study, by Glantz et al., has looked at the impacts of smoking restrictions on tourism activity.¹¹ The study found that hotel revenues and tourist visits were not impacted in California, Utah and Vermont nor in any of the 6 cities (Boulder, Flagstaff, Los Angeles, Mesa, New York and San Francisco) which restricted smoking in restaurants. Their conclusion is that smoke-free ordinances do not appear to adversely affect, and may increase, tourist business.

3.0 DATA SOURCES

In order to assess properly the impacts of the WCB smoking restrictions, it was important to utilize data that are objective, that are specific to the question being asked, and that are structured to allow a detailed look at different sub-groups and different regions of the province. While a number of different data sources were reviewed for their utility in answering the relevant questions, the following highlights the data used in this study.¹²

⁷ See Appendix A for citations

⁸ See, for example, Hyland, “Restaurant Employment Before and After the New York City Smoke-Free Air Act”

⁹ “The Economics Of Smoke-Free Restaurants”, Toronto, The Conference Board of Canada, 1996

¹⁰ Parrott, S., Godfrey, C. & Raw, M. “Cost And Benefit Analysis Of Smoking Cessation In The Workplace”. *Report for the Health Education Board for Scotland. Centre for Health Economics*, University of York, 1996

¹¹ Glantz SA, Charlesworth A. “Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances” *Journal of the American Medical Association* 281:1911-1918, 1999

¹² The WCB itself maintains a database of information on business payroll characteristics (total payroll, assessed payroll, estimated employment, etc.). Unfortunately, these data could not be used for any analysis since the information was available only on an annual basis and did not include the year 2000 for most businesses.

3.1 LIQUOR DISTRIBUTION BRANCH (LDB) PURCHASE DATA

The main source of information for this study is the Liquor Distribution Branch (LDB) database. It contains cost data for monthly liquor purchases by alcohol type (draft beer, packaged beer, wine, spirits, and cider & coolers) for each establishment (liquor licensee) in the province.¹³ The LDB codes each licensee as Hotel/Resort (A licence), Dining Establishment (B licence), Cabaret (C licence), Neighbourhood Pub (D licence), Marine Pub (F licence), and Wine & Beer (Licencee Retail) Stores (G, H licences). For the purposes of this study, Neighbourhood and Marine Pubs are combined. Other licensee types (Stadiums, Concert Halls, Winery Lounge, etc.) are not used in this study.¹⁴

These data meet the necessary criteria for an objective study:

- ◆ the data are universal rather than a sample of establishment and, as well, the data are highly accurate since they do not depend on self-reporting or on survey responses.
- ◆ the data are reported by licensee class and type. This will allow, for example, an analysis of cabarets separately from neighborhood pubs.
- ◆ the data can be coded regionally (through postal codes), enabling an examination of impacts in different areas of the province. In addition, it allows us to test the hypothesis that establishments in rural areas or close to provincial borders suffered disproportionate impacts.
- ◆ the data include sales by Licensee Retail Stores (LRS) as a separate component, enabling us to determine whether people were choosing to purchase LRS liquor for consumption at home rather than frequenting local pubs and bars.

The LDB liquor purchase data do have one drawback. Because the data are purchase data and not sales data, there is the potential for inventory build-up or draw-down in a given month. Using data from the provincial Retail Sales Tax database (see Section 3.3) for a sample of establishments in each region, we examine whether there is any statistical evidence for an inventory change in any of the months when the amendment was in effect. We also note that draft beer generally does not display swings in inventories and therefore our analysis of this alcohol type is particularly useful.

3.2 ACCOMMODATION REVENUE DATA

A second data source used in this study is the provincial Hotel Tax database. These data identify monthly taxable accommodation revenues for the province and for each Regional District from October 1996 to August 2000. The data are highly objective in that the data represent all taxable accommodation facilities in each region¹⁵ and criminal penalties are assessed for non-reporting.

Real accommodation revenues are estimated by deflating current dollar Accommodation revenues by the Accommodation Price Index component of the monthly BC Consumer Price Index (CPI). The resulting series will proxy tourist visits in each location and since liquor sales are normally quite dependent on visitors, we would expect a positive correlation between liquor purchases and real accommodation revenues.

The importance of including these data is that a change in liquor purchases may be the result of a change in tourism activity rather than due to the smoking restrictions. Including the data series will ensure that we do not misrepresent the cause of any changes in liquor purchases.

¹³ We chose to use the dollar value of purchases rather than volumes because of the problem of mixing different types of liquor (changes in the volume of wine, for example, may differ greatly from changes in the purchase cost). Since there is no available deflator for purchase costs, the study uses nominal dollar purchase costs. The short-term effects of price changes would not affect impacts for one or two months (i.e., January/February 2000). As explained in Section 4.1, the longer-term effects of price changes are captured in the Time trend variable.

¹⁴ We rely on the LDB coding of licensee types for this study.

¹⁵ Accommodation revenues stemming from bed and breakfast facilities and from visitors staying more than one month are not taxable and therefore are not included in the Accommodation database.

3.3 RESTAURANT, CATERER & TAVERN RECEIPTS

A third data source used in this study is Statistics Canada's Restaurant, Caterer & Tavern Receipts. Two sets of monthly data are used: Total Receipts in BC; and Total Receipts by Drinking Places in BC. These data are not used in the main analysis for several reasons. Primarily, the Total Receipts data include hospitality business types that would not have been affected to any degree by the WCB regulations. These business types would include fast food establishments, catering businesses, and the like. In addition, the data do not include receipts for restaurants and bars located within hotels. Consequently, the data were considered too limited for the study purposes. The second reason why the data could not be used is that the data are only available for the province as a whole. As such, it would not be possible to use the data to estimate regional impacts.

Nevertheless, the data were useful for confirming the general findings. For this, an analysis of total real dollar restaurant, caterer and tavern receipts (food, liquor and other receipts) was undertaken using the same methodology as described in Section 4.1 (see Appendix B3 to examine the detailed results). The analysis using Total Receipts resulted in somewhat smaller impacts, but as mentioned fast food outlets and caterers are included in the receipt data. The analysis using only receipts from "drinking places" confirmed the relatively large short-term impacts for those business types whose business generally is serving liquor.

Originally the hope was to use data from the monthly provincial retail sales tax database to measure the effects of the amendment on sales and to assess the level of inventory changes that may have taken place in January to March 2000. Unfortunately, estimates of hospitality retail sales by region could not be produced in time for inclusion in this study.

As described in Section 4.1, we did examine provincial impacts with and without total provincial retail sales as estimated by Statistics Canada. These retail sales data serve as a good indicator of the health of the domestic economy. Since it is possible that liquor sales deteriorated in the January 2000 to March 2000 period because of an overall decline in the economy, including this data series in our econometric equations will ensure that we do not misrepresent the cause of any changes in liquor purchases.

3.4 EMPLOYMENT INSURANCE DATA

Finally, data from Employment Insurance was obtained. These data track the level of EI recipients each month by four general occupations related to the hospitality sector: Restaurant Managers, Chefs & Cooks, Bartenders & Servers, and Kitchen Help. Although the data are not used as variables in the econometric equations, this data source is still useful. If the smoking restrictions resulted in layoffs, then one ought to expect an increase in the number of EI recipients during the period.

4.0 METHODOLOGY

While the introduction of smoking restrictions in hospitality facilities¹⁶ may have many health and social benefits, it is not clear whether such regulations will impact negatively the financial health of hospitality businesses whose clientele are often smokers. As part of its review of the proposed amendment to extend smoking restrictions to hospitality establishments, the WCB wished to examine in more detail what these impacts might be. In attempting to measure these types of impacts both in BC and in other jurisdictions, a variety of techniques have been used that have specific difficulties. The most common of these problematic approaches are outlined below:

- ◆ **anecdotal reports:** verbal remarks from adversely affected owners is often cited as evidence that no-smoking regulations hurt hospitality sales. However, this information may be biased, since those unfavorably affected by a policy are usually more vocal than those who are relatively unaffected. This is not to say that anecdotal reports are untrue, only that anecdotal evidence tends to overstate the negative impacts of a policy.

¹⁶ For the purposes of this report, hospitality facilities are comprised of liquor-serving restaurants, bars, pubs (neighbourhood and marine) and cabarets, both stand-alone and located within hotels. The impacts on non-alcohol serving establishments such as fast food restaurants, bingo halls, etc. are not assessed in this study.

- ◆ **business surveying:** surveys of affected businesses is another technique used. While a properly designed and implemented survey can provide reliable information, this type of evidence frequently relies on statistical surveys that, either by design or through poor administration, over-represents adversely affected businesses. The result often is “statistical” proof of the adverse impacts of a policy where no evidence really exists. From a user perspective, then, it is imperative that studies using this technique clearly present its survey design and method of implementation.
- ◆ **data mining:** this approach selects information/data that supports a particular point of view while ignoring similar information/data that is prejudice against the view. Examples may include citing data for a particular month that confirms the particular view while ignoring another month that confirms the opposite view. Alternatively, evidence that one business sector is not affected may be used to suggest that all business sectors are equally unaffected.
- ◆ **use of aggregate data:** aggregate measures of activity often include data and/or changes in activity that are not relevant to the issue under consideration or that mask the effects on sub-groups. This could happen if say, sales by Licensee Retail Stores are included in Total Sales figures and used to deny a drop in establishment sales. Alternatively, citing data that shows that overall provincial impacts are negligible does not in itself prove that the impacts in a particular region are also nil. Hence, using such aggregate measures can lead to an incorrect interpretation of the impacts.

The approach we take in this study is designed to answer the question: did the introduction of the WCB smoking restrictions between January 1 2000 and March 22 2000 impact hospitality businesses in a meaningful way? The methodology is an econometric analysis based on changes in liquor purchases. It is a statistically defensible approach that quantifies the cost to business, both in the short term and in the long term. This technique provides a superior, though not perfect indicator of the impacts on hospitality businesses specifically because it takes into account other factors that may affect business sales. The methodology uses detailed establishment-level information and develops econometric equations that estimate explicit values for the impacts and, as well, includes levels of confidence for these estimates (see the next sub-section for a description of the econometric model used).

For some establishments, liquor is the basic item for sale and the impacts measured will very closely mirror the impacts on actual sales or revenues. For other establishment types, food is an integral part of their service. Anecdotal evidence suggests that food consumption, especially in bars and pubs, has increased due to no-smoking regulations. Unfortunately, it is not possible in this study to determine whether food sales were negatively or positively impacted. As a consequence, the results identified in this report for food-serving establishments (e.g., dining establishments) should be used with some caution.

4.1 THE MODEL

Liquor purchases could be influenced by many factors: the time of year, how well the local economy is performing, how many tourists there are, whether there is a smoking restriction in place, etc. An econometric model is an equation that is designed to estimate quantitatively the importance of each of these influencing factors and to assign a level of confidence for each.

In order to estimate the effects, our analysis uses monthly data¹⁷ and applies an Ordinary Least Squares (OLS) regression model of the form:¹⁸

¹⁷ Monthly rather than quarterly data are used since the amendment was in effect for less than one quarter. If quarterly data were used, then the impacts of March would confound the impacts of January and February when the amendment was in full effect.

¹⁸ For estimating the Provincial impacts, an additional model is used that includes the variable $B18 * \ln(R_Sales)$. This variable (monthly provincial Retail Sales) captures changes in the domestic economy. If the coefficient $B18$ is significant and/or the inclusion of the variable materially changes the values on the other coefficients, it is fair to say that changes in the domestic economy did influence liquor purchases during the estimation period (Oct 1996 to August 2000). We have included this additional model because we were unable to obtain regional retail sales data. If retail sales prove not to be significant at the provincial level, then we feel greater confidence that the lack of regional retail sales does not affect the regional equations.

$$\text{Ln}(Y) = B0 + B1*\text{Jan} + \dots + B11*\text{Nov} + B12*\text{Time} + B13*M1 + B14*M2 + B15*M3 + B16*\text{NewYear} + B17*\text{Ln}(R_Tour)$$

Y is the monthly dollar value of purchases for the particular liquor type (e.g., total purchases, draft beer, etc.) for each type of business (e.g., pub). For the provincial analysis, establishments located in the CRD are excluded since that region already had a total smoking ban put into effect on January 1st 1999. For the regional analysis, the data are broken down by the 8 Development Regions¹⁹ and the 28 Regional Districts. **Y** is evaluated in LOG form so that the values of the coefficients (*Betas*) can be interpreted as percent changes in purchases.

The coefficients *B1* to *B11* capture January to November monthly seasonal variations in purchases relative to December. *B12* captures any time trends associated with purchases. These time trends may include changes in population, changes in liquor purchase prices (e.g. liquor purchase inflation), etc. **M1** is a categoric variable valued at 1 for the first month of 2000 and 0 otherwise. Similarly, **M2** and **M3** are categoric variables for the 2nd and 3rd months of 2000. If *B13*, *B14* and/or *B15* are negative and statistically significant, it suggests that the WCB regulation did indeed result in a fall in purchases and, barring inventory changes, a fall in sales and profits. The value of the coefficient (the *B*) indicates the percent change in purchases due to that factor. The variable **NewYear** is valued at 1 for December 1999 and 0 otherwise and is included to capture any over-purchasing that may have occurred in anticipation of the millennium celebrations. **R_Tour** is the level of Accommodation revenue earned in the province (or in each region), deflated by the BC Accommodation price index. It captures changes in visitor arrivals and therefore serves as an indicator of associated economic activity in the province/region.

By using this statistical model, it is possible to assign confidence to our estimates. The key statistic to determine if a coefficient is “significant” (that is, is different from 0) is called the “t-statistic”. This t-stat measures the level of dispersion or variance in the equation. If the variance is small, then we have a lot of confidence that the coefficient is different from 0, if the variance is large, then we have little confidence. The larger the t-stat, the more confidence we have that the coefficient is different from 0 and therefore that there is a true impact. The “significance level” changes from model to model depending on how many variables are used in the equation. In this case, the t-stat must be greater than 1.697 for us to be confident that the coefficient is greater than 0 at a 95% confidence level.²⁰ It should be noted that even if a coefficient is insignificant at the 95% confidence level (an associated t-stat of less than approximately 1.697), it still represents the best, unbiased estimate of the impact.²¹

4.2 ASSUMPTIONS AND CAVEATS OF THE MODEL

Although the present methodology has significant advantages over other techniques, it must be noted that the approach and model has its own shortcomings.

- ◆ Using LDB purchase data to proxy sales may be problematic. Although some alcohol types (e.g., draft beer) are not stocked in large quantities, other alcohol types are. Nevertheless, to reject the results of the model forces one to accept that a major change in inventory patterns took place in January/February 2000 not related to the millennium celebrations. Due to our inability to obtain provincial retail sales tax data in time for this study, we were not able to test whether any statistical evidence is present indicating that inventory patterns changed in either January or February. However, we did examine provincial receipt data, which confirms our

¹⁹ The eight Development Regions are: Vancouver Island/Coast; Mainland/Southwest; Thompson-Okanagan; Kootenay; Cariboo; North Coast; Nechako; Northeast.

²⁰ Throughout this study a two-tailed t-test with a 95% confidence interval was used. However, if one had prior knowledge that the impact of the no-smoking amendment was unambiguously negative (that is, the coefficient has only one possible direction of impact – negative), then a one-tailed t-test would commonly be used with a confidence interval of 90%. In such a case, the required t-statistic at the 90% confidence level is 1.310. Our approach in this study is that the smoking restrictions potentially had both positive and negative repercussions, as witnessed by many facilities increasing their business activity. We therefore rejected the use of one-tailed test and use the 95% confidence interval.

²¹ When a t-stat is not significant it means that the values the coefficient could take includes 0 and therefore there may not be any impact. Nevertheless, if we wish to *predict* the impact, the best (i.e., most likely) estimate would be the value of the coefficient.

findings in this report (see Appendix B3). As such, we are confident that the results presented here reflect accurately the impacts experienced by the various hospitality sub-sectors.

- ◆ The LDB accounting periods do not conform exactly to calendar months and they are not consistent over the years. For example, the accounting period for March 2000 extends from February 27 to March 31 and includes 29 purchasing days (days excluding Sundays and statutory holidays). The accounting period for March 1999, on the other hand, extends from February 28 to March 31, but includes only 27 “shopping days”. Due to the Easter holidays, the accounting period for March 1997 only had 23 purchasing days. In a similar vein, January 2000 had 23 purchasing days, while the January accounting periods for 1999, 1998 and 1997 each had 24 days. In contrast, February in all accounting periods had 24 purchasing days. The statistical effect is that, if nothing else affected purchases and purchasing occurs randomly on all days, we should expect slightly lower purchases in January 2000 and somewhat higher purchases in March 2000. Consequently, the estimated coefficients for January will be biased negatively very slightly (i.e., the negative coefficient will be slightly larger in absolute terms) and the coefficients for March will be biased upward very slightly (see footnote 24).
- ◆ The model does not capture changes in non-liquor activity. Consequently, results for business types with a large food sales component (e.g., dining establishments) need to be treated with some caution in that even if liquor sales fell, food sales may have increased. Nevertheless, an examination of total receipts (food, liquor and other sales) suggests that inclusion of food sales would not alter the substantive results found in this study (see Appendix B3).

5.0 TRENDS IN HOSPITALITY SECTOR ACTIVITY

As explained in Section 4.1, the actual estimation of the impacts of the WCB smoking restrictions on the hospitality sector is done using an econometric model. The model takes into account other factors in addition to time trends and the ETS regulation that could be influencing liquor consumption (e.g., changes in domestic economic activity, changes in tourism activity, etc.). However, before examining the actual impacts, it will be useful for completeness to review the overall trends in liquor purchase activity within the industry over the last number of years.

5.1 TRENDS IN PROVINCIAL LIQUOR PURCHASES BY BUSINESS

Exhibit 1 on the following page displays the trends in purchases of liquor by business (excluding Licence Retail Sales purchases) since October 1996.²²

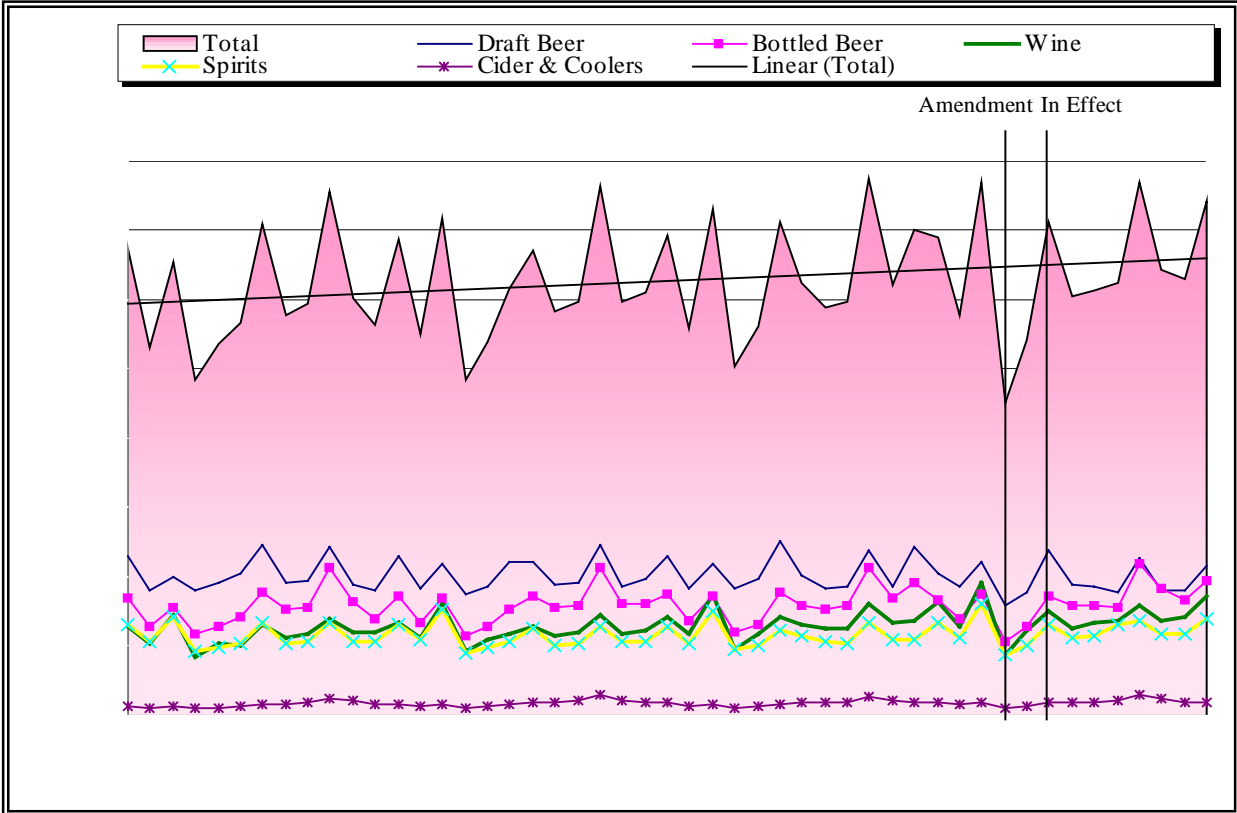
Not surprisingly, the data display a distinct seasonal variation, peaking in July and in December and reaching its lowest point each January. Vertical lines highlight the period when the WCB regulation was in effect. If the regulation were detrimental to purchases, we would expect a marked downturn during that period.

Overall purchases have been trending upward since October 1996 (see “Linear”) in part due to changes in prices, in part due to changes in population growth, and in part due to changes in average consumption. A superficial examination of “Total” purchases, however, suggests a marked decline vis-à-vis January and February in previous years. The value in March 2000, however, reached more-or-less historical levels. One must remember, though, that the amendment was struck down before the end of March and therefore the pattern displayed in that month must be treated with caution.

Within our data we have identified four different business types. Given that each of these has a markedly different reliance on liquor, it might be useful to know how each business type was affected. **Exhibit 2** on the following page displays total purchases for each business type. From the results displayed in the exhibit, it is evident that some business types were affected more dramatically, specifically Hotels/Resorts and Pubs.

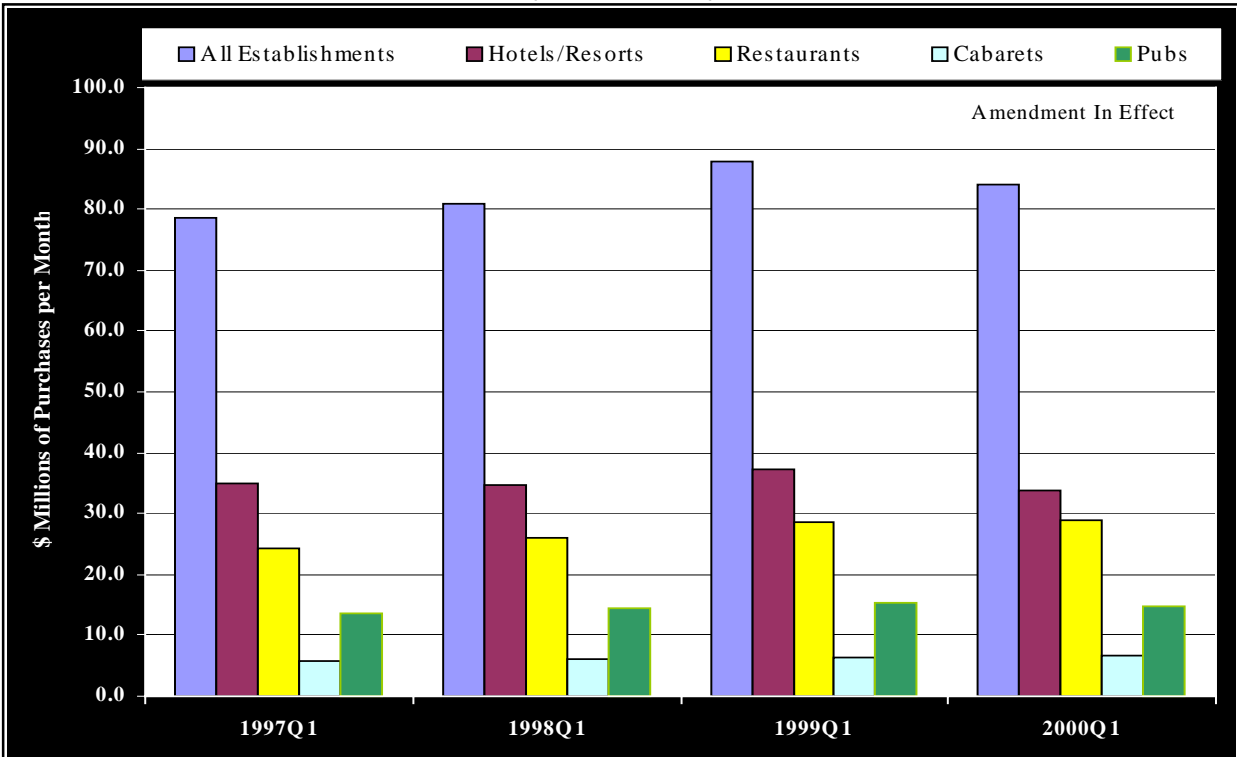
²² All data exclude the Capital Regional District, which instituted smoking restrictions in all restaurants and bars in January 1999.

EXHIBIT 1: Liquor Purchases by Liquor Type, All Businesses



Source: Liquor Distribution Branch

EXHIBIT 2: Total Liquor Purchases by Business Type

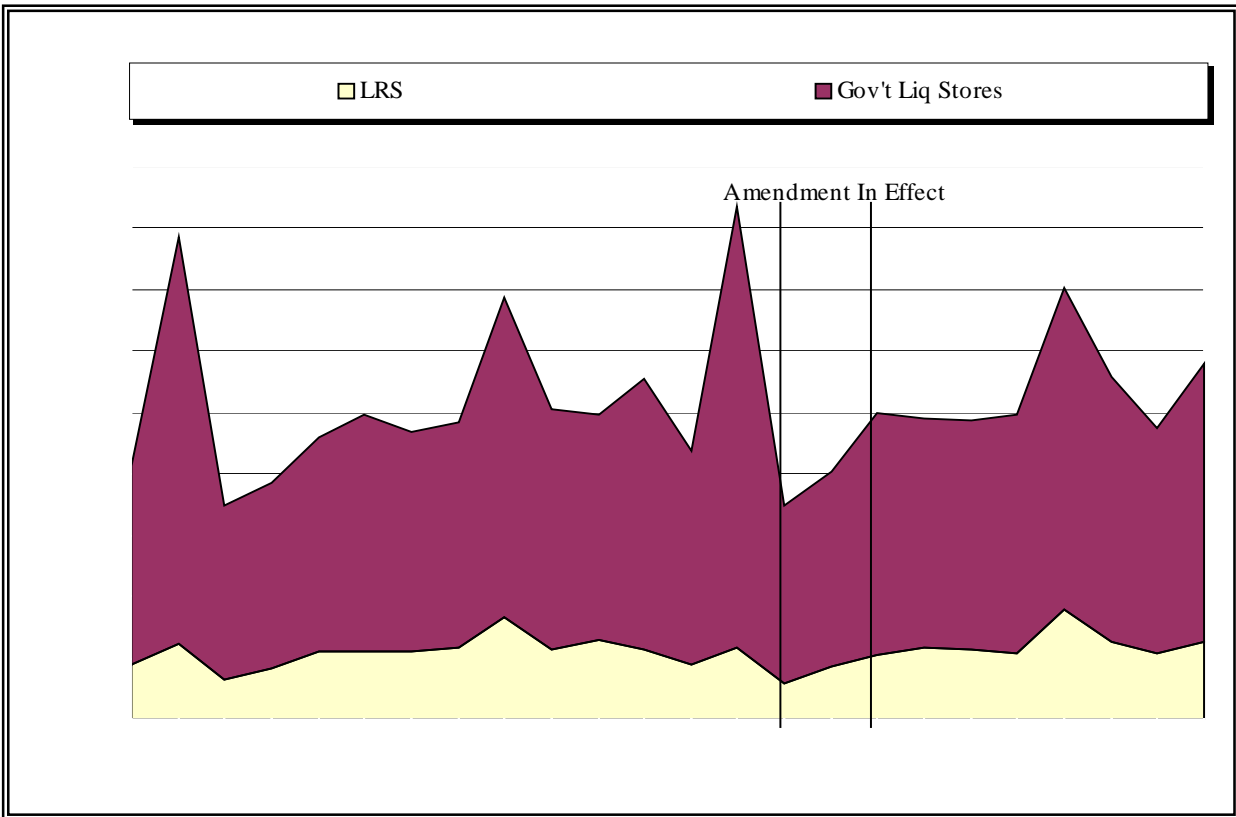


Source: Liquor Distribution Branch

5.2 TRENDS IN LIQUOR PURCHASES BY PERSONS

It is possible that during the period smoking was restricted customers chose to purchase liquor directly from Licencee Retail Stores (LRS) or from Government Liquor Stores (GLS) and consume at home rather than frequent local establishments. **Exhibit 3** below displays the trend in over-the-counter sales to persons from these two sources since November 1998.²³ As shown, total over-the-counter sales from Government Liquor Stores in January 2000 were very slightly higher than sales in January 1999 (approximately a 2 percent increase) and LRS sales actually fell by some 8 percent during that same time period.²⁴ Given that there has been an upward trend in over-the-counter sales over time, it does not appear that there was a notable shift to over-the-counter sales in that month. February Government sales display an increase of just over 5 percent while LRS sales increased by 3 percent. In March, Government sales increased by over 13 percent, but in contrast, LRS sales actually fell by some 5 percent.

EXHIBIT 3: Total Liquor Purchases by Persons



Source: Liquor Distribution Branch

5.3 TRENDS IN UNEMPLOYMENT

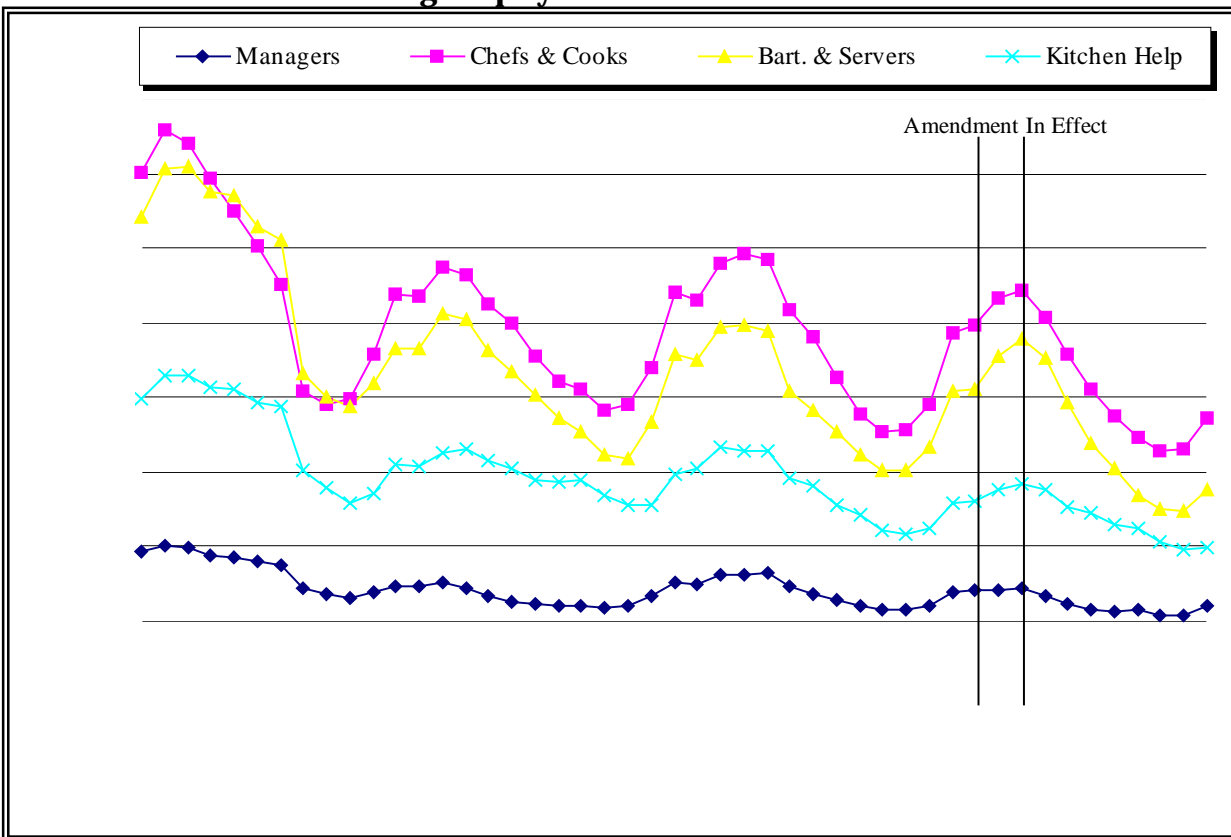
Exhibit 4 on the following page displays the time series of EI recipients since the beginning of 1997 sub-divided by the four occupational categories. On a year-over-year basis, one can see that the first quarter of 2000 witnessed a decline in EI recipients. However, this should not be construed as suggesting that the smoking amendment reduced unemployment since many other factors may have influence hospitality activity (observe the downtrend in recipients in each July/August). More important is to assess the change from December 1999.

²³ Due to a change in computer systems at the Liquor Distribution Branch, Government Liquor Store sales were only available after October 1998.

²⁴ The same accounting period problems as with business sales affect the over-the-counter sales. Since the number of "purchase days" in January 2000 were 23 and in January 1999 were 24, we would expect a slight decline in sales of roughly 4 to 5 percent. The number of "Purchasing days" in February 2000 was the same as in February 1999 while the number in March 2000 was 2 higher (or roughly 7 percent higher).

Although all occupations show an increase in unemployment in the 1st quarter of 2000 (a total difference of 135, March 2000 vs. December 1999), similar increases are observed in the 1st quarters of 1998 (109) and 1999 (149). Hence, it is difficult to claim that there was a marked increase in unemployment in these occupations during the time the smoking restrictions were in effect.

EXHIBIT 4: Persons Receiving Employment Insurance Benefits



Source: Human Resources Development Canada

6.0 PROVINCIAL SHORT-TERM IMPACTS

The graphical results presented above provide some evidence as to the short-term impacts that the WCB regulation may have had on hospitality businesses in BC. However, since other factors may be affecting purchases and sales over time (e.g., the general health of the local economy, tourism activity, etc.), a graphical depiction may not give an unambiguous appraisal of the impacts. Nor do the graphical results enable us to quantify the level of change, if any, that different business types and different regions incurred due to imposition of the smoking restrictions. As discussed in Section 4.1, in order to assess the impacts properly, we designed a statistically defensible econometric model that provides statistically valid results, complete with confidence intervals.

Before discussing the results of the model, however, it should be noted that the WCB non-smoking amendment was in effect for less than three months (January 1 2000 to March 22 2000). It is possible that the behaviour of restaurant, cabaret and pub patrons in the short run could differ from their long-term behaviour. For example, patrons may initially boycott local establishments in protest of the regulation, but after several months return to their previous behaviour. Given the limited duration the regulation was in force, it is not possible to use the provincial liquor database and our proposed model to analyze these longer-term impacts on sales. Instead, this section of the report looks only at the immediate, short-term impacts during the 1st quarter of 2000, leaving the analysis of potential longer-term affects to Section 7.0.

6.1 SHORT-TERM MODEL RESULTS

Exhibit 5A displays the results for the regression equation for Total Liquor purchases for all businesses in the province including the variable “Retail Sales” (R_Sales).²⁵

EXHIBIT 5A: Equation for Total Liquor Purchases, Total Province (with Retail Sales)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.958 ^a	.917	.866	4.8342E-02	2.487

a.

Predictors: (Constant), R_SALES, M3, APR, OCT, SEP, NOV, M2, M1, JUN, AUG, MAY, NEW_YEAR, TIME, JUL, MAR, JAN, LOG_RT, FEE

b. Dependent Variable: LOG_TOT

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.141	5.104		2.379	.024
	JAN	-.324	.091	-.685	-3.577	.001
	FEB	-.223	.112	-.471	-1.979	.057
	MAR	-.128	.093	-.272	-1.383	.177
	APR	-8.47E-02	.066	-.179	-1.293	.206
	MAY	-.206	.058	-.437	-3.527	.001
	JUN	-.191	.065	-.405	-2.934	.006
	JUL	1.960E-02	.081	.042	.243	.809
	AUG	-.216	.093	-.457	-2.330	.027
	SEP	-.166	.072	-.351	-2.307	.028
	OCT	-1.13E-02	.061	-.024	-.187	.853
	NOV	-.199	.066	-.422	-3.011	.005
	TIME	8.226E-04	.001	.087	.937	.357
	M1	-.121	.058	-.132	-2.069	.048
	M2	-5.84E-02	.061	-.064	-.961	.345
	M3	7.209E-02	.061	.079	1.178	.248
	NEW_YEAR	4.938E-02	.060	.054	.829	.414
	LOG_RT	.144	.155	.218	.927	.362
	R_SALES	.170	.288	.120	.591	.559

a. Dependent Variable: LOG_TOT

²⁵ Only those establishments with licensee types A, B, C, D, or F are included. In addition, since the Capital Regional District (CRD) eliminated smoking from hospitality workplaces in January 1999 (a year prior to the WCB amendment), the regression analysis excludes data from establishments within the CRD. In this context, it should be pointed out that after the WCB amendment was struck down, a number of municipalities made changes to their smoking bylaws to strengthen no-smoking regulations. As such, the post-amendment period is not exactly reflective of the pre-amendment period.

Exhibit 5B below displays the results for the same regression equation but this time excluding the variable “Retail Sales.” The summary statistics for each liquor type are contained in **Exhibits 6A** and **6B**.

EXHIBIT 5B: Equation for Total Liquor Purchases, Total Province (without Retail Sales)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.957 ^a	.916	.869	4.7815E-02	2.540

a. Predictors: (Constant), LOG_RT, FEB, M1, MAY, NEW_YEAR, APR, JUN, M3, SEP, OCT, M2, JUL, JAN, TIME, MAR, NOV, AUG

b. Dependent Variable: LOG_TOT

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.683	2.721		5.396	.000
	JAN	-.371	.041	-.786	-9.105	.000
	FEB	-.283	.048	-.599	-5.906	.000
	MAR	-.166	.066	-.352	-2.509	.018
	APR	-.114	.043	-.241	-2.668	.012
	MAY	-.226	.048	-.478	-4.709	.000
	JUN	-.213	.053	-.451	-3.999	.000
	JUL	2.161E-03	.074	.005	.029	.977
	AUG	-.236	.085	-.500	-2.789	.009
	SEP	-.191	.057	-.405	-3.360	.002
	OCT	-3.96E-02	.037	-.084	-1.079	.289
	NOV	-.230	.041	-.487	-5.652	.000
	TIME	9.918E-04	.001	.105	1.208	.237
	M1	-.123	.057	-.135	-2.145	.040
	M2	-4.86E-02	.058	-.053	-.840	.407
	M3	8.192E-02	.058	.090	1.407	.170
	NEW_YEAR	5.841E-02	.057	.064	1.026	.313
	LOG_RT	.144	.153	.220	.942	.354

a. Dependent Variable: LOG_TOT

As stated previously, it was not possible to obtain regional retail sales data in time for inclusion in this study. The importance of estimating two, slightly different models is to provide evidence that the inclusion of Retail Sales as a variable does not add to the explanatory power of the equations and, more important, including Retail Sales does not change in any measurable way the resulting estimated impacts.

The coefficient on R_Sales in **Exhibit 5A** is not significant (t-stat = 0.591) and the explanatory power (R²) is lower than in **Exhibit 5B**. One also notes that the estimated coefficients on **M1** (January 2000) are -12.1 and -12.3 respectively and the estimated t-statistics are -2.069 and -2.145. The same, extremely close association for **M2** and **M3** in the two equations is apparent. Consequently, we can claim that including Retail Sales as a variable does not measurably alter the qualitative impacts and has no statistically significant effect on the actual estimated values. As such, the evidence suggests that excluding regional Retail Sales in the regional equations will not affect the estimated coefficients for the conclusions.

In **Exhibit 6A** and **6B**, the columns **M1**, **M2** and **M3** (respectively, variables for January, February and March 2000) list the estimated value of the coefficients pertaining to the regulation period. The column “t-stat” highlights the estimated t-statistic for each variable and indicates whether that estimated coefficient is significantly different from 0. The importance of the t-statistic is that, although the model constructs a specific “best” estimate for each coefficient, there is a range (or confidence interval) surrounding each coefficient. As a result, unless the t-stat is approximately 1.697, we can not be assured that the estimated coefficient is different from 0 at the 95% confidence level. The column “**R²**” indicates how well the regression fits the data (1.00 is a perfect fit; 0.0 indicates no fit at all).

EXHIBIT 6A: Summary Results by Liquor Type, Province (with Retail Sales)

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
<i>Draft Beer</i>	-0.108	-1.316	-0.054	-0.628	0.076	0.882	0.662
<i>Packaged Beer</i>	-0.132	-1.958	-0.069	-0.978	0.048	0.684	0.884
<i>Wine</i>	-0.144	-2.541	-0.029	-0.481	0.116	1.948	0.921
<i>Spirits</i>	-0.085	-1.425	-0.077	-1.237	0.067	1.071	0.881
<i>Cider & Coolers</i>	-0.167	-2.047	-0.066	-0.769	0.087	1.014	0.934
TOTAL	-0.121	-2.069	-0.058	-0.961	0.072	1.178	0.866

A t-stat of at least 1.699 is required for a coefficient to be statistically significant at the 95% confidence level

EXHIBIT 6B: Summary Results by Liquor Type, Province (without Retail Sales)

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
<i>Draft Beer</i>	-0.105	-1.293	-0.067	-0.818	0.063	0.770	0.670
<i>Packaged Beer</i>	-0.134	-2.022	-0.061	-0.920	0.056	0.832	0.887
<i>Wine</i>	-0.147	-2.623	-0.019	-0.337	0.126	2.215	0.923
<i>Spirits</i>	-0.098	-1.480	-0.028	-0.412	0.116	1.731	0.851
<i>Cider & Coolers</i>	-0.162	-2.002	-0.084	-1.035	0.068	0.829	0.935
TOTAL	-0.123	-2.145	-0.049	-0.840	0.082	1.407	0.869

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

If **M1**, **M2** and/or **M3** are positive, then the regulation increased purchases (sales); if negative, the regulation is associated with decreased purchases. The value of the coefficient indicates the estimated percent change in purchases each month due to the smoking restrictions.

Reviewing the Total impacts first, the high R² indicates that the equation has very good explanatory power, explaining roughly 87 percent of the variation in purchases. The coefficient on **M1** (January) is negative and significant. It indicates that during the month of January (and ignoring inventory changes), the amendment reduced overall purchases by an estimated 12.3 percent.²⁶ With Total Purchases in the province of approximately \$20.4 million in January 2000, the impact on purchases is estimated at roughly \$2.5 million. Given a very rough approximation of mark-ups at 3.25 to 1, the amendment likely reduced overall sales in the neighbourhood of \$8.25 million in the whole of the province. The coefficient for February (**M2**) is insignificant. That is, we can not say with 95% confidence that the regulation impacted liquor purchases or sales in that month. Nevertheless, the coefficient represents the best, unbiased estimate of the change in liquor purchases. With a value of -4.9 percent and total purchases in February at roughly \$24.5 million, this translates to a decline of approximately \$1.25 million in purchases or \$4.0 million in sales. The coefficient for March (**M3**) in contrast is positive (8.2 percent) but it is also not significant. Given the rather large bias that the accounting period may add and the fact that the amendment itself was overturned on March 22, it is difficult to use the coefficient on **M3** to infer a true increase in sales.

²⁶ The LDB accounting period for January 2000 had approximately 3 percent fewer “purchasing days” than average. Hence a portion of this decline may be attributable to this difference. Similarly, the March 2000 accounting period had approximately 10 percent more “purchasing days” which would tend to bias the estimate upward.

Reviewing the individual alcohol types suggests most liquor types were negatively affected during January, although neither Draft Beer nor spirits are significant. Nevertheless, the large point estimate decline in Draft Beer in January (-10.5%) suggests that changes in inventories were not causing the overall fall in purchases. The coefficients on all liquor types in February are insignificant, but again the large point estimate decline in Draft Beer provides evidence for a decline in overall sales. Both Wine and Spirits are positive and significant in March, but one must wonder whether this is a result of the accounting period and/or a build up of inventories.

EXHIBIT 7: Summary Results by Business and Liquor Type, Province

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
Hotels/Resorts							
<i>Draft Beer</i>	-0.112	-1.269	-0.064	-0.724	0.048	0.534	0.669
<i>Packaged Beer</i>	-0.156	-2.064	-0.080	-1.049	0.030	0.396	0.806
<i>Wine</i>	-0.207	-2.196	-0.135	-1.431	0.077	0.808	0.857
<i>Spirits</i>	-0.100	-1.475	-0.049	-0.720	0.112	1.629	0.844
<i>Cider & Coolers</i>	-0.161	-1.895	-0.107	-1.258	0.031	0.362	0.901
TOTAL	-0.137	-1.993	-0.077	-1.110	0.054	0.783	0.787
Dining Establish							
<i>Draft Beer</i>	-0.127	-1.337	-0.057	-0.594	0.113	1.174	0.765
<i>Packaged Beer</i>	-0.104	-1.664	-0.050	-0.799	0.123	1.943	0.937
<i>Wine</i>	-0.130	-2.395	0.013	0.239	0.142	2.583	0.920
<i>Spirits</i>	-0.090	-1.375	-0.017	-0.262	0.112	1.681	0.907
<i>Cider & Coolers</i>	-0.110	-1.439	-0.040	-0.525	0.166	2.153	0.969
TOTAL	-0.119	-2.255	-0.017	-0.313	0.128	2.406	0.927
Cabarets							
<i>Draft Beer</i>	0.073	0.790	0.010	0.108	0.060	0.634	0.740
<i>Packaged Beer</i>	-0.052	-0.709	0.031	0.419	0.106	1.431	0.802
<i>Wine</i>	-0.069	-0.372	0.039	0.211	0.235	1.256	0.808
<i>Spirits</i>	-0.066	-0.768	0.025	0.293	0.148	1.686	0.720
<i>Cider & Coolers</i>	-0.192	-1.576	-0.079	-0.646	0.054	0.433	0.667
TOTAL	-0.048	-0.717	0.016	0.244	0.113	1.670	0.804
Pubs							
<i>Draft Beer</i>	-0.087	-1.152	-0.089	-1.168	0.047	0.611	0.743
<i>Packaged Beer</i>	-0.144	-1.948	-0.070	-0.940	0.024	0.324	0.911
<i>Wine</i>	-0.151	-2.169	-0.021	-0.299	0.100	1.415	0.892
<i>Spirits</i>	-0.136	-2.060	-0.051	-0.762	0.098	1.471	0.866
<i>Cider & Coolers</i>	-0.157	-1.580	-0.059	-0.586	0.077	0.767	0.941
TOTAL	-0.122	-2.059	-0.074	-1.244	0.048	0.805	0.891

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

The trend data displayed in **Exhibit 2** suggested that the various business types under consideration were affected differently by the amendment. In order to test statistically these different impacts, the regression model was run for each business type. **Exhibit 7** on the previous page above highlights these results.

In assessing the four major business types, the following can be inferred:

- **Hotels/Resorts:** The coefficient for January 2000 (**M1**) shows a standardized decline of 13.7% in total purchases which translates into a decline of \$1.25 million in purchases or roughly \$4.1 million in sales (ignoring changes in inventories). The estimate is statistically significant at the 95% confidence level (t-stat = -1.993). While February (**M2**) shows a decline (7.7%) in total purchases and March (**M3**) a slight increase (5.4%) neither is statistically significant.

Packaged Beer, Wine and Ciders & Coolers display negative and significant impacts in January. The coefficient on Draft Beer (-11.2%), although insignificant, does suggest that inventorying is not impacting the results. All liquor types in February and March are not significant.

The estimated R^2 suggests the model “explained” 78.7% of the variation in total Hotel/Resort purchases. This level of explanatory power exceeds all published studies measuring the impacts of non-smoking regulations.²⁷

Conclusion: *The WCB amendment does appear to have had a negative impact on total Hotel/Resort alcohol purchases during January 2000 but not in the months of February and March.*

- **Dining Establishments:** The coefficient for January 2000 (**M1**) shows a standardized decline of 11.9% in total liquor purchases (a decline of \$900,000 in purchases or roughly \$3.0 million in sales), and the coefficient is strongly significant at the 95% confidence level (t-stat = -2.255). February (**M2**) shows a small decline (1.7%) in total purchases but is not significant. March (**M3**), on the other hand, has an estimated increase of 12.8% and is statistically significant. Although the accounting period in March 2000 was greater, the magnitude of the increase suggests a true increase in sales and/or a build up of lost inventory.

Within the various types of liquor, Wine is significantly negative in January. . The coefficient on Draft Beer (-12.7%), however, does suggest that sales did decline and that inventory changes are not the reason for lower purchases. All coefficients are insignificant in February while Packaged Beer, Wine and Ciders & Coolers display positive and significant impacts in March.

The estimated R^2 suggests the model “explained” 92.7% of the variation in total Dining Establishment purchases.

Conclusion: *The WCB amendment appears to have had a negative impact on total Dining Establishment alcohol purchases during January 2000 but not in the month of February. Note that the decline in liquor purchases does not necessarily imply a decline in food sales, the dominant revenue source for Dining Establishments.*

- **Cabarets:** The coefficient for January 2000 (**M1**) shows a standardized decline of 4.8% in total purchases, however even this relatively small decline is not statistically significant at the 95% confidence level (t-stat = -0.717). February (**M2**) shows a small increase (1.6%) in total purchases but is not significant either. March (**M3**), on the other hand, shows a fairly large increase of 11.3%, although it is not quite statistically significant.

No alcohol type displays a significant impact during the three months the amendment was in effect.

The estimated R^2 suggests the model “explained” 80.4% of the variation in total Cabaret purchases.

Conclusion: *The WCB amendment does not appear to have had a negative impact on total Cabaret alcohol purchases in any month.*

²⁷ See, for example, “Assessment of the Impacts of a 100% Smoke –Free Ordinance on Restaurant Sales – West Lake Hills, Texas, 1992 – 1994”.

- **Pubs:** The coefficient for January 2000 (**M1**) shows a standardized decline of 12.2% in total purchases (a decline of \$500,000 in purchases or roughly \$1.5 million in sales) and the value is strongly significant at the 95% confidence level (t-stat = -2.059). While February (**M2**) shows a decline (7.4 %) in total purchases and March (**M3**) a slight increase (4.8%) neither is statistically significant.

Within the various alcohol types, Packaged Beer, Wine and Spirits all display negative and significant impacts in January. All types are insignificantly different from zero in February and in March.

The estimated R^2 suggests the model “explained” 89.1% of the variation in total Neighbourhood and Marine Pub purchases.

Conclusion: *The WCB amendment appears to have had a negative impact on total Neighbourhood and Marine Pub alcohol purchases in January, but the evidence does not confirm any impact in February or March.*

7.0 REGIONAL SHORT-TERM RESULTS

It is possible that the major urban areas (Lower Mainland, Victoria, etc.) may be able to accommodate non-smoking within restaurants and bars, whereas those regions in the interior and north of the province, where more people smoke and the weather is more severe, may not. As a consequence, it is important to assess the short-term impacts on a regional level.

The Liquor Purchase Data is provided by establishment (licensee) complete with Postal Code. Using this information, the data can be aggregated to virtually any geographical level desired. For the purposes of this report, we compile the data and show the results by the eight Development Regions. We also present the results for “Rural” areas (establishments with postal codes VOX X0X) and for those establishments that are located close to the Alberta and/or US borders.²⁸ The regression analysis was also conducted for each of the 28 Regional Districts in the Province, however no discussion of the results is included in this report. The model results for the Regional Districts are contained in the Appendix G.

7.1 SHORT-TERM RESULTS BY DEVELOPMENT REGION

- **Vancouver Island/Coast (less CRD):** Reviewing Total purchases, the coefficient for January 2000 (**M1**) shows a standardized decline of 11.7% in purchases and the value is significant at the 95% confidence level (t-stat = -2.344). February (**M2**) shows a slight (but not significant) decline (4.3%) in total purchases. March (**M3**) shows an increase of 8.7% and the coefficient is (just) significant. The March value, however, includes confounding factors such as the longer accounting period and the cessation of the smoking amendment. Therefore, the value must be treated with some caution.

Within the various alcohol types, all liquor types with the exception of Spirits have significant negative impacts in January. All types of liquor are insignificantly different from zero in February. In contrast, both Wine and Cider & Coolers show statistically significant increases in purchases in March.

The estimated R^2 suggests the model “explained” 93.7% of the variation in total liquor purchases in the Vancouver Island/Coast (less CRD) area.

Conclusion: *The WCB amendment appears to have had a strong, negative impact on total alcohol purchases in Development Region 1 in the short run, particularly in the January period.*

²⁸ The definition of “Border” is any establishment located within a census sub-division that borders either the Alberta or US frontiers.

EXHIBIT 8: Summary Results by Region and Liquor Type

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
Van. Island/Coast							
<i>Draft Beer</i>	-0.116	-1.747	-0.082	-1.237	0.077	1.130	0.822
<i>Packaged Beer</i>	-0.113	-1.767	-0.013	-0.209	0.084	1.287	0.933
<i>Wine</i>	-0.118	-1.764	0.048	0.718	0.131	1.919	0.948
<i>Spirits</i>	-0.087	-1.486	-0.072	-1.234	0.091	1.531	0.921
<i>Cider & Coolers</i>	-0.147	-2.300	-0.006	-0.091	0.125	1.911	0.962
TOTAL	-0.117	-2.344	-0.043	-0.869	0.087	1.701	0.937
Mainland/Southwest							
<i>Draft Beer</i>	-0.099	-1.136	-0.057	-0.645	0.096	1.080	0.621
<i>Packaged Beer</i>	-0.128	-1.881	-0.040	-0.581	0.084	1.222	0.847
<i>Wine</i>	-0.151	-2.748	-0.021	-0.382	0.138	2.475	0.923
<i>Spirits</i>	-0.107	-1.516	-0.002	-0.026	0.136	1.895	0.821
<i>Cider & Coolers</i>	-0.160	-1.741	-0.066	-0.710	0.078	0.838	0.894
TOTAL	-0.124	-2.102	-0.034	-0.582	0.109	1.818	0.850
Thompson-Okanagan							
<i>Draft Beer</i>	-0.108	-1.408	-0.068	-0.901	0.027	0.361	0.747
<i>Packaged Beer</i>	-0.152	-2.070	-0.125	-1.730	0.020	0.276	0.921
<i>Wine</i>	-0.172	-1.732	-0.012	-0.126	0.040	0.405	0.807
<i>Spirits</i>	-0.076	-1.116	-0.071	-1.061	0.081	1.216	0.887
<i>Cider & Coolers</i>	-0.262	-3.339	-0.171	-2.208	0.079	1.023	0.968
TOTAL	-0.131	-2.127	-0.081	-1.333	0.033	0.551	0.894
Kootenay							
<i>Draft Beer</i>	-0.059	-0.659	-0.006	-0.068	-0.012	-0.115	0.617
<i>Packaged Beer</i>	-0.137	-1.569	-0.088	-0.990	-0.026	-0.264	0.871
<i>Wine</i>	-0.066	-0.616	0.004	0.039	0.224	1.826	0.860
<i>Spirits</i>	-0.051	-0.559	-0.056	-0.599	0.106	1.021	0.819
<i>Cider & Coolers</i>	-0.092	-0.835	-0.007	-0.065	0.071	0.567	0.931
TOTAL	-0.089	-1.197	-0.043	-0.564	0.026	0.307	0.835

- Mainland/Southwest:** The coefficient for January 2000 (**M1**) shows a standardized decline of 12.4% in total purchases and that value is significant at the 95% confidence level (t-stat = -2.102). While February (**M2**) shows a small decline (3.4%) in total purchases, it is not significant. March (**M3**) displays a fair increase (10.9%) and is statistically significant. The confounding factors in March, however, require a cautionary acceptance of the estimate.

Within the various alcohol types, Packaged Beer, Wine and Ciders & Coolers all display negative and significant impacts in January. All types are insignificantly different from zero in February while in March Wine and Spirits display significant increases.

The estimated R² suggests the model “explained” 85.0% of the variation in total liquor purchases in the Mainland/Southwest.

Conclusion: The WCB amendment appears to have had a strong, negative impact on total alcohol purchases in Development Region 2 in the short run, particularly in the January period.

- **Thompson-Okanagan:** The coefficient for January 2000 (**M1**) shows a standardized decline of 13.1% in total purchases and that value is significant at the 95% confidence level (t-stat = -2.127). While February (**M2**) shows a decline 8.1% in total purchases and March (**M3**) a small increase (3.3%) neither is statistically significant.

Within the various alcohol types, all except Draft Beer and Spirits display significant negative impacts in January. Packaged Beer and Cider & Coolers are negative and significant in February. However, all types of liquor show statistically insignificant increases in March.

The estimated R^2 suggests the model “explained” 89.4% of the variation in total liquor purchases in the Thompson-Okanagan region.

Conclusion: The WCB amendment appears to have had a strong, negative impact on total alcohol purchases in Development Region 3 in the short run, particularly in the January period.

- **Kootenay:** The coefficient for January 2000 (**M1**) shows a standardized decline of 8.9% in total purchases, however that value is not significant at the 95% confidence level (t-stat = -1.097). While February (**M2**) shows a small decline (4.3%) in total purchases and March (**M3**) a small increase (2.6%) neither is statistically significant.

Within the various alcohol types, all display insignificant impacts in January. Similarly, all types are not significantly different from zero in February. The same holds true for March with the exception of Wine, which shows a statistically significant increase in purchases.

The estimated R^2 suggests the model “explained” 83.5% of the variation in total liquor purchases in the Kootenay region.

Conclusion: The WCB amendment appears not to have had a negative impact on total alcohol purchases in Development Region 4 in the short run.

- **Cariboo:** The coefficient for January 2000 (**M1**) shows a large standardized decline of 15.1% in total purchases and that value is strongly significant at the 95% confidence level (t-stat = -2.500). While February (**M2**) shows a decline (8.9%) in total purchases and March (**M3**) a slight increase (5.4%) neither is statistically significant.

Within the various alcohol types, Packaged Beer and Spirits display negative and significant impacts in January. With the exception of Cider & Coolers in February, all liquor types are not significantly different from zero in February and in March.

The estimated R^2 suggests the model “explained” 88.8% of the variation in total alcohol purchases in the Cariboo.

Conclusion: The WCB amendment appears to have had a strong, negative impact on alcohol purchases in Development Region 5 in the short run.

- **North Coast:** The coefficient for January 2000 (**M1**) shows a large standardized decline of 17.4% in total purchases and that value is strongly significant at the 95% confidence level (t-stat = -2.259). February (**M2**) again shows a large decline (16.1%) in total purchases and is also strongly significant (t-stat = -2.095). In March (**M3**) there was a slight increase (4.8%), however it is statistically not significant.

Within the various alcohol types, only Packaged Beer displays negative and significant impacts in January. Wine in January actually shows an increase, but this value has a very low associated t-statistic. In February, Draft Beer and Wine display negative and significant impacts. All liquor types with the exception of Spirits and Ciders & Coolers are not significantly different from zero in March.

The estimated R^2 suggests the model “explained” 90.9% of the variation in total liquor purchases in the North Coast.

Conclusion: The WCB amendment appears to have had a strong, negative impact on total alcohol purchases in Development Region 6 in both January and February.

EXHIBIT 9: Summary Results by Region and Liquor Type (continued)

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
Cariboo							
<i>Draft Beer</i>	-0.135	-1.527	-0.122	-1.397	-0.042	-0.447	0.719
<i>Packaged Beer</i>	-0.184	-2.847	-0.092	-1.447	0.077	1.138	0.892
<i>Wine</i>	0.027	0.233	0.034	0.299	0.143	1.165	0.798
<i>Spirits</i>	-0.170	-2.464	-0.074	-1.090	0.121	1.671	0.912
<i>Cider & Coolers</i>	-0.147	-1.487	-0.208	-2.130	0.027	0.257	0.909
TOTAL	-0.151	-2.500	-0.089	-1.486	0.054	0.852	0.888
North Coast							
<i>Draft Beer</i>	-0.122	-1.693	-0.163	-2.258	-0.052	-0.720	0.881
<i>Packaged Beer</i>	-0.228	-2.459	-0.145	-1.568	0.034	0.371	0.883
<i>Wine</i>	0.018	0.095	-0.337	-1.821	0.088	0.476	0.862
<i>Spirits</i>	-0.143	-1.377	-0.126	-1.210	0.184	1.765	0.823
<i>Cider & Coolers</i>	-0.159	-1.427	-0.094	-0.838	0.223	1.990	0.881
TOTAL	-0.174	-2.259	-0.161	-2.095	0.048	0.625	0.909
Nechako							
<i>Draft Beer</i>	-0.224	-1.935	-0.066	-0.578	-0.014	-0.120	0.597
<i>Packaged Beer</i>	-0.223	-1.797	-0.115	-0.944	-0.054	-0.436	0.738
<i>Wine</i>	-0.543	-5.090	-0.053	-0.506	0.139	1.298	0.905
<i>Spirits</i>	-0.097	-1.277	-0.112	-1.488	0.112	1.461	0.906
<i>Cider & Coolers</i>	-0.151	-1.072	-0.262	-1.892	-0.173	-1.225	0.900
TOTAL	-0.211	-2.283	-0.107	-1.176	-0.007	-0.078	0.806
Northeast							
<i>Draft Beer</i>	-0.078	-0.838	-0.192	-2.019	-0.175	-1.888	0.675
<i>Packaged Beer</i>	-0.108	-1.214	-0.167	-1.835	-0.003	-0.038	0.722
<i>Wine</i>	-0.197	-1.602	-0.113	-0.901	-0.044	-0.356	0.775
<i>Spirits</i>	-0.179	-2.202	-0.216	-2.295	0.028	0.343	0.833
<i>Cider & Coolers</i>	-0.114	-0.602	-0.219	-1.130	0.081	0.431	0.767
TOTAL	-0.129	-1.901	-0.186	-2.671	-0.019	-0.276	0.812

A t-stat of 1.697 is required for a coefficient to be significant at the 95 % confidence level.

- Nechako:** The coefficient for January 2000 (**M1**) shows a large standardized decline of 21.1% in total purchases and that value is highly significant at the 95% confidence level (t-stat = -2.283). While February (**M2**) shows a major decline (10.7%) in total purchases and March (**M3**) a very small decrease (0.7%) neither is statistically significant.

Within the various alcohol types, Draft Beer, Packaged Beer and Wine all display very large negative and significant impacts in January. All liquor types except Cider & Coolers in February are not significantly different from zero in February. In March, all liquor types are not significant.

The estimated R^2 suggests the model “explained” 82.7% of the variation in total liquor purchases in Nechako.

Conclusion: The WCB amendment appears to have had a strong, negative impact on total alcohol purchases, particularly in January in Development Region 7.

- **Northeast:** The coefficient for January 2000 (**M1**) shows a standardized decline of 12.9% in total purchases and the value is significant at the 95% confidence level (t-stat = -1.901). Surprisingly, February (**M2**) shows a larger decline (18.6%) in total purchases and is very strongly significant (t-stat = -2.671). March (**M3**) has a small decline (1.9%), but it is not statistically significant.

Within the various alcohol types, Spirits in January and Draft Beer, Packaged Beer and Spirits in February and Draft Beer in March display negative and significant impacts.

The estimated R^2 suggests the model “explained” 81.2% of the variation in total liquor purchases in the Northeast.

Conclusion: The WCB amendment appears to have had a strong, negative impact on total alcohol purchases in Development Region 8 in both January and February.

7.2 RURAL REGIONS

One question that arises is whether rural areas experienced disproportionate impacts. A separate database of those establishments satisfying the rural conditions was constructed and the analysis re-done.²⁹ **Exhibit 10** displays the impacts for rural regions in the province.

EXHIBIT 10: Total Liquor Purchases by Liquor Type, Rural Regions

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R^2
<i>Draft Beer</i>	-0.042	-0.429	-0.009	-0.089	0.085	0.861	0.673
<i>Packaged Beer</i>	-0.094	-1.220	-0.068	-0.875	0.050	0.640	0.894
<i>Wine</i>	-0.083	-0.975	0.048	0.056	0.146	1.697	0.914
<i>Spirits</i>	0.062	0.911	0.037	0.545	0.169	2.449	0.872
<i>Cider & Coolers</i>	-0.089	-1.234	-0.026	-0.355	0.051	0.703	0.966
TOTAL	-0.047	-0.723	-0.013	-0.194	0.099	1.520	0.880

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

Reviewing Total impacts, the analysis suggests that, unlike for the province as a whole, the January impacts are not significant and the estimated coefficient is much lower in magnitude (4.7 percent vs. 12.3 percent).³⁰ Both February and March Total impacts also are not significant. All liquor types in all months with the exception of Spirits in March also are not significant. The R^2 value is high (88.0 percent) giving confidence to our estimates. Overall, the results indicate that establishments in the rural areas of BC were not measurably impacted in a negative way by the introduction of smoking restrictions.

7.3 BORDER REGIONS

Border areas may have been affected to a greater degree because patrons living near a BC border had greater choice to frequent bars in localities where smoking was permitted. **Exhibit 11** highlights summary statistics for establishments located near the border.³¹ Here the results are quite different from the results for Rural establishments. The January (**M1**) coefficient is highly significant and the value is slightly higher in magnitude than for the province as a whole (-14.2 percent vs. -12.3 percent). However, did border establishments suffer disproportionately compared to the province as a whole? To determine whether the Border Region coefficient is statistically lower (a larger negative impact) than the coefficient for the province we applied a standard difference of means test to the two coefficients. The result suggests that January sales in Border Regions were not impacted more than in the province as a whole. The coefficients for February and March are not significant and show no statistical difference to the provincial results.

²⁹ The definition of “Rural” is any establishment with a V0X X0X postal code format

³⁰ One should recall that the differences in LDB January accounting periods would, if purchases were randomly distributed across all purchasing days, result in an estimated decline of roughly 3%.

³¹ The definition of “Border” is any establishment located within a census sub-division that borders a BC frontier.

EXHIBIT 11: Total Liquor Purchases by Liquor Type, Border Regions

Liquor Type	M1	t-stat	M2	t-stat	M3	t-stat	R ²
<i>Draft Beer</i>	-0.112	-1.182	-0.084	-0.876	0.086	0.892	0.602
<i>Packaged Beer</i>	-0.143	-1.825	-0.076	-0.958	0.096	1.205	0.822
<i>Wine</i>	-0.155	-1.773	0.108	1.224	0.149	1.681	0.777
<i>Spirits</i>	-0.166	-1.946	-0.097	-1.126	0.080	0.927	0.750
<i>Cider & Coolers</i>	-0.186	-1.344	-0.073	-0.526	0.100	0.717	0.876
TOTAL	-0.142	-2.090	-0.051	-0.748	0.095	1.382	0.796

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

8.0 LONG-TERM IMPACTS

The foregoing examined the impacts on the hospitality industry during the relatively short period between January 1 2000 and March 22 2000. The question immediately arises: would these same impacts occur if the regulation remained in place in the longer term? More specifically, are the lost sales (clientele) lost forever, or will disgruntled patrons return to the bars and restaurants after a few months knowing the regulation is permanent.

Since the WCB regulation was only in force for less than three months, it is not possible to use the liquor purchase data for the province to estimate longer-term impacts. However, one jurisdiction, the Capital Regional District (CRD) instituted a somewhat similar no-smoking ordinance beginning in January 1999, and it still remains in effect today.³² It is recognized that the Victoria area may be different in climate and demographics from some other areas of the province. Nevertheless, it may still be possible to use data from the CRD to help determine whether the long-term impacts of instituting smoking restrictions are generally worse or better than the short-term impacts.³³

The OLS regression methodology used to assess the long-term impacts is similar in structure to the one used to assess the provincial short-term impacts, with three exceptions. In particular, the three variables **M1**, **M2** and **M3** are replaced by the following:

- ◆ One, we include the variable **DA_VINCI**, a categoric variable coded 1 if the period lies between November 1999 and February 2000 and 0 otherwise. This variable is designed to capture the impact of the large increase in visitors to Victoria to view the Royal Museum's Leonardo da Vinci exhibit.³⁴ Unfortunately, the Da Vinci exhibit coincided with the beginning of the CRD no-smoking bylaw. Consequently, the coefficient on **DA_VINCI** is a net effect, capturing both the (expected) negative impact of the bylaw and the positive impact of additional visitors to Victoria.
- ◆ Two, the categoric variable **Q2_1999** is included, coded 1 if the period lies within the 2nd quarter of 1999 and 0 otherwise. This variable is a proxy for the short-term impacts of the CRD bylaw since, as mentioned, the Leonardo exhibit affected the 1st quarter results.
- ◆ The third difference is the inclusion on the variable **BYLAW**. This variable is a proxy for the longer-term impacts on the CRD bylaw and is coded 1 if the period lies after the 2nd quarter of 1999 and 0 otherwise. If the coefficient on **BYLAW** is positive (and significant), it indicates

³² The CRD bylaw is different from the WCB proposed amendment in that it is a complete ban on smoking within hospitality premises. The WCB proposed amendment, on the other hand, does allow smoking in specific smoking rooms where workers are not permitted to enter. Since it is expected that a number of establishments will build designated smoking areas should the WCB regulations be adopted, we would expect the CRD results to overstate the negative impact that the WCB regulation may generate.

³³ The CRD bylaw was in effect for only 20 months (October 1996 to August 2000). Consequently, our definition of "long term" is approximately that duration. Our assumption is that this length of time has enabled firms to adjust to the bylaw effects.

³⁴ The Leonardo exhibit was a major exhibition of Leonardo's work staged by the Royal Museum in Victoria. It was recognized for making a huge impact on the number of visitors to Victoria during the period it was on display. The increase in visitation is partly captured in the Accommodation revenue data. However, a disproportionate number of visitors at this time were day-trippers and/or visitors staying with family and friends. These visitors are not captured in the Accommodation statistics.

that in the longer-term the no-smoking bylaw has had a positive impact on liquor purchases. In contrast, if the coefficient is negative (and significant), then the no-smoking bylaw asserts a negative influence on business. If the value of the negative coefficient is less (in absolute terms) than the coefficient on Q2_1999, then some clientele have returned, but not back to pre-bylaw levels. If, however, the coefficient is greater (in absolute terms) then the negative influence of the bylaw is greater in the long-term than in the short term.

The model was simulated using data only for establishments located within the CRD for the period October 1996 to August 2000.

EXHIBIT 12: Regression Equation - Total Liquor Purchases, Capital Regional District

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.969 ^a	.939	.905	4.6958E-02	2.717

a. Predictors: (Constant), LOG_RT, APR, MAR, OCT, NEW_YEAR, MAY, DA_VINCI, JUN, FEB, BYLAW, SEP, Q2_1999, NOV, JUL, JAN, TIME, AUG

b. Dependent Variable: LOG_TOT

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.573	2.605		3.674	.001
	JAN	-.371	.036	-.681	-10.247	.000
	FEB	-.337	.059	-.619	-5.681	.000
	MAR	-.243	.102	-.446	-2.377	.024
	APR	-.218	.122	-.401	-1.785	.084
	MAY	-.336	.153	-.616	-2.195	.036
	JUN	-.358	.168	-.657	-2.128	.042
	JUL	-.203	.206	-.372	-.983	.334
	AUG	-.427	.225	-.784	-1.895	.068
	SEP	-.351	.179	-.644	-1.958	.060
	OCT	-.108	.105	-.198	-1.029	.312
	NOV	-.246	.054	-.451	-4.523	.000
	TIME	-2.03E-04	.001	-.019	-.136	.893
	DA_VINCI	-3.19E-02	.054	-.051	-.590	.559
	Q2_1999	-6.41E-02	.037	-.103	-1.737	.093
	BYLAW	-1.14E-02	.038	-.035	-.299	.767
	NEW_YEAR	4.171E-02	.062	.040	.671	.507
	LOG_RT	.352	.173	.977	2.037	.051

a. Dependent Variable: LOG_TOT

Exhibit 12 on the previous page displays the regression statistics for Total Purchases in the CRD. The R^2 is very high (90.5 percent), indicating a very good fit to the data. The coefficient on **LOG_RT** (real Accommodation revenues) is, not surprisingly, strongly positive and significant, suggesting that tourism has a direct, positive impact on restaurant and bar activity in the CRD.³⁵ The coefficient on **NEW_YEAR** is insignificant (although positive), suggesting that there was no unusual build up of inventories in December 1999 in preparation for the millennium celebrations.

The coefficient on **DA_VINCI** is negative but insignificant, indicating that the combined effects of the bylaw and the Leonardo exhibit were neutral. The coefficient on **Q2_1999** is also negative (-6.4 percent) but it is also significant. This suggests that 2nd quarter purchases were roughly 6.4 percent lower than what would be predicted if the bylaw had not been in place. The conclusion is that there does appear to be short-term impacts on liquor purchases due to the bylaw. The coefficient on **BYLAW**, although very slightly negative (-1.1 percent), is not significant. This implies that the long-term impacts are neutral. Hence, one can conclude that within the CRD there are no long-term impacts associated with the no-smoking bylaw.³⁶

Exhibit 13 displays the summary results, sub-divided by liquor type. While the total impacts of the Da Vinci exhibit combined with the bylaw are neutral, the coefficient on Cider & Coolers is strongly negative and significant. The short-term total impacts are negative and significant. Within the various liquor types, Spirits and Cider and Coolers are negative and significant while Package Beer is very close to being significant. The long-term impacts, however, are neutral for all types of liquor. Hence, the statistical results strongly confirm that there are no long-term impacts from restrictive smoking regulations.

EXHIBIT 13: Summary Statistics by Liquor Type, CRD

Liquor Type	Da_Vinci	t-stat	Q2_1999	t-stat	BYLAW	t-stat	R ²
<i>Draft Beer</i>	-0.032	-0.463	-0.048	-1.014	-0.025	-0.510	0.744
<i>Packaged Beer</i>	-0.080	-1.210	-0.077	-1.693	0.001	0.027	0.889
<i>Wine</i>	-0.009	-0.132	-0.049	-1.048	0.014	0.293	0.933
<i>Spirits</i>	0.015	0.220	-0.095	-2.042	-0.044	-0.916	0.870
<i>Cider & Coolers</i>	-0.153	-2.274	-0.135	-2.934	-0.061	-1.286	0.951
TOTAL	-0.032	-0.590	-0.064	-1.737	-0.011	-0.299	0.905

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

The Capital Regional District is unlike many regions of the province in that the central area (the city of Victoria) is highly dependent on tourism, while the non-core areas are less so. In order to test the hypothesis that areas outside the core Victoria region have experienced different short and long-term impacts, the identical analysis was conducted using only establishments in the CRD located outside of Victoria proper. **Exhibit 14** on the following page displays those results.

In reviewing Total purchases, the short-term impacts (**Q2_1999**) are significant and the point estimate is slightly greater (in absolute terms) than in the CRD as a whole (a decline of 7.5 percent vs. 6.4 percent in the CRD). As in the CRD as a whole, the long-term impacts in the non-core region are neutral. In terms of liquor types, however, there are some differences. In particular, Draft Beer in the short-term (**Q2_1999**) shows a (significant) decline of 8.0 percent (almost twice the CRD as a whole). The overall conclusion is that establishments in the CRD outside Victoria did suffer greater short-term negative impacts than establishments in the Victoria area.

³⁵ The coefficient suggests that a 1 percent increase in visitors increases hospitality purchases (and thus sales) by 0.352 percent.

³⁶ We remind the reader that the CRD bylaw is more restrictive than the WCB proposed amendment in that the WCB regulations will allow establishments to have designated smoking rooms as long as workers do not enter the area. Thus, we would expect that the long-term impacts associated with the WCB amendment would be less than the impacts associated with the CRD bylaw.

EXHIBIT 14: Summary Statistics by Liquor Type, CRD less Victoria

Liquor Type	Da Vinci	t-stat	Q2_1999	t-stat	BYLAW	t-stat	R ²
<i>Draft Beer</i>	-0.045	-0.807	-0.080	-2.107	-0.064	-1.628	0.864
<i>Packaged Beer</i>	-0.077	-1.244	-0.067	-1.574	-0.021	-0.478	0.933
<i>Wine</i>	-0.065	-0.645	-0.052	-0.753	-0.005	-0.071	0.876
<i>Spirits</i>	0.003	-0.041	-0.130	-2.260	-0.097	-1.640	0.865
<i>Cider & Coolers</i>	-0.123	-1.904	-0.094	-2.126	-0.060	-1.312	0.974
TOTAL	-0.055	-0.925	-0.075	-1.845	-0.041	-0.978	0.914

A t-stat of at least 1.697 is required for a coefficient to be statistically significant at the 95% confidence level

The estimated long-term impacts on establishments outside the city proper show somewhat the same pattern as in the CRD as a whole: an insignificant decline of 4.1 percent. Within the liquor types, though, Draft Beer, Spirits and Cider & Coolers are almost significant. Although strictly speaking the statistical analysis must conclude that the long-term impacts are not significantly different from zero for any liquor type, it must be acknowledged that the results for those particular liquor types are borderline significant.³⁷

9.0 VENTILATION

One suggestion for a possible solution to ETS exposure is the installation of ventilation systems. However, a review of the published health literature implies that health impacts are still substantial even under ventilated conditions. In particular, Health Canada states that there is “no known safe level of exposure to carcinogens” of which ETS is one.³⁸

What the WCB proposed regulations do allow is the presence of designated smoking rooms as long as staff are not permitted to enter those premises. It is difficult to assess the costs for constructing such a designated room, since the hospitality industry premises are so varied. Nevertheless, some average cost estimates have been developed that meet the WCB specifications and that meet the required airflow.

The cost of installing proper ventilation is between \$1,400 and \$4,000 with an average cost of around \$2,200, plus another \$800 for renovations. If, however, a new room were required, the costs of construction would be approximately \$16,000. Overall, then, the cost to an establishment would be in the range of between \$3,000 and \$16,000, with the average estimated to be \$10,000.

From a business perspective, an owner will have to look at the cost of installing a designated smoking room against the discounted present value of the expected increase in sales. While it is likely that many establishments will not find it cost effective to provide designated smoking rooms, the additional cost does not seem to be prohibitive given the average level of sales. In those areas of the province where there is a great demand for smoking or in those specific establishments catering to smokers, this alternative would seem a likely investment. As such, the expectations are that the impacts from the proposed amendment would be even less than suggested in this report.

³⁷ This should not be construed as suggesting that the overall long-term impacts are borderline significant. What it does suggest, though, is that some establishments that have relatively high Draft Beer and/or Spirits turnover may have experienced negative long-term impacts. On the other hand, establishments that provided outside smoking areas and/or were able to attract increased no-smoker traffic may have experienced long-term positive impacts.

³⁸ Health Canada, Smoking an Air Quality Fact Sheet, online publication at www.hc-sc.gc.ca

10.0 POTENTIAL BUSINESS BENEFITS

Although the focus of this study has been the estimation of business costs through the loss of liquor sales, it is also true that businesses that adopt no-smoking policies have lower operating costs. These costs, especially related to hospitality businesses, are not well-documented, and no primary research on this aspect has been undertaken for this report. Nevertheless, it is possible to provide some information on the general cost savings that a business could expect to reap.

Cost savings to businesses can be categorized in two ways. The first is savings through less employee absenteeism.³⁹ The second is a savings in operational costs in the form of lower cleaning costs, reduced replacement costs due to fewer burned materials, reduced fire insurance costs, etc.

Several studies have looked at the general impacts of absenteeism in workplaces. Of course, the working conditions in restaurants and bars in BC will differ. Nevertheless, the results of the studies indicate substantive savings from restricting smoking. In Scotland, Parrott et al. estimate that employers losses reached more than £33 (~\$75) million during 1995.⁴⁰ In the US, Dow Chemical Co. estimated that one of its divisions lost roughly \$600,000 annually due to smoker absenteeism, but the research does not identify the potential average savings per worker if no-smoking regulations were instituted.⁴¹ The US Environmental Protection Agency found that smokers have about 50% more workdays lost as compared to non-smokers, but did not state what savings could be realized if smoking were restricted.⁴² Other studies have identified productivity losses due to psychological factors. Gibson, for example, found that “non-smokers hold negative stereotypes of smokers, suffer from depressed mood states when near a smoker, perform worse when around smokers, are more aggressive toward smokers, help smokers less than non-smokers, and require more interpersonal distance when interacting with smokers.”⁴³

The Tobacco Industry and others dispute these savings.⁴⁴ Nevertheless, the fact that many employers are instituting voluntarily restrictions to smoking may lead one to conclude that higher costs are associated with smoking employees and company moral (productivity) is increased.

Savings due to lower maintenance and insurance costs are harder to estimate, particularly given the wide variety of workplaces throughout the economy. Parrott et al.⁴⁵ estimate that Scotland incurs approximately £4 (~\$9) million in additional costs due to workplace fires caused by smokers. The City of Vancouver argues that waiting time will be reduced and that maintenance costs will decrease, but it does not attempt to quantify the findings.⁴⁶ Overall, the Congressional Office of Technology Assessment estimated that smokers in the US cost their employers between US\$2,000 and US\$5,000 per annum in increased health care and fire insurance premiums, absenteeism, lost productivity and property damage.⁴⁷ In addition, it should be recognized that in a restricted smoking area the heating and ventilation costs will be lower. Given the recent increase in natural gas costs, these savings may be substantial.

³⁹ The US-based literature also identifies considerable savings on health costs, but since in BC employers generally do not pay additional health premiums, with the possible exception of extended health care, for smoking employees, most of these savings would not be realized by businesses located in BC.

⁴⁰ Parrott, S., Godfrey, C. & Raw, M. “Cost And Benefit Analysis Of Smoking Cessation In The Workplace”. *Report for the Health Education Board for Scotland. Centre for Health Economics*, University of York, 1996

⁴¹ Sculco, TW. “Smokers’ Rights Legislation: Should the State ‘Butt Out’ of the Workplace”, *Boston College Law Review* 33:879-902 1992

⁴² US Environmental Protection Agency. “The Costs and Benefits of Smoking Restrictions: An Assessment of the Smoke-Free Environment Act of 1993”. Office of Radiation and Indoor Air, Washington, DC. April 1994

⁴³ Gibson, B. “Psychological Aspects of Smoker-Non smoker Interaction: Implications for Public Policy”. *American Psychology*, 49:1081-5, 1994

⁴⁴ See, for example, Slade, J. “Protection from Job Bias for People Who Smoke”. *Journal of Substance Abuse Treatment*, 10:22-31, 1993; or Vaughn, DH. “Smoking in the Workplace: A Management Perspective”. *Employee Relations Law Journal*, 18:123-39, 1992

⁴⁵ Op. Cit.

⁴⁶ City of Vancouver. Policy Report from Medical Officer of Health, “100% Smoke-Free Indoor Environments”, October, 1994.

⁴⁷ Warner D. “We Do Not Hire Smokers: May Employers Discriminate Against Smokers?”, *Employee Responsibilities Rights Journal*, 7:129-40, 1994

Although it was not possible to provide in this study an accurate assessment of the benefits to businesses, the conclusion of the published work overwhelmingly is that businesses benefit both from better worker relations and lower operational costs when smoking is restricted. Of course, these benefits will vary according to the type of business and the location. Businesses where the vast majority of staff are smokers may suffer some temporary worker relation difficulties. On the other hand, the productivity and operational benefits accruing to Lower Mainland restaurants, where both clientele and staff smoking is relatively low may be low. In cabarets and bars, especially outside the metro areas where smoking is generally more prevalent, the benefits may be higher.

11.0 IMPACTS ON BC COMPETITIVENESS

The analysis thus far has suggested that there were statistically significant short-term impacts in many regions of the province but that no evidence of negative long-term impacts is found. Besides any effects on sales, some may question whether the proposed amendment would have any direct effects on BC competitiveness. From an establishment-level perspective, some businesses will be more competitive (the ones which are able to attract sufficient no-smoking clientele or who install designated smoking rooms) while others will become less competitive. However, from a strictly economic perspective, the money *not* spent in restaurants and bars will be spent elsewhere. As a consequence, the impact on the province generally will be neutral.

There are, however, two exceptions to this conclusion. The first is that smoking restrictions may cause BC residents to cross into other jurisdictions (Alberta and/or US) to frequent restaurants and bars in those locations. Second, the proposed amendment may reduce the number of international tourists visiting BC. In either case, BC's competitiveness can be affected. So the question becomes, would the proposed amendment increase BC residents' likelihood of travelling outside the province to drink and/or would the proposed amendment decrease visits to BC?

The first question we have already broached. In Section 7.3, we estimated the impacts on regions in BC close to the Alberta or US borders. The results clearly indicate that there was no statistical difference in overall impacts as compared to the province as a whole. Consequently, we can say with confidence that being close to a border did not result in greater loss of business. Thus, although some establishments may have experienced loss in clientele, the general conclusion is that the proposed amendment will not impact on BC's competitiveness in terms of customers frequenting out-of-province restaurants and bars.

What about the possible impacts on tourism? Given the very short time span the amendment was in effect, using the Accommodation statistics to measure whether tourism changed due to the smoking restrictions is difficult, if only because many other factors may have influenced visitations in those months. For example, there may have been a severe cold spell; alternatively, economic or weather conditions in say, the US may have reduced visits. Thus we are again forced to use the experience of the Capital Regional District to help understand whether tourism could be affected.

In order to test the hypothesis that smoke-free bylaws reduce tourism activity, we use a regression methodology first proposed by Glantz.⁴⁸ This methodology compares the ratio of real accommodation revenues in the CRD to real accommodation revenues in the rest of BC. The hypothesis is that if the no-smoking bylaw negatively influenced tourism activity, then real dollar accommodation revenues in the CRD should become relatively smaller. Thus, the coefficient on the BYLAW variable ought to be negative and significant.

⁴⁸ Glantz SA, Charlesworth A. "Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances" *Journal of the American Medical Association* 281:1911-1918, 1999

EXHIBIT 15 Regression Equation for Tourism Impacts

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.975 ^a	.951	.926	4.6580E-03	1.137

a. Predictors: (Constant), NEW_YEAR, Q2_1999, NOV, OCT, SEP, AUG, JUL, DA_VINCI, MAR, APR, FEB, MAY, JAN, JUN, TIME,

b. Dependent Variable: RT_RATIO

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.851	.003		276.668	.000
	JAN	-5.55E-03	.004	-.090	-1.550	.131
	FEB	4.586E-03	.004	.075	1.280	.210
	MAR	8.463E-03	.004	.138	2.359	.025
	APR	2.726E-02	.004	.444	7.401	.000
	MAY	3.470E-02	.004	.565	9.405	.000
	JUN	3.732E-02	.004	.608	10.077	.000
	JUL	4.067E-02	.004	.663	11.150	.000
	AUG	4.307E-02	.004	.702	11.812	.000
	SEP	3.881E-02	.004	.632	10.631	.000
	OCT	2.682E-02	.004	.437	7.462	.000
	NOV	1.420E-02	.004	.231	3.959	.000
	TIME	3.418E-04	.000	.279	3.432	.002
	DA_VINCI	-5.78E-04	.000	-.190	-1.891	.068
	Q2_1999	-2.07E-03	.004	-.030	-.588	.561
	BYLAW	-5.71E-03	.004	-.156	-1.478	.149
	NEW_YEAR	3.231E-03	.006	.027	.573	.571

a. Dependent Variable: RT_RATIO

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.8469474	.9020598	.8781285	.672347E-02	48
Residual	-8.5E-03	8.76E-03	-2.3E-16	3.782969E-03	48
Std. Predicted Value	-1.865	1.431	.000	1.000	48
Std. Residual	-1.828	1.881	.000	.812	48

a. Dependent Variable: RT_RATIO

Exhibit 15 displays the regression equation for tourism. The coefficient on **Q2_1999** (-0.2%) is almost nil and the t-statistic of -0.588 indicates that the smoking bylaw did not impact tourism activity in the short run. The coefficient on **BYLAW** is also small (-0.6%) and again the t-statistic (t-stat = -1.478) is not significant. This result confirms that long-run tourism activity in the CRD was not negatively affected by the introduction of the no-smoking bylaw.⁴⁹ In conclusion, then, the statistics suggest that the introduction of the proposed amendment will cause neither a substantive dislocation of BC residents to drink and dine in Alberta and US facilities nor will there be an impact on tourist visits to BC.

12.0 CONCLUSION

The over-riding conclusion of this study is that the introduction of the proposed WCB amendment would likely have some negative short-term impacts (i.e., negative impacts for the first few months). However, in the longer term, no measurable impact on either employment or sales would be likely.

Some regions in the province would certainly be affected to a greater degree. Nevertheless, the same conclusions are apparent: some short-term impacts but generally no longer-term effects. Of course, some establishments would suffer disproportionate impacts in the short term. However, they would have the opportunity to construct (at reasonable cost) designated smoking rooms which ought to alleviate much of those impacts.

⁴⁹ The (very small) negative and significant coefficient on *Da_Vinci* does not imply that the *Da Vinci* exhibit reduced tourism in the CRD. It does imply, though, that the *relative* share of real dollar accommodation revenues did fall. This is likely the result of many tourists staying in Vancouver taking day trips over to the Island.

APPENDIX A

**SUMMARY
OF
LITERATURE**

ECONOMIC IMPACT LITERATURE SUMMARY

1. **Tourism and Hotel Revenues Before and After Passage of Smoke-Free restaurant Ordinances;** Glantz SA, Charlesworth A. *Journal of the American Medical Association* 281: 1911-1918, 1999.

Abstract:

The objective of the study is to determine if no-smoking ordinances impact negatively on hotel revenues and international tourism. The study examines hotel room revenues and hotel revenues as a fraction of total retail sales comparing pre-ordinance revenues against post-ordinance revenues in three states (California, Utah, and Vermont) and six cities (Boulder, Colo; Flagstaff, Ariz; Los Angeles, Calif; Mesa, Ariz; New York, NY; and San Francisco, Calif). The study found that passage of smoke-free ordinances resulted in statistically significant increase in four localities, no significant change in four other localities, and a significant slowing in the rate of increase, but not a decrease, in one locality. In addition, there was no significant change when data were pooled across all localities. **Conclusion: Smoke-free ordinances do not appear to adversely affect, and may increase, tourism.**

2. **Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business?;** Hyland A, Cummngs KM, Nauenberg E. *Journal of Public Health Management Practice* 5(1): 14-21, 1999.

Abstract:

The objective of the study is to determine if New York's smoke-free ordinance impacted restaurants and hotels. Study found that real taxable sales from eating and drinking places and hotels in New York City increased (respectively by 2.1% and 36.9%) compared with levels two years previously. The same analysis found the remainder of the state experienced a 3.8% decline in restaurant and drinking place sales and only 2.4% increase in hotel sales. **Conclusion: Smoke-free ordinances did not impact negatively on restaurant or bars or hotel sales in New York City.**

3. **Restaurant Employment Before and After the New York City Smoke-Free Air Act;** Hyland A, Cummngs KM. *Journal of Public Health Management Practice* 5(1): 22-27, 1999.

Abstract:

The objective of the study was to examine the trends in the number of restaurant employees two years before and two years after the New York City smoke-free ordinance took effect. Between 1993 and 1997, New York City added 19,347 new jobs (18% increase) while the rest of the state added 7,423 new jobs (5% increase). **Conclusion: Smoke-free ordinances did not impact negatively on restaurant employment in New York City**

4. **Restaurateur Reports of the Economic Impact of the New York City Smoke-Free Air Act;** Hyland A, Cummins KM. *Journal of Public Health Management Practice* 5(1): 37-42, 1999.

Abstract:

The objective of the study was to determine the extent that restaurateurs have reported changes in business since enactment of the New York City smoke-free ordinance. A population-based cross-sectional telephone survey of 434 owners/managers of restaurants located in New York City was conducted. **Conclusion: There is no evidence to suggest that the smoke-free ordinance has had a detrimental effect on the City's restaurant business.**

5. **The Economic Effect of Smoke-Free restaurant Policies on Restaurant Businesses in Massachusetts;** Bartosch WJ, Pope GC. *Journal of Public Health Management Practice* 5(1): 53-62, 1999.

Abstract:

The objective of the study was to determine if smoke-free bylaws affected restaurant sales. The study compares meals tax data for 235 towns before and after the imposition of the smoke-free policy. The study failed to find a statistically significant effect on restaurant business. **Conclusion: the study provides evidence that local smoke-free policies do not cause a decline in communities' restaurant activity.**

6. **Prohibiting Smoking in Restaurants: Effects on Restaurant Sales;** Sciacca JP, Ratliff MI. *American Journal of Health Promotion* 12(3): 176-184, 1998

Abstract:

The objective of the study is to assess the impact of prohibiting smoking on total restaurant sales in Flagstaff, Arizona. Taxable restaurant sales were collected for Flagstaff and comparison areas in Arizona (two similar cities, three counties and the entire state). **Conclusion: findings indicate that prohibiting smoking in flagstaff restaurants had no effect on restaurant sales.**

7. **Environmental Tobacco Smoke Regulations Have Not Hurt Restaurant Sales in North Carolina;** Goldstein, AO; Sobel RA. *North Carolina Medical Journal* 59(5) 284-287, 1998

Abstract:

The objective of the study was to determine if no-smoking regulations in some counties of North Carolina affected adversely restaurant sales. Using sales tax data, the study found no statistically significant impacts. **Conclusion: Smoke-free ordinances do not affect restaurant sales, even in the number one tobacco producing state in the US.**

8. **Behaviour Intentions of the Public After Bans on Smoking in Restaurants and Bars;** Biener L, Siegel M. *American Journal of Public Health* 87(12): 2042-2044, 1997

Abstract:

The objective of the study was to determine through a random telephone survey if smoke-free ordinances would impact the behaviour of restaurants and bar patrons. Approximately 61% responded that their behaviour would not change, 30% predicted their use would increase, and 8% predicted a decline in patronage. **Conclusion: Smoke-free ordinances will likely lead to an increase in overall patronage.**

9. **The Effects of Ordinances Requiring Smoke-Free Restaurants and Bars on Revenues: A Follow-up;** Glantz SA; Smith LRA. *American Journal of Public Health* 87(10); 1687-1693, 1997

Abstract:

The objective of this study was to extend an earlier evaluation of the economic effects of ordinances requiring smoke-free restaurants and bars. Using the same method as in the earlier study (using sales tax data) but using updated data, the analysis was repeated. **Conclusion: Smoke-free ordinances do not adversely affect either restaurant or bar sales.**

10. **Review of Cornell Survey on Smoking Ban in New York City: Executive Summary;** Evans, MK. *Cornell Hotel and Restaurant Administration Quarterly* 37(5): 8-9, 1996

Abstract:

The Study is a critique of an earlier study by Corsun, Young and Enz (see below). The study identifies a number of problems with the study (incompleteness of the survey, incorrect inclusion of parameters, poor choice of time period, etc.). The author concludes that if corrections are made, revenues actually fell by 9 percent. **Conclusion: Structuring the analysis correctly shows that smoke-free ordinances do affect adversely restaurant sales.**

11. **Should NYC's Restaurateurs Lighten Up? Effects of the City's Smoke-Free Air Act;** Corsun DL, Young CA, Enz CA. *Cornell Hotel and Restaurant Administration Quarterly*, 37(2): 25-33, 1996

Abstract:

The objective of the study is to examine the effects of New York City's smoke-free bylaws. The findings include that smokers were eating out less, but that non-smokers were eating out much more and revenues actually increased. **Conclusion: Smoke-free ordinances actually increase restaurant revenues by attracting non-smokers.**

12. **Assessment of the Impact of a 100% Smoke-Free Ordinance on restaurant Sales – West Lake Hills, Texas, 1992 –1994,** Huang P, Tobias S, Kohout S, Harris M, Satterwhite D, Simpson DM, Winn L, Foehner J, Pedro L. *Morbidity and Mortality Weekly Report* 44(19): 370-372, 1995

Abstract:

Using sales tax data for eight restaurants in the town, a regression analysis was undertaken to determine whether the West Lake Hills smoking-free bylaw affected restaurant sales. **Conclusion: the regression coefficient was positive, suggesting that total sales of restaurants did not decrease after implementing the bylaw.**

13. **The Effects of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales;** Glantz SA, Smith LRA. *American Journal of Public Health* 84(7)' 1081-1085, 1994

Abstract:

The objective of this study is to determine if smoke-free ordinances hurt restaurant sales. Using sales tax data for 15 cities where smoke-free ordinances were in place and another 15 cities for control purposes, regression analysis was undertaken to analyze whether the proportion of restaurant sales declined as a proportion of total sales. **Conclusion: Smoke-free restaurant ordinances do not adversely affect restaurant sales.**

14. **The Impact of Tobacco Control Ordinances on Restaurant Revenues in California;** Maroney S, Stubblebine. *Claremont Institute for Economic Policy Studies* January 1994

Abstract:

This study uses taxable restaurant sales from 1986 to 1992 to test whether 16 city ordinances requiring restaurants be at least half non-smoking. The analysis also looked at sales tax data for areas within a 15-mile radius of each city to test for any increase in sales. **Conclusion: restaurant sales were not impacted by the ordinances in any city.**

15. **A Study of the Economic Impacts on San Luis Obispo Restaurants and Bars,** Taylor Consulting Group, prepared for City of San Luis Obispo, 1993

Abstract:

This study uses retail sales tax data to measure the impacts on restaurant and bars sales from San Luis Obispo's complete ban on smoking within the city. The time period was significant, from April 1985 to January 1992. **Conclusion: the ban on smoking does not appear to have had any impact on either restaurant or bar sales.**

16. **Effects of a City Ordinance Regulating Smoking in Restaurants and Retail Stores,** Sciacca, JP, Eckrem, *Journal of Community Health* 18(3): 75-182, 1993

Abstract:

This study randomly selected 61 restaurants in Flagstaff Arizona. Based on perceptions and sales data collected before and after the ordinance came into effect, it determined that the ordinance had no impact on sales or on the perception of sales.. **Conclusion: The smoking restrictions do not appear to have had any impact on restaurant sales.**