The Economic Impact of the 2011 Canada Winter Games Held in the Annapolis Valley of Nova Scotia: A Preliminary Assessment

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Introduction

The Annapolis Valley (Windsor-Digby) region of Nova Scotia is bidding to host the Canada Winter Games in 2011. The purpose of this study is to estimate the economic impacts of this proposed event on the Annapolis Valley economy. The study uses expenditure data from the 2003 Canada Winter Games (CWG, 2003) held in the Bathurst/Campbellton area of New Brunswick to estimate the economic impacts of hosting the 2011 Games. Figures for spending by visitors and the Host Society for facilities and operations come from the 2003 Canada Winter Games Economic Impact Assessment prepared by the Canadian Sports Tourism Alliance.

The impact of hosting the 2011 Games on the Province of Nova Scotia is expected to mirror the impacts of the 2003 Games in New Brunswick. The provincial impacts have been published in documents related to the 2011 Valley bid. A summary of these impacts appears in Appendix I. Since the focus of this study is to estimate the impact of the games at the regional level, spending estimates taken from 2003 games and preliminary 2011 estimates are summarized and injected into a regional input-output (I/O) model. The goal is to estimate the direct and spin-off (multiplied) impacts on the economy of the Annapolis Valley.

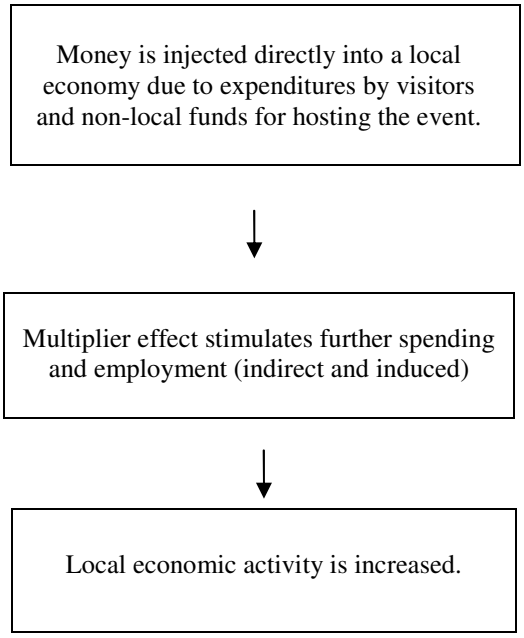
The Economic Impact Process

What is an Economic Impact Study?

An Economic Impact Study (EIS) involves estimation of incremental economic activity that results from a specific economic stimulus. Such stimuli include events, facilities, new industries and government policies. The goal of the impact analysis is to identify economic activity which would not occur in the absence of these stimuli, that is, incremental economic activity. The 2011 Canada Winter Games is a "sports tourism" event that will attract visitor spending and non-local funds for capital costs and operational expenditures. In order to fully assess the economic impact of activities/facilities, all (non-local source) related spending such as, venue construction and operation, accommodations, meals, transportation, shopping purchases, etc., which occur within the local community need to be considered . In addition, secondary or multiplied effects of these expenditures should be examined.

Conceptually, direct economic impacts are straightforward; non-local funds from hosting the games and non-resident visitors purchase goods or services during the games contributing to increased expenditures in the study area. These expenditures are received directly by local businesses. Indirect impacts, however, occur when a portion of the revenue received by local businesses is spent on other local goods and services. Induced impacts occur when the incomes created through the direct and indirect impacts are recycled throughout the local economy, generating additional activity. Although a clear distinction can be made between induced and indirect economic impacts, they are often considered to be a singular effect, referred to simply as indirect impacts. Figure 1 illustrates the basic sequence of events resulting from an injection of funds into a local economy. In general, economic impact analysis represents a method to assess the effects of specific services, policies or industries on a given area, usually in the form of incremental expenditures (sales), income, employment or taxes. Other variables that have been used include population growth, tax rates and property values.

Figure 1: The Impact of Non-resident Expenditures on Local Economic Activity



The Input Output Model

Input-output (I/O) analysis attempts to quantify, at a point in time, the economic interdependencies of an economy. I/O accounting is a framework that explicitly recognizes interdependencies among productive industries of the economy and the elements of final demand. Final demand is the demand for goods and services consumed directly by ultimate consumers. Final goods and services are referred to as final because they are not put back into the production process to make some other good. The interdependencies are characterized by the inter-industry structure, which shows the inputs that are combined to produce output. The I/O analysis framework is similar to a financial accounting framework that tracks purchases of and expenditures on goods and services in dollars. The I/O framework traces the dollar flows between businesses and between businesses and consumers in an economy.

The input-output model is summarized below in matrix form. Details of the model are discussed in Appendix II

$X^* = (1-A^*)^{-1} F^*$

Where:

X^* = the vector of total output
$(1-A^*)^{-1}$ = the closed model total requirements matrix (Leontief inverse)
F^* = vector of final demand changes associated with hosting the Canada Winter Games

2011 Games Related Expenditures and Multiplied Impacts

Direct spending associated with the games comes from three primary sources:

- Visitors
- Host Society Operational Expenditures
- Host Society Capital Expenditures

The direct expenditures and resulting economic impacts from each of these sources are reviewed in turn and then aggregated to provide the impact of the proposed 2011 Canada Winter Games on the Annapolis Valley economy.

Visitors to the Canada Winter Games

Visitor Types

Visitor types and associated numbers (from CWG, 2003) are given in Table 1. The average length of stay varies significantly by visitor type, ranging from spectators (5 days), participants and technical officials (7 days) to media/medical staff/provincial delegations (17 days).

Table 1 Visitor Types

Visitor Type	Number of Visitors
Participants	3200
Spectators	5112
Media	242
Provincial (Mission) Staff	180
Technical Officials	235
Medical	150
Sport Canada Delegation	38
Federal/Provincial Sports Ministers Group	69
Total	9226

Visitor Types Expenditure Profiles

Table 2 and Table 3 give expenditure profiles for the visitor types. The $2003 figures come from the 2003 Canada Winter Games. The $2011 figures are based on an annual inflation rate of 2.75 percent (the annual average for the Nova Scotia Consumer Price Index, 2001-2005) which

represents a (compounded) 24 percent increase from the 2003 figures. Only the $2003 figures will be referred to in the description of the impact process, the $2011 figures are for comparison purposes.

Table 2 Average Expenditure Per Trip Participant/Spectator

	Participant		Spectator	
	$2003	$2011	$2003	$2011
Expenditure Category				
# of Individuals	3200	3200	5112	5112
Public Transportation	-	-	1.40	1.74
Car Rental	-	-	39.18	48.58
Personal Vehicle Expenses	-	-	32.08	39.78
Taxi	-	-	1.29	1.60
Accomodations	-	-	139.91	173.49
Food & Beverage (Grocery)	6.36	7.89	24.99	30.99
Food & Beverage (Restaurants)	4.57	5.67	90.89	112.70
Recreation & Entertainment	1.46	1.81	8.06	9.99
Tickets	-	-	34.89	43.26
Event Merchandise Purchases	32.6	40.42	52.57	64.81
Other Retail Purchases	4.41	5.47	21.40	26.54
Other	2.86	3.55	3.17	3.93
Total Spending Per Trip	$52.26	$64.81	$449.83	$557.41
Total Spending Per Type	$167,232	$207,392	$2,299,531	$2,849,480

The data given in Table 2 and Table 3 come from surveys collected during CWG, 2003. Almost 500 athletes, coaches and mission staff were surveyed, as were 34 Technical Officials, 56 Mission Staff, 29 Media and 600 spectators. Medical Staff were assumed to have expenditures similar to the Technical Officials. Sport Canada representatives and members of the Federal/Provincial Sports Minister Group were assumed to mirror Media expenditures. Daily accommodation and meals (food and beverage) were provided by the Host Society for all groups except spectators. Since such expenditures are known, survey estimates in these categories are not used when aggregating visitor expenditures. Similar adjustments are made for participant transportation expenditures. Therefore, spending totals for visitor groups other than spectators (given in Table 2 and 3) are for reference purposes only. These figures are not used when calculating total visitor spending in order to avoid double counting that would occur when

expenditures by the Host Society on accommodation and transportation are included in the operational impacts.

Table 3 Average Expenditure Per Trip Officials/Staff/Media

	Technical Official		Provincial Staff		Media	
	$2003	$2011	$2003	$2011	$2003	$2011
Expenditure Category						
# of Individuals	200	200	180.00	180.00	242	242
Public Transportation	-	-	-	-	9.00	11.16
Car Rental	22.84	28.32	22.30	27.65	89.96	111.55
Personal Vehicle Expenses	14.84	18.40	-	-	14.69	18.22
Taxi	3.14	3.89	-	-	1.20	1.49
Accomodations	-	-	-	-	-	-
Food & Beverage (Grocery)	18.13	22.48	47.13	58.44	59.97	74.36
Food & Beverage (Restaurants)	108.33	134.33	104.43	129.49	274.36	340.21
Recreation & Entertainment	25.41	31.51	25.93	32.15	67.92	84.22
Tickets	3.71	4.60	3.20	3.97	1.80	2.23
Event Merchandise Purchases	96.35	119.47	87.54	108.55	52.92	65.62
Other Retail Purchases	28.26	35.04	48.94	60.69	30.13	37.36
Other	7.85	9.73	9.10	11.28	6.00	7.44
Total Spending Per Trip	$328.86	$407.79	$348.57	$432.23	$607.95	$753.86
Total Spending Per Type	$65,772	$81,557	$62,743	$77,801	$147,124	$182,434

Total Visitor Expenditures

Total visitor expenditures are estimated to be $2.6 million. Note that this is significantly lower than the $5.3 given in 2003 CWG summary. This difference arises because in the 2003 CWG study, spending by the host society on transportation, accommodation and meals was included in the visitor spending total where in this analysis, such spending is included under Host Society operational expenditures.

Table 4 Total Direct Expenditures by Visitors

Expenditure Category	SIC	SIC Descriptor	2003$	2011$
Public Transportation	G000	Transportation	21,079	26,138
Car Rental	G000	Transportation	353,230	438,005
Personal Vehicle Expenses	J000	Retail	124,871	154,840
Taxi	G000	Transportation	11,411	14,149
Accomodations	Q000	Food/Bev/Accom	283,569	351,625
Food & Beverage (Grocery)	Q000	Food/Bev/Accom	317,356	393,521
Food & Beverage (Restaurants)	Q000	Food/Bev/Accom	193,478	239,913
Recreation & Entertainment	R000	Other Services	261,011	323,653
Tickets	R000	Other Services	88,368	109,577
Event Merchandise Purchases	J0000	Retail	652,587	809,208
Other Retail Purchases	J0000	Retail	269,847	334,611
Other	R000	Other Services	58,737	72,833
Total			$2,635,543	$3,268,073

Total (Multiplied) Impacts of Visitor Spending

Visitor expenditures cannot simply be injected into the I/O model to generate the total (multiplied impacts) on the local economy. Some spending flows directly out of the region because sales taxes flow directly to federal and provincial governments. Other expenditures made at retail outlets need to be adjusted for retail/wholesale trade and transportation “margins” (markups)

because a portion of the retail price of a good is made up of costs associated with these industries. The details related to tax leakages and margining are contained in Appendix II.

The taxes/margin adjustments factor out leakages from the local economy and reduce visitor expenditure of $2.6 million to a final demand figure of $1.3 million. This change in final demand creates a multiplied impact on the local economy. The regional I/O model adjusts for leakages due to taxes, trade margins and non-local production and consumption. Therefore, inserting the visitor expenditure figures from Table 4 into the I/O model yields the results which appear in Table 5.

Expenditure by visitors to the Games creates a total of $2.2 million in expenditures across all Valley industries, including $657 thousand in Other Services (which includes expenditures on event tickets and other entertainment industries) and $459 thousand in both the Accommodation/Food/Beverage Sector and Retail Sales Sector. Total income creation in the Valley economy is approximately $1 million ($954 thousand).

Table 5 Total Impacts Visitor Expenditures

Total Direct/Indriect/Induced Impacts	$2003	$2011
Division A - Agricultural and related service industries	11,940	14,806
Division B - Fishing and trapping industries	433	536
Division C - Logging and forestry industries	4,101	5,085
Division D - Mining (including milling), quarrying and oil wells	1,487	1,844
Division E- Agg Manu	36,076	44,734
Division F – Construction industries	14,924	18,505
Division G - Transportation and storage industries	62,309	77,264
Division H - Communication and other utility industries	65,753	81,534
Division I - Wholesale trade industries	237,636	294,669
Division J - Retail trade industries	451,818	560,254
Division KL - Finance, Insurance, Real Estate	182,351	226,115
Division M - Business service industries	37,680	46,724
Division O - Educational service industries	327	406
Division P - Health and social service industries	14,422	17,883
Division Q - Accommodation, food/beverage service industries	451,496	559,855
Division R - Other Services	656,732	814,348
Industry Sum	$2,229,486	$2,764,562
Household Income	$954,771	$1,183,916

Capital Expenditures

The preliminary capital budget for the 2011 Canada Winter Games totals $10.2 million. The details appear in Table 6.

Table 6 Winter Games 2011 Canada – Preliminary Budget

Capital Budget Revenue		**Operating Budget Revenue**	
Government of Canada	$2,000,000	Government of Canada	$5,000,000
Province of Nova Scotia	2,000,000	Province	2,000,000
Municipal Government	2,000,000	Other Government	12,500
Other contributions	4,220,000	Friends of the Games	9,000,000
		Tickets and merchandising	3,441,500
Total revenue	**$10,220,000**	Special events	200,000
		Other income	1,075,000
Expenditure		Interest income	950,000
Ceremony venue	1,000,000	Asset recovery	225,000
Other facilities			
Ice sports	3,000,000	**Total revenue**	**$21,904,000**
Indoor sports	2,000,000		
Ski Martock		**Expenditure**	
Alpine skiing	279,000	Administration/volunteer services	3,138,000
Biathlon	45,000	Athletes Village	2,594,000
Cross-country skiing	75,000	Athletes transportation	1,557,500
Free style skiing	465,000	Culture	1,115,500
Snowboarding	248,000	Executive	404,000
Other equipment and enhancements	3,108,000	Facilities	1,318,000
		Finance	43,000
Total expenditure	**$10,220,000**	Friends of the Games	433,500
		Human Resources	1,963,000
Excess of revenue over expenditure	**0**	Language services	200,000
		Legal	52,000
		Logistics	1,069,500
		Marketing	1,987,500
		Medical	221,500
		Merchandising	1,260,000
		Protocol and ceremonies	541,000
		Special projects	457,500
		Sport	1,269,000
		Provision for wind-up costs	43,500
		Other operating expenses	2,000,000
		Total expenditure	**$21,668,000**
		Excess of revenue over expenditure	**$236,000**

To estimate the total (direct/indirect/induced) impacts on the Valley economy from these expenditures $7.1 million was allocated to the construction industry and $3.1 million (Other equipment and enhancements in the budget) to retail sales. This assumes that all construction projects would use local companies and that all equipment purchases would be made through local suppliers. To the extent that non-local companies were involved, the impacts would be accordingly diminished.

The impacts on the Valley economy generated from the 2011 Game's $10.3 million in capital expenditures appear in Table 7. Not surprisingly the biggest impact is in the Construction sector ($8.4 million), followed the Retail Trade industry ($1.2 million), Finance Insurance and Real Estate ($0.8 million) and Business Services ($0.3 million). Total income generated in the local economy is estimated to be $5 million.

Table 7 Total Impacts Capital Expenditures

Total Direct/Indriect/Induced Impacts	$2003	$2011
Division A - Agricultural and related service industries	91,945	114,012
Division B - Fishing and trapping industries	1,152	1,428
Division C - Logging and forestry industries	77,678	96,321
Division D - Mining (including milling), quarrying and oil wells	35,376	43,866
Division E- Agg Manu	90,588	112,329
Division F – Construction industries	8,427,251	10,449,791
Division G - Transportation and storage industries	141,851	175,896
Division H - Communication and other utility industries	230,389	285,682
Division I - Wholesale trade industries	825,842	1,024,045
Division J - Retail trade industries	1,168,457	1,448,887
Division KL - Finance, Insurance, Real Estate	795,075	985,893
Division M - Business service industries	271,920	337,181
Division O - Educational service industries	1,702	2,111
Division P - Health and social service industries	74,913	92,892
Division Q - Accommodation, food/beverage service industries	156,295	193,806
Division R - Other Services	187,560	232,574
Industry Sum	$12,577,994	$15,596,713
Household Income	$4,968,892	$6,161,426

Operational Expenditures

The preliminary operating budget for the 2011 Canada Winter Games totals $21.7 million. The details appeared in Table 6. Estimating the total (direct/indirect/induced) impacts on the Valley economy from the operational expenditures means apportioning the expenditures into the applicable Standard Industrial Classification (SIC) Industries and injecting these expenditures into the I/O model. It is assumed that all operational expenditures are made locally. Again, to the extent that non-local companies were involved, the impacts would be accordingly diminished.

The impacts on the Valley economy generated from the 2011 Game's $21.7 million in operational expenditure appear in Table 8. Total local expenditures generated from the operational component of the Games are $30 million. The industries with the largest expenditure impacts include Business Services ($6million), Accommodation/Food/Beverage ($3 million), Finance, Insurance,Real Estate ($2.5 million), Transportation Industries and Retail Sales with $2 million each. Total income generated in the Valley economy is estimated to be $13 million.

Table 8 Total Impacts Operational Expenditures

Total Direct/Indriect/Induced Impacts	$2003	$2011
Division A - Agricultural and related service industries	127,271	157,816
Division B - Fishing and trapping industries	4,578	5,677
Division C - Logging and forestry industries	48,172	59,733
Division D - Mining (including milling), quarrying and oil wells	22,473	27,867
Division E- Agg Manu	351,591	435,973
Division F – Construction industries	191,733	237,749
Division G - Transportation and storage industries	2,068,771	2,565,277
Division H - Communication and other utility industries	1,032,214	1,279,946
Division I - Wholesale trade industries	788,290	977,480
Division J - Retail trade industries	2,014,024	2,497,389
Division KL - Finance, Insurance, Real Estate	2,448,955	3,036,705
Division M - Business service industries	6,080,500	7,539,820
Division O - Educational service industries	4,547	5,638
Division P - Health and social service industries	421,860	523,107
Division Q - Accommodation, food/beverage service industries	3,095,923	3,838,944
Division R - Other Services	10,986,689	13,623,494
Industry Sum	$29,687,592	$36,812,614
Household Income	$13,271,775	$16,457,001

Total Impacts

Table 9 shows the total (direct/indirect/induced) impacts on the Annapolis Valley from hosting the 2011 Canada Winter Games. Table 9 aggregates the impacts generated by visitor expenditures (Table 4), Host Society capital expenditures (Table 7) and Host Society operational expenditures (Table 8). It is estimated that the 2011 Canada Winter Games would produce almost $45 million in total expenditures and approximately $20 million in income in the Valley economy. The expenditures impact all industries in the Valley economy to some extent (via the multiplied effect) but are concentrated in the Other Service industries - which includes event tickets and other entertainment firms - ($11.7 million), Business Services ($6.4 million), Accommodation/Food/Beverage industries ($3.7 million), Retail Sales ($3.6 million), Finance Insurance and Real Estate ($3.4 million) and Transportation ($2.3 million). Total income created is $19.2 million. The $19 million in household income divided by a 2003 average wage of $25,500 (Statistics Canada 2001 Census adjusted for inflation at 2.75% percent) translates into approximately 750 person years of employment.

Table 9 Total Impacts 2011 Canada Winter Games Related Expenditures

Total Direct/Indriect/Induced Impacts	$2003	$2011
Division A – Agricultural and related service industries	231,156	286,634
Division B - Fishing and trapping industries	6,163	7,641
Division C - Logging and forestry industries	129,951	161,139
Division D – Mining (including milling), quarrying and oil wells	59,336	73,577
Division E- Agg Manu	478,255	593,036
Division F – Construction industries	8,633,908	10,706,045
Division G - Transportation and storage industries	2,272,931	2,818,437
Division H - Communication and other utility industries	1,328,356	1,647,162
Division I - Wholesale trade industries	1,851,768	2,296,194
Division J - Retail trade industries	3,634,299	4,506,530
Division KL - Finance, Insurance, Real Estate	3,426,381	4,248,713
Division M - Business service industries	6,390,100	7,923,725
Division O - Educational service industries	6,576	8,155
Division P – Health and social service industries	511,195	633,882
Division Q – Accommodation, food/beverage service industries	3,703,714	4,592,605
Division R - Other Services	11,830,981	14,670,416
Industry Sum	$44,495,072	$55,173,889
Household Income	$19,195,438	$23,802,343

Summary

The purpose of the study was to estimate the economic impact on the Annapolis Valley from hosting the 2011 Canada Winter Games. The study uses expenditure data from the 2003 Canada Winter Games held in New Brunswick and preliminary estimates of capital and operational spending put forth by the Annapolis Valley Working Group bidding for the games. Direct spending estimates from these documents were injected into a regional input-output (I/O) model to estimate the direct and spin-off (multiplied) impacts on the economy of the Annapolis Valley. The regional I/0 model accounts for leakages from the local economy related to taxes, trade margins and non-local production as well as multiplied (indirect and induced) impacts.

Direct spending by visitors to the 2011 games (athletes, spectators, mission staff, medical and technical personnel, media, etc.) is projected at $2.6 million. Spending for accommodation/meals/transportation for participants is not counted in this total as it is included under the Host Society's operational expenditures. Total (direct/indirect/induced) expenditures stemming from the visitor spending and captured in the Valley economy are estimated at $2.2 million, creating about $1million in local income. Direct capital expenditures for the 2011 Games are estimated at $10.3 million. The total (multiplied) impact of these expenditures is approximately $13 million in output (spending) and with resulting income of $5 million.
Operational expenditures are projected at $21.7 million, generating $30 million in total expenditures and $13 million in income. In total, it is estimated that the 2011 Canada Winter Games would produce almost $45 million in total expenditures and approximately $20 million in income in the Annapolis Valley economy.

In conclusion, it must be emphasized that the impacts discussed above are based on past Games (2003) and preliminary estimates for the 2011 Games. The impacts also include a number of simplifying assumptions regarding the geographical area and sources of the expenditures. For example, it was assumed that all construction expenditures would be captured by local firms and that all Host Society spending was incremental to the Annapolis Valley economy. As the 2011 Games bid progresses, more detailed accounts of spending and funding sources will emerge. The emergence of these details will allow fine-tuning of the local/non-local nature of the direct and spin-off impacts and allow a more precise analysis of the incremental impacts. Therefore (as stated in the document title) the current impact assessment must be treated as preliminary in nature.

Appendix I

Estimated Impacts 2011 Canada Winter Games on the Province of Nova Scotia

Potential Provincial Impact by source ($000's)

*2011 estimates are based on a 2.75% annual cost of living increase (24% total) from the 2003 games

	Operations		Capital		Visitor		Total	
Category	2003	2011	2003	2011	2003	2011	2003	2011
Initial Expenditure	$11,595	$14,378	$21,807	$27,041	$5,300	$6,572	$38,702	$47,990
Industry Output	$26,358	$32,684	$33,989	$42,146	$10,016	$12,420	$70,363	$87,250
GDP	$12,148	$15,064	$12,194	$15,121	$ 4,233	$ 5,249	$28,575	$35,433
Wages & Salaries	$ 9,795	$12,146	$ 7,798	$ 9,670	$ 2,911	$ 3,610	$20,504	$25,425
Jobs	465	465	362	362	188	188	1,015	1,015
Taxes - of which	$ 4,445	$5,512	$ 3,959	$ 4,909	$ 1,976	$ 2,450	$10,380	$12,871
Federal	$ 1,959	$ 2,429	$ 1,781	$ 2,208	$ 843	$ 1,045	$ 4,583	$ 5,683
Provincial	$ 1,790	$ 2,220	$ 1,614	$ 2,001	$ 899	$ 1,115	$ 4,303	$ 5,336
Municipal	$ 696	$ 863	$ 564	$ 699	$ 235	$ 291	$ 1,495	$ 1,854

*Source: Canadian Sports Tourism Alliance Sports Tourism Economic Impact Assessment Model (STEAM)

Detailed Industry Results ($000's)

*2011 estimates are based on a 2.75% annual cost of living increase (24% total) from the 2003 games

	GDP		Jobs	
Industry	**2003**	**2011**	**2003**	**2011**
Retail Trade	$5,269	$6,534	250	310
Finance, Insurance & Real Estate	$2,706	$3,355	75	93
Manufacturing	$1,910	$2,368	87	108
Construction	$5,110	$6,336	88	109
Services – of which	$9,567	$11,863	359	445
Accommodation	$ 742	$ 920	41	51
Food & Beverage	$ 859	$ 1,065	64	79
Other Services	$ 7,937	$ 9,842	253	314

*Source: Canadian Sports Tourism Alliance Sports Tourism Economic Impact Assessment Model (STEAM)

Appendix II

Converting Expenditures to Final Demand Changes

Visitor expenditures therefore need to be converted to final demand changes by accounting for wholesale, retail and transportation margins, as well as identifying direct leakages related to non-local production and taxes. Details of the conversions of visitor expenditures to final demand changes are discussed below.

Sales Tax Adjustments

Most goods and services in Kings County are subject to the GST tax of 15 percent collected at the point of sale and remitted to the federal and provincial governments. The GST is a value added tax. Retailers add it to the price of goods sold. Businesses pay the GST on goods received, charge GST on their sales and remit the difference to the government. Some products, such as food items purchased at grocery stores are exempt from the GST. There is no GST charged on gasoline retailed to consumers. For gasoline, all taxes are levied at the producer level and included in the cost of gas sold to retailers. To account for GST leakages outside the local economy, tourist expenditures for all categories are reduced by the applicable GST rate when converting sales figures to local final demand.

Trade Margin Adjustments

Visitor expenditures are equal to output attributable to visitors for all tourism expenditures except that associated with retail trade. Output generated by tourist retail spending is limited to the trade margins (the difference between the price charged for the good and the cost of acquiring that good). The margining process involves multiplying the value of retail sales by the wholesale and retail margins wholesale and retail trade industries respectively. The aggregate retail trade industry margin (adjusted for direct leakages via location quotients) is 25.7 percent (of the purchaser price) and the aggregate wholesale trade margin is 14.6 percent. Retail sales expenditures, less wholesale and retail trade margins, are usually adjusted for transportation margins with the remainder (the producer price) being apportioned to the producing industry (usually manufacturing). In this model, since all goods sold are assumed to be imported into the region, leakages associated with transportation margins and non-local production are accounted for by treating the cost of the goods sold as imports.

Appendix III

The Annapolis Valley Input-Output Model

The Nova Scotia input output (I/O) model forms the basis of the Annapolis Valley I/O model. The provincial I/0 model for Nova Scotia is based on Statistics Canada data and produced by CANMAC Economic Consulting Ltd. The provincial I/0 direct requirements matrix was obtained from the NS Department of Finance and adjusted via employment based location quotients (LQ) to approximate the Annapolis Valley economy. The location quotient in this case is a measure comparing the concentration of an industry in Kings County and its concentration in the province of Nova Scotia as a whole.

Location quotients were calculated for each industry (excluding households). The rows of the direct requirements matrix are adjusted based on the LQ values. It is assumed that all wage payments are made to county residents, profits are treated as leakages and no adjustment is made for commuters. After adjusting the direct coefficients via the location quotients, the model is transformed into the total requirement matrix via the Leontief inversion technique described earlier. Given changes in final demand generated by the games, the model can be solved to estimate indirect and induced impacts on the local economy.

The model is closed with respect to households. In the standard or open model, household consumption is a column vector located in final demand and household income (comprised of wages/salaries/profits and other income) is a row vector contained in value added. When the model is closed with respect to households, the household row and column vector are incorporated into the endogenous (inter-industry) matrix. The processing sector is therefore expanded to include households as an industry and the inter-industry matrix reveals the relationships between the household industry and all other industries. As a result, the household sector is no longer exogenous but is now part of the internally determined portion of the model and therefore endogenous. The inclusion of households in the processing sector assumes part of the analysis is to assess not only the impacts of inter-industry purchases but also the effects of household spending on the economy.

The closed model allows the direct, indirect and induced effects of an exogenous change to be captured. The inclusion of households in the inter-industry portion of the table results in multipliers that reflect not only the direct and indirect purchases from the household industry (labour inputs) by other industries but incorporates the effects of household income being re-spent in the economy. The economic activity resulting from the re-spending of income generated by the direct and indirect effects is known as the induced effect. The induced impacts are additional expenditures resulting from increased income brought about by increases in final demand.

One assumption inherent in the induced effects is that household income flows to residents and these residents spend their new income following the pattern of expenditures identified in the household expenditure column of the inter-industry matrix. Given the assumed leakages from the local economy (related to production of goods and industry profits), the closed model is most applicable due to its ability to capture the induced effects associated with the re-spending of income created via the direct and indirect effects.