Yukon College
Economic Impact Assessment and Cost-Benefit Analysis

FINAL REPORT

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Executive Summary

The purpose of this study is to develop an objective quantitative assessment of Yukon College's impact on the economy of the Yukon and to calculate the costs and benefits of the College to society, governments, and students. Prudent assumptions and sound analytical techniques have been used throughout to avoid inflating benefits or underestimating costs.

HIGHLIGHTS

- **Yukon College injects $21.9 million into the Yukon economy and employs about 650 full-time and part-time people. Yukon College is responsible for 245 person-years of employment.**
- **Yukon College community campuses are an important part of the economy of many rural Yukon communities.**
- **The overall social rate of return to the investment in Yukon College is 8.5% per year. Total long-term benefits generated by the College are almost double the total costs.**
- **Students benefit from a 14.7% rate of return on their investment in time and money to study at Yukon College.**
- **Governments and taxpayers get more than their money back from spending on Yukon College. Future tax revenues and reductions in social program costs result in a rate of return to taxpayers of 4.8% per year during the working life of Yukon College students.**

Direct impacts

Direct impacts stem from Yukon College's spending, but do not take into account the effect of the College's spending on other industries:

Table 1: Summary of Yukon College direct economic impacts, 2002

Total injection (spending)	$21.9 million
Direct Value Added by College	14.2 million
Imports	3.0 million
Exports	0.2 million
Labour income	14.8 million
Tax revenues generated	2.6 million
Employment (full-time)	151 persons
Employment (part-time)	495 persons
Total person-years	216.1 PY

The direct value added by Yukon College is the difference between total revenue of $20.7 million and total purchases of $6.5 million. The exports of approximately $0.2 million consist of the tuition fees charged to international students — no estimate of their spending in the Yukon is included. The labour income of $14.8 million consists of all the College's labour expenditures — wages, salaries, and benefits — on permanent, casual, and contract employees. Tax revenues generated include an estimate of income taxes paid by College employees plus the net GST remitted by the College bookstore.

Total Yukon Economic Impacts: Direct & Indirect

Table 2 below summarizes the total direct and indirect impact of Yukon College on the Yukon's GDP and on employment in the territory using multipliers from Statistics Canada's 1999 Inter-provincial Input-Output model. Indirect impacts arise from the College's spending on goods and services from Yukon firms. Induced impacts (from College employees spending their wages) are not included, as Statistics Canada no longer calculates those multipliers.

Table 2: Summary of Yukon College impact: direct & indirect, 2002

		Yukon economy		*Canadian economy*	
	Direct impact ($millions)	*Multiplier (per $1 million spending)*	*Direct & indirect impact ($millions)*	*Multiplier (per $1 million spending)*	*Direct & indirect impact ($millions)*
Spending/Output	$21.9	1.13	$24.8	1.31	$28.7
Employment (Person-Years)	216	11.19	245	13.13	288
Value added (GDP)	$21.9	0.84	$18.4	0.94	$20.6
Imports	$3.0	n/a		0.06	$1.2
Exports	$0.2	n/a		n/a	
Tax revenue	$2.6	n/a		n/a	

Note: n/a means no multiplier is available.

The Value added (GDP) multiplier is less than one because of economic leakages such as imports, savings, and taxes.

The College represents between 1.5 and 1.8 per cent of the Yukon's $1.2 billion GDP. Comparing it to value added for other industries in 2001, the college is larger than the oil and gas industry in terms of value-added to the Yukon economy, and about the same size as utilities (electricity generation and water & sewer services) and hospitals.

The 191 term or permanent employees at Yukon College represent about 1.3% of the Yukon's labour force. However, if all people who worked for Yukon College are counted, about 4.3% of the Yukon's labour forced worked for the College at some point in 2002.

Community Level Economic Impacts

The total local income and employment impacts for the 13 Yukon communities in which the College has a presence was calculated using Informetrica Limited's Local Area Impact Model.

For the rural communities, the College's impact ranged from a low of 0.4% of total income in Beaver Creek to a high of 4.5% of income in Pelly Crossing. Employment impact in the rural communities ranged from a low of 0.8% of employment in Beaver Creek to a high of 8.0% in Carcross.

Costs & Benefits

Not surprisingly, expenditure on the College yields a net benefit to society. The benefits from expenditure on higher education have been shown to exceed the costs in numerous studies across the world. The following is a summary of the costs and benefits at the Canada level. Based on the assumptions outlined in the report, net benefits of one year's operation of Yukon College are estimated at $35.5 million. Total private and social costs amounted to $47.8 million while private and social benefits are estimated at $83.1 million. This stream of costs and benefits yields an overall social rate of return of 8.5% per year over the working life of students. On average, students see a return of 14.7% per year on their investment of money and time pursuing a Yukon College education. Governments get a 4.8% return on their expenditures on Yukon College.

Table 3 Summary of costs and benefits for one year (2002) of Yukon College operation

Costs	
Direct College Operating Costs	$21,927,214
Cost of tuition and educational supplies purchased by students	726,225
Opportunity Cost of students' time	22,292,281
Increased Employment Insurance Payments	1,103,143
Reduced Transfer Payments receipts by individuals	1,721,673
Total Costs	47,770,536
Benefits	
Increased income for students	$69,376,027
Savings by students remaining in the Yukon	804,000
Intrinsic value of taking courses for interest by non-degree taking students	Not Available
Value of locally available training	5,209,000
Improved health	4,283,128
Reduction in transfer payments costs	1,721,673
Increased EI income by individuals	1,103,143
Value to community of use of College facilities	41,000
Exports	233,067
Crime reduction	294,275
Other positive externalities – not measured	Not Available
Total Benefits	$83,065,312
Net benefit	**$35,294,777**

Other Positive Externalities

In addition to the benefits estimated in Table 3 above, there are a number of positive benefits that the College brings to the Yukon and Yukoners that are "intangible" – i.e. they cannot be measured in dollar terms. These include: the value of a skilled labour force to potential investors, the intrinsic value of taking courses for interest, community stability and other synergies, the provision of cheap part-time labour by students, and the stimulation of research and development activity in the Yukon.

Of these, the value of a skilled labour force (and the ready availability of the means to further educate and train workers) to potential investors has the largest potential impact. Capital is highly mobile and the skill and education level of the local labour force is one of the key factors in firms making investment decisions.

Glossary

Gross Domestic Product (GDP):
- The total dollar value of all final goods and services produced within an economy.
- Used to measure the size of an economy but does not include things that are valuable but are not bought or sold (e.g. subsistence hunting or unpaid housework).
- Three different ways to measure it (which should amount to the same):
    - Expenditure: adding up consumer spending, gross capital expenditures, government spending on goods and services and net exports
    - Income: adding up everyone's wages and salaries, profit, rents, interest income (with some adjustments for depreciation and indirect taxes such as GST)
    - Value added: adding up all the value added directly produced by each industry.

Input-output model:
- A set of numbers showing how goods and services move between different industries in an economy.

Labour income:
- Total of what workers get paid including not just wages or salaries, but also benefits such as pension and dental plans.

Multiplier:
- A number that allows the calculation of the effect increased spending in one industry has on the whole economy.

Present value:
- The value right now of something that will produce benefits or costs in the future.
- Use present value because a dollar today is worth more than a dollar 10 years from now.
- Used to compare current expenditures with future benefits (or vice-versa)
- The basic idea is how much money does one need to put in the bank today to obtain the same amount of money in the future as the anticipated action.

Transfer payments:
- Payments from governments to individuals or businesses, for which the government does not receive any goods or services.
- These include: social assistance, pensions, employment insurance, GST rebates, workers' compensation payments, pensions, subsidies to businesses, etc..

Value added:
- The difference between the revenue of an organization and the cost of the goods it buys.
- Normally includes wages, interest, rent, and profit (for firms).
- What each industry or enterprise adds, by itself, to the economy.

Preface: Phase I Précis

In Phase I of this project the study team reviewed a number of post-secondary institution economic assessment studies and evaluated the economic models used based on their methodological soundness, their applicability to the Yukon and to Yukon College, their data requirements and the availability of required data in the Yukon. Phase I resulted in the 8 recommendations listed below, all of which were accepted by the Steering Committee.

Recommendation 1: An EIA should be done at the territorial level.

Recommendation 2: Community level EIAs could be done for the communities where Yukon College has a campus.

Recommendation 3: Use Statistics Canada's Input-output model to estimate induced and indirect impacts on the Yukon level.

Recommendation 4: If Community level EIAs are required, use Informetrica's Local Area Impact Model (LAIM) to calculate the impacts on each community.

Recommendation 5: A cost-benefit analysis of Yukon College should be conducted.

Recommendation 6: The cost-benefit analysis could be based on the CCBenefits model adapted to Yukon and Canadian data sources and issues.

Recommendation 7: Two cost-benefit analyses should be done: one at the Canadian level, and another adjusted to apply to the Yukon only.

Recommendation 8: The cost-benefit analyses could take into account and report on the differential impacts on First Nations.

The CCBenefits model was chosen as the starting point for conducting a cost-benefit analysis because it is by far the best model for conducting both cost-benefit analyses and EIAs of post-secondary educational institutions. The CCBenefits model is rigorous, thorough and complete. Its assumptions are laid out, explained and defended. The methodology is solidly grounded in the economic literature. The model is American and so will need to be adapted to Yukon and Canadian data sources and issues — e.g. due to Canada's socialized medical system, the societal benefits of the improved health correlated with higher education are greater than in the US.

Contents

List of Tables

Yukon College Economic Impact Assessment and Cost-Benefit Analysis

FINAL REPORT

1 Introduction

The purpose of this study is to develop an objective quantitative assessment of Yukon College's impact on the economy of the Yukon and to calculate the costs and benefits of Yukon College to society, governments and students. The Terms of Reference required dividing the project into two phases: a first phase reviewing other studies and recommending an approach to be used in the Yukon College case; and a second phase actually undertaking the economic assessment work based on the Phase I recommendations. This report is the result of the Phase II work. A précis of the Phase I report — with its 8 recommendations — can be found in the Preface of this paper.

The Request for Proposals outlined the following as the minimum specific issues to be addressed by the economic assessment of Yukon College:

Direct benefits:

- *expenditures of the College, its employees, its students and visitors*
- *additional business volume generated by expenditures (re-spending multiplier)*

Indirect benefits:

- *improved earning power of students attending Yukon College*
- *taxes returned to the Yukon*
- *impact on social and health costs in the Yukon*
- *value of services provided to community and community organisations*

These study objectives suggested the use of two separate and quite different analytical frameworks — economic impact assessment (EIA) and cost-benefit analysis (CBA). In addressing what are termed direct benefits above, as well as the impact on taxes, one would in fact be conducting an economic impact analysis of the College. EIA measures the impact of a spending injection on other economic variables, usually including employment, Gross Domestic Product (GDP), income, and tax receipts. EIA is the analytical tool that uses multipliers. In addressing the indirect benefits, one would be conducting a form of cost-benefit analysis.

Phase I confirmed the need to conduct both an EIA and a CBA if all of the objectives were to be met.

The Steering Committee has made it clear that Yukon College needs a model that, as Christophersen and Robison so aptly state,

> … provides relief from the all-too-common "advocacy analyses" that inflate benefits, understate costs, and thus discredit the process of higher education impact assessment. [Christophersen & Robison, Exec Summary, p.1]

1.1 The economic role of education

Although not a requirement of the project, the wider role education plays in an economy deserves at least a brief mention in a discussion of the economic impact of Yukon College.

In early economic theory, the role of education was not explicitly considered. Labour was one of the three factors of production, alongside land and capital (plant and equipment). The availability of all three factors — and in what proportion — was considered critical in determining a nation's economic output. But the skills and education of those labouring were not deemed important. As economic theory has evolved, however, the thinking around education and its role in economic production has changed considerably. Joseph Stiglitz — a Nobel laureate in economics — sums up the basics of current economic thinking on education in his introductory textbook.

> "The nation's output depends not only on the number of hours people work but also on how productive those hours are. One of the important determinants of workers' productivity — and therefore wages — is education."[1]

Individuals clearly gain economically from higher levels of education. The wage differentials between those with higher and lower levels of educational attainment are considerable. For example, the average wage of Canadian workers with four years of university education is two thirds higher than workers whose formal education ended with a high school diploma.[2] The wage differential is due in part to specific skills or learning gained in the course of further education, and in part to the signal that completing further education sends to prospective employers. Completing a higher level of education is crucial to send the signal that an individual is not only educated or skilled, but has the discipline and drive to stick to a long-term effort.

Does society as a whole benefit from higher levels of education? The Organization for Economic Co-operation and Development writes:

> "There is ample evidence that more secondary and tertiary education for young people improves their individual economic and social prospects. There is also growing, albeit less direct evidence, of a pay-off for societies at large from having a more highly educated population."[3]

[1] Stiglitz and Boadway. 1997. Principles of Microeconomics. p.140
[2] Ibid. p.143
[3] OECD p.17

2 Approach and Methodology

The approach used in this study is inspired by the CCBenefits model. In addition to being used to assess numerous educational institutions in the United States, the model was recently applied to community colleges in Alberta. This study uses two separate approaches in examining the economic effects of Yukon College: Economic Impact Analysis (EIA) and Cost-Benefit Analysis (CBA).

Cost-benefit analysis and economic impact assessment are two very different frameworks used by economists to assess projects or other discrete contributors to an economy. They have very different data requirements and differ fundamentally in their time dimension. EIA looks at annual impacts in a given year or annually over a certain period, while CBA adds up discounted costs and benefits over an extended period.

2.1 Economic Impact

Economic Impact Analysis uses tools developed in macroeconomic analysis. EIA evaluates the total effect an injection of funds (or economic "shock") attributable to an institution has on a series of regional or national macroeconomic variables including GDP, employment, labour income, and government finances. An EIA presupposes the injection of funds into the economy. In the case of Yukon College, the injection would include all spending by the College, including territorial, federal and private funding.

Economic impacts are usually classified as direct, indirect, or induced. Direct impacts flowing from an institution in a local economy, for example, would include the jobs created at the institution and the resulting increase in employment income, local GDP and tax receipts. Indirect impacts would be the increased employment, etc., created by the institution purchasing goods and services from local suppliers. Finally, induced impacts are the increased employment, etc., created by the spending of the institution's own employees in the community. The scale of indirect and induced impacts is heavily dependent on the size and diversity of the local economy. If more goods and services are available locally, there tends to be less leakage out of the local economy and indirect and induced impacts will be greater.

The calculation of indirect and induced impacts requires the use of multipliers. Total institution payroll, for example, is multiplied by a pre-set figure to arrive at the number of induced jobs created in the local economy through employee spending. The use of multipliers can often be contentious. Custom multipliers can be estimated from knowledge of a local economy and surveys of peoples spending habits, multipliers can be derived from existing models of local economies (e.g. based on business diversity), or Statistics Canada's inter-provincial input-output model can be used.

2.1.1 Yukon Economic Impacts

The economic impact analysis uses detailed financial information provided by Yukon College as the necessary base data required to calculate all impacts. The direct impacts of the College on the Yukon's GDP, employment, labour income, imports, exports, and tax receipts are calculated from this data.

Total Yukon impacts — direct and indirect — are calculated using the multipliers from Statistics Canada's 1999 Inter-provincial Input-Output model (see Section 3.2.1 below). Indirect impacts are also analysed through a detailed examination of the College's spending.

Induced impacts have not been included in the major part of this analysis because of the lack of appropriate multipliers (see Section 3.3 below for a more detailed discussion). Induced impacts *are* included in the community level impact assessments only because they are an integral part of the model used.

2.1.2 Community Level Impacts

The analysis of community level impacts relies on data provided by Yukon College showing labour and non-labour expenditures in each of the 13 Yukon communities in which the College has a presence. Community impacts are estimated using Informetrica Limited's Local Area Impact Model (see Chapter 4 below).

2.2 Cost-Benefit

Cost-benefit Analysis stems from a microeconomic perspective. It attempts to add up all private and social costs and benefits of an institution and come up with a single dollar measure of net social benefit or a ratio of dollar costs to dollar benefits. The time stream of costs and benefits are discounted using some appropriate "social discount rate" to obtain a present value of costs and benefits. Unlike EIA, private and public expenditures and investments are viewed as costs since they consume societal resources that could have alternative uses. Other costs include on-going operating costs, as well as costs imposed on those who do not benefit from the project ("negative externalities" – e.g. pollution, noise, reduction of property values, etc.). Benefits are usually measured using the concept of consumer surplus or willingness to pay for certain goods and services, including the value of "positive externalities". Improved health and reduced Social Assistance costs are examples of positive externalities generated by the College.

In many cases, prices do not exist for benefits (e.g. for improved societal health, improved individual wellbeing etc.) and different methods have been devised to estimate the willingness to pay. The quality and reliability of these methods varies greatly depending on what is to be measured and the quality of the available data. Criticism of CBAs tendency to undervalue (or entirely ignore) either benefits or costs simply because they are not readily quantifiable has led to the increased use of qualitative measures in CBA through what is known as multiple accounts analysis. Alternatively, the "intangible" (i.e. not measured or not measurable in dollars) costs and benefits are identified and the analysis is left at that.

The cost-benefit analysis is very sensitive to the assumptions used. In this study, we attempt to use prudent assumptions. In other words, given a set of reasonable assumptions, we choose to use the ones that yield the highest costs and the lowest benefits. This helps guard against the "advocacy analysis" trap in which costs are underestimated and benefits exaggerated.

It should be noted that we are measuring the costs and benefits for one year of the College's operation. The net benefits calculated in this study are based on 2002 numbers. They re-occur every year the College operates.

3 Economic Impact Assessment — Yukon Impacts

This chapter estimates the direct and indirect impacts of Yukon College expenditures on Yukon economic aggregates. Induced impacts — those created by College employees spending their pay in the territory — are not estimated in the major part of the analysis (see Section 3.3 below for a more detailed discussion of induced impacts).

3.1 Direct impacts

Direct impacts stem from Yukon College's spending, but do not take into account the effect of the College's spending on other industries. Thus, neither the effect of Yukon Colleges purchases on other economic sectors (indirect impacts), nor the impact of College employee spending their income (induced impacts) is accounted for in this section. The following table presents a summary of the direct economic impacts of Yukon College:

Table 4: Yukon College direct impacts

Total injection (spending)	$21.9 million
Direct Value Added by College	14.2 million
Imports	3.0 million
Exports	0.2 million
Labour Income	14.8 million
Tax revenues generated	2.6 million
Employment (full-time)	151 persons
Employment (part-time)	495 persons
Total Person Years	216.1 PY

3.1.1 Spending and GDP

Total Yukon College expenditure was $21.9 million[4] in 2002. This is the amount the College injected in the Yukon economy. The largest portion of that amount ($14.8 million) was for wages and salaries.

There are three basic approaches to measuring the Gross Domestic Product (GDP) of an economy: expenditures, income, and value added. The expenditure approach sums the amounts of personal consumption, government current spending on goods and services, business and government gross capital formation, and exports, and subtracts imports from that amount. The income approach adds up wages and salaries, income from unincorporated businesses, corporation profits, amortisation or depreciation and indirect taxes. Finally, the value added approach sums the value added generated by each industry in the economy, where value added is the difference between revenue and purchases from other firms or industries. Any one of these methods, in theory, should add up to the same amount, and any one could be used to measure the contribution of Yukon College to the Yukon's GDP.

There are a number of ways of measuring the direct contribution of an enterprise to the economy's GDP. The simplest method is the value-added approach. Total Yukon College

[4] College financial statements show $21.7 million in expenditures. Amortization ($517,000) needs to be excluded and capital expenditures ($210,000) and YTG expenditures on utilities (approximately $500,000) included to come to the final injection figure of $21.9 million.

revenue was $20.7 million in 2002. College purchases amounted to $6.5 million, so total direct value added to the Yukon economy because of the college was $14.2 million. More than half ($3.5 million) of the $6.5 million in purchases was spent in the Yukon. The purchases in the Yukon resulted in an additional indirect impact.

The College represents between 1.5 and 1.8 per cent of the Yukon's $1.2 billion GDP. Comparing it to value added for other industries in 2001, the college is larger than the oil and gas industry in terms of value-added to the Yukon economy, and about the same size as utilities (electricity generation and water & sewer services) and hospitals.[5]

3.1.2 Employment and labour income

The largest portion of the College's expenses was for wages, salaries and benefits, amounting to $14.8 million in 2002. Yukon College had 151 full-time employees and another 40 permanent or term employees who worked at least half-time. In addition, the College had 341 casual employee hires and 166 contract hires. Overall, about 640 people worked for Yukon College in 2002.[6]

Table 5: Number of employees and person-years of employment, 2001-02

Employee type	*Number of employees*	*Person-years*
Full time	151	151.0
Part-time (term or permanent)	40	25.9
Casual employees	} 455	27.6
Contract		11.7
Total	646	216.1

The 191 term or permanent employees at Yukon College represent about 1.3% of the Yukon's labour force. However, if all people who worked for Yukon College are counted, about 4.3% of the Yukon's labour forced worked for the College at some point in 2002.

3.1.3 Taxes

The College's contribution to taxes includes income taxes paid by employees and net Goods and Services Tax remitted.

Based on an average income tax rate of 17.5 per cent[7], Yukon College employees paid about $2.6 million in income taxes, of which $1.7 million went to the federal government and the remaining $900,000 to the Yukon government. These are the direct impacts only and do not take into account indirect or induced tax revenues.

GST is payable on sales by the cafeteria and bookstore. Total cafeteria sales amounted to $217,000 and bookstore sales were $476,000 generating about $49,000 in GST revenues to the federal government. However, the cost of goods sold was about $400,000, resulting in about $29,000 in GST in-out credits. Net GST paid by Yukon College to the federal government was about $21,000.

[5] From Yukon Bureau of Statistics, GDP by Industry, 2001, Information Sheet no. 65.08-02-03.
[6] This number eliminates double counting individuals who were hired on more than one contract or casual position.
[7] CCRA, *1999 Taxation Statistics on Individuals*, showed total income of $621.8 million, federal income taxes of $73.0 million and territorial income tax of $35.9 million (available from http://www.ccra-adrc.gc.ca/tax/individuals/stats/gb99/pst/locsts/lsdown_by_prov-e.html)

3.1.4 Imports and Exports

In 2002, the College imported about $3,000,000 worth of goods and services from Outside the Yukon. Just under 40% of the imports came from Ontario and another 40% from British Columbia. Of the remaining 20%, 10% was imported from foreign countries and the rest distributed among the other provinces and territories.

The largest import is for insurance services (employee benefits), followed by books and other printed matter, payments to other educational institutions, and computer software.

The college also exports educational services, mainly through its English as a Second Language (ESL) program. The ESL program generated about $234,000 in fees from mostly foreign students.

3.2 Indirect Impacts

Indirect impacts are the effect that Yukon College spending has on the industries from which it purchases goods and services. By purchasing goods and services, the College not only increases revenues, but presumably also increases employment in those industries.

One part of the examination of indirect impacts required a detailed invoice analysis. All of the College's spending in 2002 was examined and each supplier of goods or services was assigned to its industry category and identified as either a Yukon or Outside firm. This allows spending to be broken out by industry (see Section 3.2.2 below).

The second part of the analysis of indirect impacts was done by using the multiplier provided by Statistics Canada's inter-provincial input-output model (see Sections 3.2.1 and 3.4 below).

3.2.1 Inter-provincial input-output model

Statistics Canada's inter-provincial input-output model is a detailed mathematical model of the economy that traces the spending of an industry or industry group through the economy for a given period. The multipliers produced in the model show the impact of a given amount of direct spending by an industry group through the cumulative effect of that spending.

The multipliers produced by the I-O model must be treated with some care, as they are the product of a detailed snapshot of the economy at a single point in time. If the structure or size of the economy changes significantly, the multipliers lose accuracy. Another caution is that the model is static, i.e., it cannot account for any reactive behaviour by people, firms, or governments in response to an economic injection. And some reaction, large or small, is inevitable to an economic injection or other event. A final point on the 1999 I-O model is that it is an "open model" that no longer attempts to calculate induced impacts (see Section 3.3 below).

Statistics Canada's 1999 Inter-provincial Input-Output model calculates a multiplier for the combined direct and indirect impacts of spending by the Government Community College industry on the Yukon's GDP. The multiplier takes into account the economic leakages from the territory caused by both the College's imports and the imports purchased by the College's Yukon suppliers. (See Section 3.4 below for the total combined impacts).

The 1999 I-O model also provides a multiplier to calculate the direct and indirect employment impacts of spending by the College. (Again, see Section 3.4 below for the total combined impacts).

3.2.2 Spending by industry

The following table presents the industries from which Yukon College made major purchases in 2002. The table was estimated by coding the industry from which each purchase was made. The industry from which the most purchases was made is "Educational services" which includes goods and services bought from other Colleges and Universities as well as from non-profit and for-profit educational and heritage institutions. Spending on the insurance industry is mainly for employee benefits. A large amount of money was spent, mainly in the Yukon, on Electronics stores to purchase computers. The purchase of books, both for the bookstore and library is another major expenditure.

Table 6: Yukon College purchases by industry

Industry	*Yukon*	*Outside*	*Total*
Educational Services	142,629	655,786	798,415
Insurance Carriers and Related Activities	93,262	641,053	734,315
Electronics and Appliance Stores	702,224	30,955	733,179
Publishing Industries	133,542	571,373	704,915
Professional, Scientific and Technical Services	231,641	230,078	461,719
Religious, Grant-Making, Civic, and Professional and Similar Organizations	318,659	83,936	402,595
Aboriginal Public Administration	372,590	395	372,985
Provincial and Territorial Public Administration	288,704	5,066	293,770
Broadcasting and Telecommunications	220,583	0	220,583
Food, Beverage and Tobacco Wholesaler-Distributors	141,307	44,915	186,222
Credit Intermediation and Related Activities	5,200	179,902	185,102
Information Services and Data Processing Services	78,285	87,744	166,029
Miscellaneous Store Retailers	145,354	8,047	153,401
Securities, Commodity Contracts, and Other Financial Investment		146,006	146,006

3.3 Induced Impacts

Discussion with Statistics Canada and review of the latest inter-provincial input-output model (1999) indicates that Statistics Canada no longer calculates induced impacts. Induced impacts are economic impacts generated by the spending of income recipients, i.e. College employees spending their income, and thereby generating additional economic activity.

Without the induced impacts as a product there is no need to run the College spending through the input-output model, as the indirect impacts are captured more accurately by the invoice analysis presented above than the model could.

Statistics Canada no longer calculates induced impacts because it is believed that they have been abused in the past. The perceived multiplier abuse arises from a common and strong tendency to intuitively over-estimate induced impacts, sometimes from a mistaken impression of the size of economic leakage from an economy and sometimes from the desire to see the economic impact of an institution or project be as large as possible.

The problems with using multipliers to calculate induced impacts are well illustrated by the multipliers used in the Local Area Impact Model to calculate community impacts. Informetrica

Limited calculated the income multipliers for small communities (see Section 4.1.2) but appear somewhat off when applied to Yukon communities.

We are faced with the dilemma of how — or indeed whether — to estimate an impact recognized as very real but for which all the tools available are inadequate at best. An alternative means of estimating induced impacts would be to attempt to calculate fresh multipliers, but that is a major task far beyond the scope of this project.

Following the overall principle to not make this project an "advocacy analysis" that inflates impacts, we are not including induced impacts in the calculation of the overall economic impact of the College.

3.4 Total Yukon Impacts: Direct & Indirect

Table 7 below summarizes the total direct and indirect impacts of Yukon College on the Yukon using multipliers from Statistics Canada's 1999 Inter-provincial Input-Output model.

Table 7: Summary of Yukon College impacts: direct & indirect

		Yukon economy		*Canadian economy*	
	Direct impact ($millions)	*Multiplier (per $1 million spending)*	*Direct & indirect impact ($millions)*	*Multiplier (per $1 million spending)*	*Direct & indirect impact ($millions)*
Spending/Output	$21.9	1.13	$24.8	1.31	$28.7
Employment (Person-Years)	216	11.19	245	13.13	288
Value added (GDP)	$21.9	0.84	$18.4	0.94	$20.6
Imports	$3.0	n/a		0.06	$1.2
Exports	$0.2	n/a		n/a	
Labour income	$14.8	0.62	$13.6	0.68	$14.9
Tax revenue	$2.6	n/a		n/a	

Note: n/a means that no multiplier is available.

Total direct and indirect impacts are calculated by multiplying the College's total spending ($21.9m) by first the Yukon multiplier for the total impact on the Yukon's economy and then the Canadian multiplier for the Canadian impact. Note that the Spending/Output impacts do not subtract leakages such as imports or savings and therefore the total impact is larger than the direct impact.

The total Yukon employment impact of 245 person-years consists of 216 person-years of direct employment (see Table 4 above) and 29 person-years of indirect employment. Interestingly, Yukon College appears to support a further 43 person-years of employment in other parts of Canada.

The Value added (GDP) multiplier is less than one because of economic leakages such as imports, savings, and taxes. The economic leakage caused by imports is especially important in the Yukon's economy. Direct and indirect impact on the Yukon's GDP totals $18.4 million.

There is no multiplier available for the indirect impact of Yukon imports. The Canadian import multiplier represents imports from other countries.

The multipliers for labour income (which are applied to total College spending, not spending on wages and salaries) produce a very odd result; total direct and indirect labour income impacts are smaller than the direct impact (i.e. the actual wages and salaries paid). The direct impact figure is known to be correct as it is taken from the College's financial statements. And for labour income there is no leakage issue as there is for GDP impacts. There are two possible explanations for the result: either the data used for the multiplier is too old (1999) to be accurate today, or Yukon College spends relatively more on wages and salaries than other colleges.

4 Economic Impact Assessment — Community Impacts

Economic impacts on small communities are notoriously difficult to measure accurately. Small populations mean that shifts in the background level of economic activity or employment within the community can substantially alter the impacts being measured. Many of the Yukon's small communities, for example, can show dramatic increases in employment when a school or similar construction project is underway. In this case the employment impact of the college would appear to be considerably smaller than it would normally be.

4.1 Local Area Impact Model

Informetrica Limited of Ottawa developed the local area impact model used in this study for the Ontario Arts Council in 1997. It has been used in various forms for different applications since, including analysing the expected impact of an Alaska Highway pipeline on Whitehorse and Haines Junction. Informetrica Limited has released their model into the public domain, allowing its use for this project.

4.1.1 Data requirements

The data requirements for the local area impact model (LAIM) on this project are as follows:

Income:
- Total declared personal income for local area. (Calculated using CCRA income tax data on total declared personal income from all sources plus self-employment deductions for capital cost allowances if available).

Expenditures:
- Total property taxes collected by the municipality (where applicable).
- Total wages and salaries paid by the College in the community
- Other College spending in the community (not incl. wages and salaries, taxes, insurance costs, depreciation and amortization).

Employment:
- Weekly local wages and salaries per full time equivalent job
- Number of paid hours of employment by College.
    - Including consultant/contract employment

Population and Tourists:
- Number of visitors (attributable to the College) and their average daily expenditure.
- Local population.

Data used in the LAIM comes from the latest available (1999) Canada Customs and Revenue Agency data on incomes in each community. More recent income tax data by community is not yet available from the Canada Customs and Revenue Agency and this data is essential for the model to work with a reasonable level of accuracy. Where possible, the 1999 data has been checked against the less detailed data available from the 2001 Census to look for any major changes. Data on earnings from the 2001 Census is used to calculate local average weekly earnings. The detailed tourism data is also the most recent available (from the 1999 Visitor Exit Survey).

The data summaries for each community's LAIM are located in Appendix A: Local Area Impact Model Data Summary.

A problem in impact measure in small communities is the lack the data required to determine the size of the local economy, i.e., its Gross Domestic Product or GDP. The only component of GDP

for which separate data exists for each of the Yukon's communities is personal incomes through tax data supplied by the Canada Customs and Revenue Agency. (We have no data on other GDP components such as exports, imports, non-municipal government spending, etc.). We are therefore using a community's total declared personal income as a proxy for GDP in estimating the impact of the College on the community's local economy.

The model calls for the wages and salaries paid by the college in the community to be net of all taxes, benefits and other dues. This reflects the reality that the local impact of wages and salaries involves "cash-in-hand" in communities rather than gross pay. Unfortunately, the College accounts supplied for this study do not allow the complete netting of pay. The labour expenditure figures used in the LAIM are net of pension and health benefits, payroll taxes, severance pay (on the assumption that the recipient is likely leaving the community), and expenditures labelled "other." Still included, however, are income tax remittances. The local area impacts of labour expenditures are therefore likely slightly lower than shown in this chapter.

4.1.2 Model strengths and weaknesses

The local area impact model — like all economic models — has its strengths and weaknesses. The model's major strengths are that it is simple and it has been designed for use in smaller communities by a highly reputable national economic research firm. The model's major weaknesses are the possible problems in the Yukon context with the income multipliers used to estimate total impacts, and the means used to estimate impacts on local property taxes.

Multipliers

Small communities tend to suffer from large economic leakages as money that flows into the community flows quickly out again. There are fewer choices for spending and many necessary goods and services (e.g. new vehicles, insurance) are simply not available locally. These large economic leakages lead to very small income multipliers i.e., there are very small induced impacts through money circulating within the community.

The Local Area Impact Model sets the income multiplier for calculating total impacts according to the community's population. These numbers were not plucked out of the air but emerged from analysis of the average level of business diversity across many Canadian communities. Unfortunately for the smaller Yukon communities, all communities with populations less than 2,500 are assigned the same multiplier. Dawson City has a much larger and more diverse business base than Beaver Creek, for example, but they are assigned the same income multiplier (1.04) in the model.

The income multiplier for Whitehorse, on the other hand (1.28), appears rather large in the Yukon context. As a point of comparison, the Yukon's GDP multiplier for educational service industries in Statistics Canada's 1990 Input-Output tables is 1.043.

Local property taxes:

In estimating impact on local property taxes, the model relies on a direct linkage between employment and taxes collected. While there is such a link, it is likely that it is much weaker and less direct in small Yukon municipalities than in the Outside communities for which the model was originally developed. Small Yukon municipalities tend to rely heavily on grants in lieu of taxes from senior levels of government (especially YTG) and so property taxes are less dependent on local employment than the model assumes. Because of this weakness, we have included the model's tax impact results under each applicable community for interest, but have not included them in the summary of impacts.

4.2 Summary of Community Impacts

Table 8 below summarizes the total local income and employment impacts for the 13 Yukon communities in which the College has a presence.

Contribution to local income is the percentage of the community's total declared personal income in 1999 that is attributable to the College's direct labour expenditures and their induced impacts.

Contribution to local employment is the percentage of the community's total employment in 2001 estimated from 2001 Census data (expressed in person-years).

Table 8: Yukon College community impacts: local income & employment

	Contribution to local income		**Contribution to local employment**	
Community	Dollars	Per cent of local income	Person-years	Per cent of employment
Beaver Creek	8,300	0.4%	0.3	0.8%
Carcross	134,000	2.5	4.3	8.0
Carmacks	196,900	2.8	5.9	5.0
Dawson City	373,600	1.0	5.7	1.0
Faro	145,100	2.2	3.0	2.7
Haines Junction	119,300	0.8	2.5	1.2
Mayo	113,700	1.4	2.5	2.0
Old Crow	139,900	3.3	3.0	3.3
Pelly Crossing	205,900	4.5	4.1	3.9
Ross River	100,800	2.3	1.9	2.1
Teslin	195,300	2.7	3.9	4.7
Watson Lake	284,800	1.0	6.1	1.7
Whitehorse	16,990,260	3.2	373.4	3.9

Because of issues with the data and the model (see Sections 4.1.1 and 4.1.2), some care must be taken in interpreting the results shown in the table. The Whitehorse employment results appear particularly suspect given the Yukon total direct and indirect employment impact from the Statistics Canada's 1999 Input-Output model is only 243 person-years of employment.

4.3 Beaver Creek

Table 9 below shows Yukon College's impact on the total local income of Beaver Creek while Table 10 shows the institution's impact on employment.

Table 9: Yukon College impact on local income: Beaver Creek

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	3,039	1.04	3,161
Non-labour expenditure	3,896	1.04	4,052
Visitor expenditure	1,000	1.04	1,040
Gross contribution to local income			**$8,252**

Note: A total of 25 visitor-days in Beaver Creek have been attributed to the College, largely due to the local summer archaeology program.

Yukon College has a minimal presence in Beaver Creek and therefore a minimal impact on the economy. The College is responsible for approximately 0.4% of Beaver Creek's 1999 total local income of $2,063,000.

Table 10: Yukon College impact on employment: Beaver Creek

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	3,039	0.030	0.09
Non-labour expenditure	3,896	0.040	0.16
Visitor expenditure	1,000	0.040	0.04
Gross employment contribution to local economy (person-years)			**0.29**

The College's employment impact is approximately 0.8% of the estimated 36 person-years of employment in the community based on the 2001 Census.

4.4 Carcross

Table 11 below shows Yukon College's impact on the total local income of Carcross while Table 12 shows the institution's impact on local employment.

Table 11: Yukon College impact on local income: Carcross

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	65,322	1.04	67,945
Non-labour expenditure	63,167	1.04	65,694
Visitor expenditure	410	1.04	426
Gross contribution to local income			**$134,065**

Note: A total of 10 visitor-days in Carcross annually have been attributed to the College.

Yukon College accounts for approximately 2.5% of Carcross' 1999 total local income of $5,295,000.

Table 12: Yukon College impact on employment: Carcross

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	65,322	0.026	1.73
Non-labour expenditure	63,167	0.040	2.53
Visitor expenditure	410	0.040	0.02
Gross employment contribution to local economy (person-years)			**4.28**

The College's employment impact is approximately 7.9% of the estimated 54 person-years of employment in the community based on the 2001 Census.

4.5 Carmacks

Table 13 below shows Yukon College's impact on the total local income of Carmacks while Table 14 shows the institution's impact on local employment.

Table 13: Yukon College impact on local income: Carmacks

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	108,604	1.04	112,948
Non-labour expenditure	80,426	1.04	83,643
Visitor expenditure	310	1.04	322
Gross contribution to local income			**$196,913**

Note: A total of 10 visitor-days in Carmacks annually have been attributed to the College.

Yukon College accounts for approximately 2.8% of Carmacks' 1999 total local income of $6,937,000.

Table 14: Yukon College impact on employment: Carmacks

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	108,604	0.022	2.35
Non-labour expenditure	80,426	0.043	3.49
Visitor expenditure	310	0.043	0.01
Gross employment contribution to local economy (person-years)			**5.85**

The College's employment impact is approximately 5.0% of the estimated 117.5 person-years of employment in the community based on the 2001 Census.

Table 15 shows Yukon College's impact on Carmacks' property taxes.

Table 15: Yukon College impact on property taxes: Carmacks

Property tax per FTE job	1,652
Employment contribution	5.8
Impact on property taxes	**$9,568**

The College's impact on municipal property taxes is approximately 5% of the total collected.

4.6 Dawson City

Table 16 below shows Yukon College's impact on the total local income of Dawson City while Table 17 shows the institution's impact on local employment.

Table 16: Yukon College impact on local income: Dawson City

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	284,583	1.04	295,966
Non-labour expenditure	73,756	1.04	76,706
Visitor expenditure	850	1.04	884
Gross contribution to local income			**$373,557**

Note: A total of 10 visitor-days in Dawson City annually have been attributed to the College.

Yukon College accounts for approximately 1.1% of Dawson City's 1999 total local income of $35,095,000

Table 17: Yukon College impact on employment: Dawson City

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	284,583	0.010	2.80
Non-labour expenditure	73,756	0.038	2.81
Visitor expenditure	850	0.038	0.03
Gross employment contribution to local economy (person-years)			**5.65**

The College's employment impact is approximately 1.0% of the estimated 557.5 person-years of employment in the community based on the 2001 Census.

Table 18 shows Yukon College's impact on Dawson City's property taxes.

Table 18: Yukon College impact on property taxes: Dawson City

Property tax per FTE job	$2,527
Employment contribution	5.65
Impact on property taxes	**$14,278**

The College's impact on municipal property taxes is approximately 1% of the total collected.

4.7 Faro

Table 19 below shows Yukon College's impact on the total local income of Faro while Table 20 shows the institution's impact on local employment.

Table 19: Yukon College impact on local income: Faro

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	110,201	1.04	114,609

Non-labour expenditure	29,043	1.04	30,205
Visitor expenditure	313	1.04	336
Gross contribution to local income			**$145,139**

Note: A total of 10 visitor-days in Faro annually have been attributed to the College.

Yukon College accounts for approximately 2.2% of Faro's 1999 total local income of $6,637,000

Table 20: Yukon College impact on employment: Faro

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	110,201	0.016	1.80
Non-labour expenditure	29,043	0.042	1.23
Visitor expenditure	313	0.042	0.01
Gross employment contribution to local economy (person-years)			**3.04**

The College's employment impact is approximately 2.7% of the estimated 112.5 person-years of employment in the community based on the 2001 Census.

Table 21 shows Yukon College's impact on Faro's property taxes.

Table 21: Yukon College impact on property taxes: Faro

Property tax per FTE job	$5,514
Employment contribution	3.04
Impact on property taxes	**$16,763**

The College's impact on municipal property taxes is approximately 2.8% of the total collected.

4.8 Haines Junction

Table 22 below shows Yukon College's impact on the total local income of Haines Junction while Table 23 shows the institution's impact on local employment.

Table 22: Yukon College impact on local income: Haines Junction

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	90,406	1.04	94,022
Non-labour expenditure	23,859	1.04	24,813
Visitor expenditure	400	1.04	416
Gross contribution to local income			**$119,251**

Note: A total of 10 visitor-days in Haines Junction annually have been attributed to the College.

Yukon College accounts for approximately 0.8% of Haines Junction's 1999 total local income of $14,458,000.

Table 23: Yukon College impact on employment: Haines Junction

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	90,406	0.017	1.54
Non-labour expenditure	23,859	0.037	0.89
Visitor expenditure	400	0.037	0.01
Gross employment contribution to local economy (person-years)			**2.45**

The College's employment impact is approximately 1.2% of the estimated 212.5 person-years of employment in the community based on the 2001 Census.

Table 24 shows Yukon College's impact on Haines Junction's property taxes.

Table 24: Yukon College impact on property taxes: Haines Junction

Property tax per FTE job	$1,905
Employment contribution	2.45
Impact on property taxes	**$4,667**

The College's impact on municipal property taxes is approximately 1.2% of the total collected.

4.9 Mayo

Table 25 below shows Yukon College's impact on the total local income of Mayo while Table 26 shows the institution's impact on local employment.

Table 25: Yukon College impact on local income: Mayo

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	94,451	1.04	98,229
Non-labour expenditure	13,784	1.04	14,335
Visitor expenditure	1,060	1.04	1,102
Gross contribution to local income			**$113,667**

Note: A total of 10 visitor-days in Mayo annually have been attributed to the College.

Yukon College accounts for approximately 1.4% of Mayo's 1999 total local income of $8,278,000.

Table 26: Yukon College impact on employment: Mayo

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	94,451	0.020	1.87
Non-labour expenditure	13,784	0.039	0.53
Visitor expenditure	1,060	0.039	0.04
Gross employment contribution to local economy (person-years)			**2.45**

The College's employment impact is approximately 2.0% of the estimated 125 person-years of employment in the community based on the 2001 Census.

Table 27 shows Yukon College's impact on Mayo's property taxes.

Table 27: Yukon College impact on property taxes: Mayo

Property tax per FTE job	$1,550
Employment contribution	2.45
Impact on property taxes	**$3,798**

The College's impact on municipal property taxes is approximately 2% of the total collected.

4.10 Old Crow

Table 28 below shows Yukon College's impact on the total local income of Old Crow while Table 29 shows the institution's impact on local employment.

Table 28: Yukon College impact on local income: Old Crow

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	91,569	1.04	95,232
Non-labour expenditure	42,910	1.04	44,626
Visitor expenditure	0	1.04	0
Gross contribution to local income			**$139,858**

Note: Zero visitor-days in Old Crow have been attributed to the College because we have no data on visitor spending in Old Crow (the 1999 Visitor Exit Survey shows 100% of visitors to the North Yukon travelled to the area by motor vehicle).

Yukon College accounts for approximately 3.3% of Old Crow's 1999 total local income of $4,193,000.

Table 29: Yukon College impact on employment: Old Crow

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	91,569	0.017	1.53
Non-labour expenditure	42,910	0.035	1.51
Visitor expenditure	0		0
Gross employment contribution to local economy (person-years)			**3.04**

The College's employment impact is approximately 3.3% of the estimated 92.5 person-years of employment in the community based on the 2001 Census.

4.11 Pelly Crossing

Table 30 below shows Yukon College's impact on the total local income of Pelly Crossing while Table 31 shows the institution's impact on local employment.

Table 30: Yukon College impact on local income: Pelly Crossing

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	146,184	1.04	152,031
Non-labour expenditure	51,449	1.04	53,507
Visitor expenditure	313	1.04	326
Gross contribution to local income			**$205,864**

Note: A total of 10 visitor-days in Pelly Crossing annually have been attributed to the College.

Yukon College accounts for approximately 4.5% of Pelly Crossing's 1999 total local income of $4,562,000.

Table 31: Yukon College impact on employment: Pelly Crossing

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	146,184	0.014	2.11
Non-labour expenditure	51,449	0.038	1.96
Visitor expenditure	313	0.038	0.01
Gross employment contribution to local economy (person-years)			**4.08**

The College's employment impact is approximately 3.9% of the estimated 105 person-years of employment in the community based on the 2001 Census.

4.12 Ross River

Table 32 below shows Yukon College's impact on the total local income of Ross River while Table 33 shows the institution's impact on local employment.

Table 32: Yukon College impact on local income: Ross River

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	82,634	1.04	85,939
Non-labour expenditure	13,965	1.04	14,524
Visitor expenditure	313	1.04	326
Gross contribution to local income			**$100,789**

Note: A total of 10 visitor-days in Ross River annually have been attributed to the College.

Yukon College accounts for approximately 2.3% of Ross River's 1999 total local income of $4,306,000.

Table 33: Yukon College impact on employment: Ross River

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	82,634	0.015	1.23
Non-labour expenditure	13,965	0.046	0.64
Visitor expenditure	313	0.046	0.01
Gross employment contribution to local economy (person-years)			**1.88**

The College's employment impact is approximately 2.1% of the estimated 90 person-years of employment in the community based on the 2001 Census.

4.13 Teslin

Table 34 below shows Yukon College's impact on the total local income of Teslin while Table 35 shows the institution's impact on local employment.

Table 34: Yukon College impact on local income: Teslin

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	130,855	1.04	136,089
Non-labour expenditure	56,707	1.04	58,975
Visitor expenditure	220	1.04	229
Gross contribution to local income			**$195,293**

Note: A total of 10 visitor-days in Teslin annually have been attributed to the College.

Yukon College accounts for approximately 2.7% of Teslin's 1999 total local income of $7,254,000.

Table 35: Yukon College impact on employment: Teslin

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	130,855	0.012	1.61
Non-labour expenditure	56,707	0.040	2.27
Visitor expenditure	220	0.040	0.01
Gross employment contribution to local economy (person-years)			**3.89**

The College's employment impact is approximately 4.7% of the estimated 83 person-years of employment in the community based on the 2001 Census.

Table 36 shows Yukon College's impact on Teslin's property taxes.

Table 36: Yukon College impact on property taxes: Teslin

Property tax per FTE job	$2,064
Employment contribution	3.89
Impact on property taxes	**$8,029**

The College's impact on municipal property taxes is approximately 4.7% of the total collected.

4.14 Watson Lake

Table 37 below shows Yukon College's impact on the total local income of Watson Lake while Table 38 shows the institution's impact on local employment.

Table 37: Yukon College impact on local income: Watson Lake

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	191,503	1.04	199,163
Non-labour expenditure	81,768	1.04	85,039
Visitor expenditure	570	1.04	593
Gross contribution to local income			**$284,795**

Note: A total of 10 visitor-days in Watson Lake annually have been attributed to the College.

Yukon College accounts for approximately 1.0% of Watson Lake's 1999 total local income of $28,881,000.

Table 38: Yukon College impact on employment: Watson Lake

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	191,503	0.013	2.56
Non-labour expenditure	81,768	0.042	3.47
Visitor expenditure	570	0.042	0.02
Gross employment contribution to local economy (person-years)			**6.06**

The College's employment impact is approximately 1.7% of the estimated 360 person-years of employment in the community based on the 2001 Census.

Table 39 shows Yukon College's impact on Watson Lake's property taxes.

Table 39: Yukon College impact on property taxes: Watson Lake

Property tax per FTE job	$2,853
Employment contribution	6.06
Impact on property taxes	**$17,289**

The College's impact on municipal property taxes is approximately 1.7% of the total collected.

4.15 Whitehorse

Table 40 below shows Yukon College's impact on the total local income of Whitehorse while Table 41 shows the institution's impact on local employment.

Table 40: Yukon College impact on local income: Whitehorse

	Direct & indirect effects ($)	Income multiplier	Direct, indirect, & induced effects ($)
Labour expenditure	10,318,939	1.28	13,208,242
Non-labour expenditure	2,949,102	1.28	3,774,851
Visitor expenditure	5,600	1.28	7,168
Gross contribution to local income			**$16,990,260**

Note: Because Whitehorse is considerably larger than other Yukon communities, it has a larger income multiplier.
Note: A total of 100 visitor-days in Whitehorse annually have been attributed to the College.

Yukon College accounts for approximately 3.2% of Whitehorse's 1999 total local income of $534,290,000.

Table 41: Yukon College impact on employment: Whitehorse

	Direct & indirect effects ($)	Local employment coefficient	Direct, indirect, & induced effects (person-years)
Labour expenditure	10,318,939	0.025	260.65
Non-labour expenditure	2,949,102	0.038	112.51
Visitor expenditure	5,600	0.038	0.21
Gross employment contribution to local economy (person-years)			**373.4**

The College's employment impact is approximately 3.9% of the estimated 9,595 person-years of employment in the community based on the 2001 Census.

Table 42 shows Yukon College's impact on Whitehorse's property taxes.

Table 42: Yukon College impact on property taxes: Whitehorse

Property tax per FTE job	$1,678
Employment contribution	373.4
Impact on property taxes	**$626,565**

The College's impact on municipal property taxes is approximately 3.9% of the total collected.

5 Cost-Benefit Analysis

This chapter examines the costs and benefits for the College operations in the year 2002. The costs are all incurred in that year, but many of the benefits of post-secondary education usually continue for the working life of the students. This means that future benefits must be included in the analysis. On the principle that a bird in the hand is worth more than two in the bush, however, future benefits must be discounted.

Discounting future benefits reflects a fundamental fact of human nature — we have a strong tendency to value things in the present more than we value potential benefits in the uncertain future. This is intuitively obvious when a straightforward choice is available. If people were offered $1,000 now or $1,000 five years from now, it would be very difficult to find anyone who would opt for the future payment. The reasons are obvious; the promise of future payment may not be kept, I may be dead in five years, and $1,000 invested now will be worth more than $1,000 in five years.

Discounting future benefits is done using a discount rate — a percentage figure that can be thought of as a negative interest rate. The choice of the discount rate can have very large effects on the present value of a stream of future benefits such as the expected higher lifetime earnings of students. The higher the rate chosen, the smaller the total present value of the stream of income as future years' income gains quickly become insignificant. Because of its importance, the choice of what figure to use as a discount rate has always been contentious in cost-benefit analysis. The choice is further complicated by the widely accepted belief that private discount rates (i.e., what an individual would use) are normally considerably higher than the social discount rate (based on the assumption that societal decisions should be based on a longer view and value benefits to e.g. future generations more highly).

Note that the real return long-term bond yield rate is used as the discount rate here because no inflationary income gains are assumed. This avoids having to make arbitrary assumptions about inflation. A real return bond ensures Government of Canada bond yields are typically used in this type of analysis because they represent risk-free interest rates and are presumed to be a reasonable measure of the social discount rate.

Rates of return are an alternative to present value calculations, and provide an indication of how much an investment is worth while avoiding potential controversy over discount rates. The internal rate of return is the effective percentage annual return on an investment. The computations of present value and rates of return are mathematically similar. In present value calculations, the discount rate is fixed and the value of future benefits is calculated, while in internal rates of return, the net present value of benefits is fixed to zero and the required discount rate is calculated.

Cost-benefit analysis is intended to consider externalities. An externality is a cost borne or benefit gained by someone who is not a party to the transaction. They are often referred to as unintended consequences. There can be "positive externalities", which are benefits and "negative externalities", which are costs. In the case of the College, the parties to the transactions concerned are Yukon College, students and others who purchase services from the College. Impacts on others, such as governments and society in general, are externalities.

5.1 Costs

In a CBA, costs represent the use of societal resources. In theory, the money or resources could be expended on alternative uses. Thus, costs are measured in terms of opportunity cost, or the cost of the next best alternative. This is not always the same as accounting costs presented in financial statements. In cost benefit analysis, costs include all private and social costs, including negative externalities. The costs of educating students at Yukon College consist of: direct cash costs, the opportunity costs incurred by students, and one negative externality — increased Employment Insurance costs. There are also the costs to the municipality of providing sewer and water, fire protection etc., but we have chosen not to include them in the analysis[8].

5.1.1 Direct Cash Costs

The following table presents the annual cost of operating Yukon College (operating and capital) obtained from the College's financial statements. Note that amortization or depreciation is not included, as it does not represent a current use of societal resources. However, capital costs are included, as they could have had alternative uses. In addition, the Yukon government pays most utility costs for the College, as the entire Yukon Place (Ayamdigut campus, Archives, Arts Centre) are on one meter. These are estimated at $500,000 per year and included under utilities in Table 43 below.

Table 43: Direct costs of operating Yukon College

Salaries, wages and benefits	$14,808,724
Contract services	1,438,548
Materials and supplies	1,339,662
Student assistance/scholarships	995,949
Other	1,068,271
Cost of sales and ancillary services	653,923
Travel	538,420
Utilities and communications	747,891
Employee leave and termination benefits	126,200
Capital expenditures	209,626
Total	**$21,927,214**

5.1.1.1 Who pays the direct costs?

The bulk of Yukon College's funding comes from the Yukon government with a $11.4 million grant and an additional $3.0 million in contracts. The federal government is also a major contributor with $1.4 million in contracts to deliver specific programs. Tuition comprises a small proportion of college revenues, only $883,000 or about 4.4% of the total. Tuition paid by Yukon and Canadian students is even lower at 3.2% of revenues.

[8]The municipal costs would be counter-balanced by benefits to municipalities such as the grants in lieu of property taxes by YTG, and by property taxes paid by those staff and students who would not reside in the community without the College. Due to the complexity of this cost-benefit calculation, and the relatively low net effect found by other Colleges (e.g. Augustana University College in Canmore, Alberta found a net municipal benefit of approximately $250,000) we have decided to not include the municipalities in the calculations.

Table 44: Yukon College revenues, 2002

Revenues	
Contributions, Yukon Government	$11,357,468
Yukon government contracts	3,028,000
Federal Government contracts	1,428,000
Student assistance /scholarships	995,949
Sales, rentals and services	855,278
Tuition and registration fees	650,225
Rebates and miscellaneous income	589,743
First Nation & other governments contracts	388,000
Non Profit Groups contracts	352,000
Interest income	319,005
Tuition ESL	233,067
Private sector contracts	13,000
Total	**$20,209,735**

Note: The difference between the total revenues shown in Table 44 and the total direct costs in Table 43 do not indicate a large deficit. The costs include items such as electrical power that do not appear on the College's books

5.1.1.2 Cost of tuition and educational supplies purchased by students

Tuition and educational supplies purchased by students represent another set of direct costs. It appears that the College collected $650,000 in tuition in 2001-02 from Canadian students. Tuition paid by foreign students in the ESL program is accounted for in "Third Party Revenue", and does not represent a cost to Canada or the Yukon. Foreign student tuition is actually a benefit, since it ultimately adds to the resources available to the Canadian/Yukon economy.

A portion of the costs of educational supplies is already included in the direct costs of operating the College. These are the costs of goods sold for the bookstore. However, the bookstore generates a gross profit of $76,000, mainly from student spending. As well, students purchase supplies from other businesses, but that amount is difficult to obtain. It is assumed that students spent about $100,000 for educational supplies. This amount does not materially affect the cost-benefit analysis.

Costs: Social and Private:
The Yukon government pays the majority of the costs of the College through an annual contribution.

The federal government also pays some costs through a smaller contribution.

Students bear direct private costs through the payment of tuition and the purchase of books and supplies.

The largest private cost, however, is the loss of potential income by students as they attend school (opportunity cost).

5.1.2 Opportunity costs

Students attending college, even those doing so purely out of interest, lose the income they otherwise could have earned. Even if they have no intention of working, it is assumed that their leisure time is valued at the hourly wage they could have earned. This assumption that time should be valued at people's wage rates is standard in cost-benefit analysis and in economic theory.

The assumption made for this exercise is that full-time students are losing 80 per cent of the annual income they would have earned, given their educational level. The 80 per cent figure is used because full-time students typically obtain summer jobs at a lower wage rate for an assumed three months.

It is also assumed that part-time students bear the cost of the hourly wage they could have earned had they not take a course. Except for individuals taking Public Health and Safety course, it is assumed that part-time students spent an average of 10 hours per week for 14 weeks each semester on their studies. Public Health and Safety students are assumed to spend 10 hours on their courses on average. We considered using full-time equivalents (FTEs) as a measure of time spent by students in order to be consistent with other college performance measures. But, while, using FTEs is straightforward for full time students, in order to calculate lost income or income gains for part time students we must relate time spent in school to hourly wage rates.

Table 45 below presents these income losses. The numbers have been calculated from 2001 Census data for the Yukon. The Developmental Studies figures were calculated from incomes earned by individuals with less than high-school graduation, while the Graduate programs are based on the average income of university graduates in the Yukon. The average income loss for people taking Public Health and Safety courses is based on the Yukon average employment income. Most other programs offered by Yukon College require a minimum high-school graduation, so the lost income is based on the average income of high-school graduates in the Yukon.

Table 45: Student opportunity cost of lost income assumptions

	Full time students (annual income)	*Part-time students (hourly income)*
Developmental studies	15,412	17.89
Graduate programs (MSW, MPA)	36,786	31.80
Public Health and Safety		24.78
All others	20,602	21.69
Statistics Canada – Cat. No. 97F0019XCB01002		

Table 46 below sums the lost income for the different types of students. Note that income losses by foreign ESL students are excluded from these calculations, as they do not represent an income loss for Canada or the Yukon. Total lost income is $22.3 million dollars, about the same as the direct cost of operating the College.

Table 46: Opportunity cost of lost income by Yukon College students

	Full time Students		***Part-time Students***		***Total***
	Number of students	*Lost Income*	*Number (semester-students)*	*Lost Income*	*Lost Income*
Developmental studies	341	5,255,492	377	944,029	6,199,521
Graduate programs	0	0	22	97,958	97,958
Public Health and Safety	0		1,560	386,577	386,577
All others	381	7,849,514	2,555	7,758,712	15,608,226
Total	722	13,105,006	4,514	9,187,275	22,292,281

5.2 Benefits

Benefits either increase society's resources and productive capacity, or result in freeing up societal resources for other uses. A benefit results in society as a whole having more resources. From this perspective, by increasing people's income, education increases individual, and hence social, productive capacity. At the same time, education also results in reducing some social costs as higher education levels are linked to better overall health (and hence lower health spending) and much lower rates of use of Social Assistance.

Benefits can either be private, and accrue to specific individuals, or social where they accrue to society as a whole or to governments. Higher incomes, personal or business cost savings are examples of private benefits. On the other hand, savings in Employment Insurance, Social Assistance, health care and crime costs are social benefits. It should be noted that private benefits are also social benefits. Anything that improves the well being of an individual without reducing the well-being of others is considered to be an improvement in social well-being.

Benefits are measured by willingness to pay for them. In theory, benefits should be measured by the amount of utility or well-being they generate, but the direct measurement of utility or usefulness has proved intractable. Barring telepathic powers, it is impossible to compare the utility gained by one individual with that gained by another person. Instead, benefits are measured in dollars; more specifically by how much individuals are willing to pay for them. The higher income of people with higher educational attainments indicates that employers are prepared to pay more for educated people. Similarly, in the case of savings, the amount that was spent indicates a willingness to pay.

Note that, in most cases, willingness to pay is more than what is actually paid. The difference between willingness to pay and actual expenditures cost is known as "consumer surplus".

But using dollars can lead to inequities. Rich individuals will be willing to pay more dollars for something than poor people, even though it would obtain the same amount of satisfaction to both. Bearing this in mind, dollars are nevertheless the only unit of account available.

5.2.1 Private benefits

The private benefits of College mostly accrue to students through increased employment income over their lifetimes. In all studies of earnings functions, education is the single largest determinant of income. In addition, employers and other groups who use the college's facilities also benefit. Private benefits include:

- Increased income for students including increased tax revenues & improved economic productivity (*Canada/Yukon*)
- Intrinsic value of taking courses for interest for non-degree taking students (*Canada/Yukon*)
- Value of benefit to employers from having Yukon College provide locally available training (including savings from not having to send employees Outside) (Yukon)

5.2.1.1 Increased employment income for students

Table 47 below presents 2001 Census data on the difference in average income for different education levels. Individuals with less than high school graduation are at the bottom of the income scale. College and trade certificates have about the same effect on income, while a university degree leads to considerably higher incomes.

Table 47: Average Employment Income by Education level: Canada and Yukon, 2000

	Canada	Yukon
Total	$31,757	$31,526
Less than high school graduation certificate	21,230	19,265
High school graduation certificate and/or some post-secondary	25,477	25,753
Trades certificate or diploma	32,743	33,352
College certificate or diploma	32,736	33,817
University certificate, diploma or degree	48,648	45,982

Source: Statistics Canada, 2001 Census, - Cat. No. 97F0019XCB01002

In estimating increases in future income by Yukon College students, it is important to consider that Yukon College caters to a number of different student types, and that income changes will depend on the increase in educational level. Further, higher incomes will normally last for the student's working life.

The Arts and Science Division caters mainly to students intent in obtaining a university degree or in taking courses for interest's sake. So for those students, the income increase is goes from high-school graduates to the University average. However, university programs normally take four years to complete, so only one quarter of the income gain is attributed to one year at the college. For part-time students, the income gain is assumed to be one-fifth of that for full time students on the basis that they take one course per semester.

Developmental studies are aimed at people wanting a GED or High School certification. Thus income increases for those students goes from "Less than high school" to high school graduation. Part-time students are assumed to increase their income by one half of that amount for each semester.

Professional Studies include trades training and programs that result in a certificate or diploma such as office administration and tourism studies. For most professional studies students, income gains should bring them from the high school graduate level to the trade or college certificate/diploma level. As these incomes for these two educational groups are fairly close, the average of the two was used. For part-time students, one-twentieth of the gains of full time students, was used for each semester.

Public Health and Safety students present a particular challenge in estimating income gains. Many of these courses can have an on-off switch effect on the employability of people in certain industries and positions. For example, taking a basic first aid course and a chain-saw safety course can make the difference between being unemployable and getting a well paying job cutting line for a seismic project. In this example, taking the courses is a necessary but not sufficient condition for getting the job — and getting the job means a very large jump in income. On the other hand, it is difficult to argue that a student taking the WHMIS course, for example, will see any income gain as a result. In order to not overestimate impacts, we assume that Public Health and Safety students increase their hourly wage by only $0.25 on average, giving $450.00 per year.

Table 48 below presents these assumptions. Note that the annual gains are turned into lifetime gains using a specified assumption about average number of years of working life after

graduating. Also, the lifetime gains are discounted by the real rate of return on Long Term Government of Canada Bonds (3.12% on May 6, 2003).[9]

Table 48: Income gain assumptions

Full time students (Per year)					
	Total Annual Increase	*One year ratio*	*Annual increase in income from one year of college*	*Average Working life (Years)*	*Present Value of lifetime gains per student*
Arts and Science	$13,841	1/4	$3,460	35	$73,068
Developmental studies	$4,247	1/2	$2,124	35	$44,839
Professional Studies	$5,840	1/2	$2,920	30	$56,357
Part-time students (per course)					
	Total Annual Increase	*One course ratio*	*Annual increase in income from one course*	*Average Working life (Years)*	*Present Value of lifetime gains per student*
Arts and Science	$15,909	1/40	$398	25	$6,834
Developmental studies	$4,247	1/5	$849	35	$17,936
Graduate programs	$10,000	1/10	$1,000	20	$20,000
Professional Studies	$5,840	1/20	$292	30	$5,636
Public Health and Safety	$450	1	$450	25	$7,732

Based on the above assumptions, Table 49 below presents the annual and lifetime present value of the gains from studying at Yukon College for both full-time and part-time students. Note that the increase is assumed to be linear and proportional to the amount of time or number of courses. The number of full-time students is the number of students in the 2002 Academic Year so that they are not double counted. The part time student figure is the sum of the number of students in each semester. It is assumed that part-time students only take one course in each semester.

The total lifetime benefit to students resulting from increased incomes is estimated at close to $70 million. Not surprisingly, as has been found over and over again in numerous studies across the world, the total benefits to students resulting from increased incomes amount to much more than the costs of the College.

[9] Source: Bank of Canada Web Site http://www.bank-banque-canada.ca/en/bonds.htm.

Table 49: Lifetime income gain calculations

	Number of students	*Annual increase in income*	*Lifetime PV of increased income*
Full time Students			
Arts and Sciences (including YNTEP)	143	$494,833	$10,448,716
Developmental studies	341	724,114	15,290,130
Graduate programs (MSW, MPA)			
Professional studies	208	607,375	11,722,267
Public Health and Safety	0		
All others	30		
Total Full time students	722	$1,826,322	$37,461,113
Part-time Students			
Arts and Sciences (including YNTEP)	413	$164,255	$2,822,331
Developmental studies	377	320,224	6,761,735
Graduate programs (MSW, MPA)	22	22,000	440,000
Professional studies	1,744	509,261	9,828,670
Public Health and Safety	1,560	702,000	12,062,177
All others	506	0	0
Total part time students	4,622	$1,717,740	$31,914,913
All Students			
Arts and Sciences (including YNTEP)		$659,088	$13,271,047
Developmental studies		1,044,337	22,051,864
Graduate programs (MSW, MPA)		22,000	440,000
Professional studies		1,116,636	21,550,938
Public Health and Safety		702,000	12,062,177
All others		0	0
Total All students		**$3,544,062**	**$69,376,027**

5.2.1.2 Savings by students remaining in the Yukon

These savings are obtained mainly by students in the first year of an academic discipline and those in trades who would have to go Outside for their schooling if the College did not offer the required courses. According to a 2002 survey of Yukon College students, 23.3% of students lived with their parents. These students would incur greater expenditures were they to go to an Outside institution.[10] Also, 44.2% of students were married or living common-law. Studying Outside would involve either moving there, or if the student's spouse wished to remain in the Yukon, it would involve maintaining two households. The figures in Table 50 represent net savings of resources by students that would have to be used for travel, higher tuition, and from not having to maintain two households while studying Outside. For full-time students in Arts and Sciences, the savings are estimated at $5,000 annually per student on average.

The estimated savings are lower for people studying trades because the time spent in school is considerably lower. For the purposes of this exercise, they are estimated at $3,000 each on average.

[10] R.A. Malatest & Associates Ltd., Yukon College Institutional Report, 2002 Canadian College Student Survey Project, Table F-5.

Table 50: Savings by Students remaining in the Yukon

	Average savings	*Number of Students*	*Total savings*
Academic	$5,000	120	$600,000
Trades	3,000	68	204,000
Total Benefit			$804,000

5.2.1.3 Intrinsic value of taking courses for interest for non-degree taking students

This amount can be assumed to be the tuition plus the value of the time of those taking courses for pleasure. Estimating this benefit would require more detailed student data. Available surveys do not indicate how many students take courses for pleasure or general personal interest rather than being in a program leading to a certificate, diploma or degree.

5.2.1.4 Benefit to employers and others from having Yukon College provide locally available training

From an opportunity cost perspective, use of the College's facilities and staff provide a benefit to employers at least equal to the cost of the courses. Otherwise, there would be no incentive for these organisations to pay for the courses. Without the College, employers would have to either forego the training, presumably resulting in lower employee productivity, or pay a higher amount to send employees Outside, or bring in instructors, which would also cost more. The total amount of benefit is assumed to be equal to the cost, which is the College's revenue from third-party contracts. Total computed benefits are $5.2 million. Note that, from a willingness to pay perspective, actual benefits to employers are higher than this amount. Employers are prepared to pay the $5.2 million, but some would also be prepared to pay more to send their employees Outside or to organize and directly offer the training themselves.

5.2.2 Social Benefits

Social benefits are benefits that accrue to society in general, or in the case of reduced government expenditure, to taxpayers in general. Among the social benefits of higher education are reductions in transfer payments such as Social Assistance and Employment Insurance, and reductions in other social costs such as those associated with health care and crime. Improved health and reduction in crime have been shown to be social benefits resulting from higher education are Both have been shown to be related to educational levels and represent not inconsiderable social costs.

Most social benefits are "externalities", i.e. they benefit others than the students and the College, mainly the general public through reduced government expenditure and allowing government resources to be put to other uses (either providing other goods and services or reducing taxes).

Social benefits include:

- Reduction in transfer payments (EI, SA, etc.);
- Improved health;
- Reduction in crime.

The net overall effect of education reducing on transfer payments is small.

Governments "win" by reducing their direct expenditures on transfers. Individuals "lose" because they no longer get the transfer payment income. However, education-induced income gains result in much higher lifetime earnings for individuals, and increase tax revenues for governments.

5.2.2.1 Transfer Payments

Transfer payments are payments that the government makes to individuals or corporations for which it receives no goods or services. They include Employment Insurance, pensions, and Social Assistance as well as a large number of payments from different programs, including workers' compensation, refundable tax credits (e.g. GST tax credit, Child Tax Benefit), and different forms of income supplements.

The impact of higher education on pensions is not considered in this study, since we are concerned with the effect of 2002 College operations and it is not clear that there are savings. With higher incomes come higher Canada Pension Plan benefits, resulting in higher costs when current students retire.[11] On the other hand, lower Guaranteed Income Supplement payments as well as fewer disability pensions would offset these higher costs. The net effect is difficult to estimate, but likely to be small and negative rather than positive. The effects on pensions are many years down the line. Assuming that those benefits will start occurring 35 years from now, the present value of a one dollar saving in 35 years is only worth $0.34 cents today.

Because of the way the available data is structured, this study considers Employment Insurance separately and lumps all other transfer payments together. The latest available data for the Yukon is from the 1996 Census. The 2001 Census data relating type of income and education has not been released at the time of this writing. Statistics Canada's Survey of Consumer Finances could also provide that information, but the survey is not conducted in the Yukon. Note that 1996 Census income data refers to 1995 income.

By their nature, transfer payments do not have a net impact on overall income.[12] The income of those who receive transfer payments is offset by taxation paid by others. So reducing transfer payments does not affect overall net benefits or costs. However, there are important distributional implications. When transfer payments decline as a result of higher education, there is a reduction in social costs (EI, Social Assistance, etc.). The lower social costs are offset by a reduction in private benefits, since individuals no longer receive the transfer payments in question. Reducing transfer payments through education is important to governments because of the reduced social costs and increased long-term tax revenues. The private losses are more than compensated by the public benefits and increased lifetime earnings by individuals.

5.2.2.2 Effect on Employment Insurance payments

Education leads to lower unemployment. Part of the benefit of lower unemployment is higher employment income. This has been implicitly incorporated in the calculation on the income benefits in Section 5.2.1.1 above. However, an added potential social benefit is the reduction in Employment Insurance paid to people with higher education. The data shows that university graduates collect less EI. Surprisingly, however, *the data shows that individuals with some post-secondary education short of a university degree actually draw more from the Employment Insurance program than those with no post-secondary education at all.*

Why do people with some post-secondary education draw more Employment Insurance? There are at least three possible reasons:

[11] Note that the CPP system is a "pay-as-you-go" system as opposed to a funded pension plan, so today's contributions are used to pay today's pensions. CPP contributions are already included in income gains.
[12] The overall net effect would be close to zero, but there are also some small transaction costs, mainly costs of administering a transfer payment program. By reducing the payments, there may be small savings in administrative costs.

1. Many construction workers and other trades people — who commonly have stretches of seasonal unemployment — have trades certificates, a form of post-secondary education short of a university degree.
2. Low education/income individuals work less and earn lower wages. Hence, fewer of them qualify for EI, and when they do, they tend to draw less.
3. It may be that those who have not graduated from college or university have less attachment to the labour force. This may be related to the discussion in the economic literature that a university degree — like a high school completion certificate — acts as a simple "signal" to employers of the reliability or discipline of potential employees.

EI and Education
People with some post-secondary education use Employment Insurance more than either university graduates or high school graduates. Unlike other transfer payments, use of EI rises with increased education until university graduation is achieved.

The net effect is that post-secondary education at Yukon College increases total EI payments in the Yukon by $54,000 per year.

Calculating the social benefit from Employment Insurance savings is not as straightforward as might be first thought. Table 51 below shows unemployment rates by highest level of schooling. While there seems to be a definite progression, with higher levels of schooling resulting in lower unemployment rates, one anomaly stands out; people with high school graduation have a lower unemployment rate than those with some post-secondary education (without a university degree). Only people with a university degree have lower unemployment rates than those with high school graduation.

In the Yukon, in 2001, only university and high school graduates (without post-secondary education) had lower than average unemployment rates. The same general pattern holds true for Canada, albeit less strikingly. For Canada as a whole, however, people with a college diploma have a lower unemployment rate than high school graduates.

Table 51: Unemployment rates by educational level, Yukon and Canada, 2001

Highest level of schooling	*Yukon Unemployment rate*	*Canada Unemployment rate*
Less than grade 9	32.9	13.1
Grades 9-13	15.1	8.9
Grades 9-13 without high school graduation certificate	19.6	10.8
Grades 9-13 with high school graduation certificate	8.2	6.8
Trades certificate or diploma	12.8	6.8
College	12.3	6.6
Without certificate or diploma	18.6	8.9
With certificate or diploma	10.3	5.9
University without bachelor's degree or higher	10.0	8.0
University with bachelor's degree or higher	3.5	4.6
Total	11.6	7.4

Source: Statistics Canada, 2001 Census, Cat. No. 95F0380XCB01004

Employment Insurance (EI) benefits are not strictly correlated with unemployment rates for a number of reasons, including the fact that only about half of the unemployed are covered, while

EI serves other social purposes such as providing maternity benefits and sick leave pay. Nevertheless, the same pattern holds true. High school graduates collect relatively less Employment Insurance than people with some post-secondary education. Only university graduates use the EI program less than high school graduates.

Table 52 presents the latest available data on Employment Insurance and educational levels for the Yukon. As noted above, data from the 2001 Census is not yet available, while other potentially useful surveys do not include the Yukon. Another problem with the data is that the educational categories are rather grossly defined, with all people with some post-secondary education lumped together. The data does not allow distinguishing those with a post-secondary diploma or certificate from others. More finely graded data from the 1996 is not available except at high cost and the 2001 Census data has not yet been published.

Table 52: Employment Insurance averages and indicators, Yukon, 1995.

	Average EI for recipients	*% with EI income*	*EI as % of income*	*Average EI per person with income*
LT High School	$5,423	16%	4.0%	$868
High school	$4,929	20%	3.9%	$994
Less than university degree	$5,563	21%	3.9%	$1,177
University degree	$4,879	13%	1.4%	$653
Total	$5,452	19%	3.6%	$1,084

Source: Calculated from Statistics Canada, 1996 Census, Dimension Series, "Canadian Income and Earnings for 1995", Catalogue # 94F0005XCB.
Note: People receiving Old Age Security have been excluded from the calculations.

Paralleling unemployment rates, high school graduates receive less EI than people with some post-secondary education. The probability of receiving Employment Insurance (i.e. % of people with EI income in each educational grouping) does not decrease with educational level; it actually increases until university graduation is reached. The relative dependence on EI as a source of income is very similar for the three lowest educational groupings.

The key figure in Table 52 is the average EI per person with income. The difference between one educational level and the next is the potential saving or social benefit from increasing educational levels. However, by increasing educational levels, EI payments are also increased until university graduation is attained. Thus, college education appears to produce a negative externality by increasing Employment Insurance, until students are university graduates.

In addition to the lower unemployment rate of high school graduates shown in Table 51, there are a number of other reasons for this pattern. People with less than high school graduation typically earn lower wages and are more dependent on other types of transfer payments such as Social Assistance than high school graduates. As the amount of Employment Insurance benefits depends on employment income, it is not surprising that people who have not graduated from high school cost less, despite their higher unemployment rates. The higher cost of people with some post-secondary education is a result of the combination of higher unemployment rates and higher incomes. The low unemployment of university graduates as well as the limits on EI benefits result in their costing less on average than the others.

The calculation of costs and benefits from changes in the use of EI is done in a manner similar to that of income gains from post-secondary education in Section 5.2.1.1 above. The assumptions

relating to the number of students, ratios and working life are the same as those presented in Table 48: Income gain assumptions, above. The only group that results in net benefits is students going who eventually complete a university degree. These are assumed to represent 60% of Arts and Science students.

Table 53: Effects of post-secondary education on Employment Insurance

	Number	*Annual reduction (increase) in EI*	*PV of reduced (increased) EI*
Full time students			
Arts and Sciences (including YNTEP)	143	$8,568	$180,916
Developmental studies	341	(21,373)	(451,309)
Professional studies	208	(19,043)	(367,528)
Total Full time students	722	$(31,848)	$(637,921)
Part-time students			
Arts and Sciences (including YNTEP)	413	$2,474	$42,518
Developmental studies	377	(9,452)	(199,582)
Professional studies	1,744	(15,967)	(308,158)
Total part time students	4,622	$(22,944)	$(465,222)
All students			
Arts and Sciences (including YNTEP)		$11,042	$223,434
Developmental studies		(30,825)	(650,891)
Professional studies		(35,010)	(675,686)
Total all students		**$(54,793)**	**$(1,103,143)**

Based on the assumptions outlined above, as well as Census income and unemployment data, post-secondary education's overall effect is to increase the costs of Employment Insurance to the federal government. The amounts are relatively small compared to overall expenditures for EI. However, these are transfer payments that increase the income of students. The social cost to the government is offset by an increase in private benefits, and the net social impact is zero.

5.2.2.3 Reduction in Social Assistance and Other Transfer Income

The relationship between the Social Assistance and other social transfers and education level, like Employment Insurance, is somewhat complicated. Table 54 presents Yukon data on "Other Government Transfer" income. These figures are from the 1996 Census (1995 income), the latest available at the time of writing. Social assistance makes up the largest portion of the "Other Transfer Income data, but it also includes, according to Statistics Canada:

> This source [Other government transfers] includes social assistance payments received by persons in need, such as mothers with dependent children, persons temporarily or permanently unable to work, elderly individuals, the blind and the disabled. Included are provincial income supplement payments to the elderly and provincial payments to the elderly to help offset accommodation costs. Also included are other transfer payments such as payments received from training programs sponsored by the federal and provincial governments, TAGS payments for employees in the fishing industry, regular payments from provincial automobile insurance plans, veterans' pensions, war veterans' allowance, pensions to widows and dependants of veterans, and workers' compensation.

> Additionally, any amounts received in 1995 for refundable provincial tax credits and the federal goods and services tax credits are included.[13]

Table 54 shows that, generally, as education level goes up, the probability of depending on government transfer income declines. Note that people receiving Old Age security have been excluded from the numbers presented in Table 54. About 63 per cent of Yukon people with less than high school depended to some extent on "Other Government Transfers", accounting for 4.4% of their income. For Yukon university graduates, 32% per cent received some form of "Other Government Transfer", and it accounted for only about one-half of one per cent of their income.

Yukon high school graduates appear to be an anomaly. As with Employment Insurance, they seem less dependent on government transfers than people with some post-secondary education. The equivalent numbers for Canada show a similar pattern. Note that the educational categories are rather grossly defined, with all people having some post-secondary education lumped together. The data does not allow distinguishing those with a post-secondary diploma or certificate from others.

Table 54: Other Government Tranfers, Yukon. 1995

Educational level	*Total Other government transfers income*	*% of total population*	*Other government transfers per person*	*Probability of receiving other government transfers*	*% of total individual income*
Less than High School	$4,758,000	24%	$958.31	63%	4.4%
High school graduation	$803,000	9%	$425.99	44%	1.7%
Less than university degree	$8,240,000	52%	$754.58	54%	2.5%
University degree	$761,000	16%	$228.87	32%	0.5%
Total	$14,562,000	100%	$694.94	52%	2.3%

Source: Statistics Canada, 1996 Census, Dimension Series, "Canadian Income and Earnings for 1995", Catalogue # 94F0005XCB.

Data on the composition of this "Other government transfers" has not proved possible to obtain. Data on government spending on transfers to persons in 1995 is widely inconsistent with the $14.6 million individual Yukoners reported on their 1996 Census forms. Statistics Canada showed that other transfers to persons amounted to $30 million in 1995 as shown in Table 55. Note that this $30 million does not include Social Assistance paid by First Nation governments. In the statistical data, those are subsumed under "Grants to Aboriginal persons and organizations", which amounted to $44 million in 1995.

[13] Statistics Canada, *1996 Census Dictionary - Final edition*, Catalogue #92-351-UIE, p.36.

Table 55: Federal and Territorial Transfers to persons, millions of dollars, 1995 and 2000.

	1995	*2000*
Child tax benefit or credit	6	7
Goods and Services Tax credit	2	2
Miscellaneous federal transfers	2	10
Social assistance, income maintenance	7	9
Social assistance, other	5	5
Workers' compensation benefits	8	4
Total "Other" transfers to persons	30	37
Total territorial	45	49
Total federal	87	142
Total government transfer payments to persons	142	205

Source: Statistics Canada, CANSIM, Table 384-0009

There is some evidence that use of Social Assistance is related to education. There is no data available on the incidence of Social Assistance by education level; i.e. what proportion of the population in each educational group is on Social Assistance. This data would be required to separately estimate the effect of education on Social Assistance. The National Council on Welfare examined the limited available 1997 data from a number of provincial governments.[14] About 11% of welfare cases examined had post-secondary education, compared to 13% of cases with primary education and 59% with secondary education. No information on educational attainment was available for the remaining 17%. Given that 51% of the population had post-secondary qualifications in 1996[15], it is clear that the people with post-secondary education use less Social Assistance. The question that cannot be answered with any reliability at this stage is by how much.

Other types of transfer payments increase with income, although they may be subject to thresholds. This is true of the GST tax credit and workers' compensation. The overall effect of increasing education on total "Other Transfers" is that they drop with high school graduation, then rise with some post-secondary education and then drop once more for university graduates. The overall impact of the College on "Other Transfers" is a net positive benefit to governments by reducing overall transfers by $76,000 per year. Over students' working life, this is worth about $1.7 million in present value terms. However, like EI, except conversely, the benefits to governments are offset by a reduction in transfer payment income by individuals, so the net effect is again zero. Public benefits are offset by private losses.

[14] National Council on Welfare, Profiles of Welfare: Myths and Realities Spring 1998, http://www.ncwcnbes.net/htmdocument/reportprowelfare/ProfilesWelfare.htm#_Toc535823819
[15] Calculated from Statistics Canada, "Population 15 years and over by highest level of schooling, 1981-2001 Censuses", http://www.statcan.ca/english/Pgdb/educ45.htm.

Table 56: Effects of post-secondary education on "Other" Government Transfers to Persons

	Number	*Annual reduction (increase) in Other Transfers*	*PV of reduced (increased) Other Transfers*
Full time Students			
Arts and Sciences (including YNTEP)	143	$6,528	$137,845
Developmental studies	341	90,759	1,916,445
Professional studies	208	(34,173)	(659,529)
Total Full time students	722	$63,115	$1,394,760
Part-time Students			
Arts and Sciences (including YNTEP)	413	$1,885	$32,396
Developmental studies	377	40,136	847,507
Professional studies	1,744	(28,653)	(552,990)
Total part time students	4,622	$13,369	$326,913
All students			
Arts and Sciences (including YNTEP)		$8,413	$170,240
Developmental studies		130,896	2,763,952
Professional studies		(62,825)	(1,212,520)
Total all students		$76,484	$1,721,673

5.2.2.4 Improved health

Health is clearly associated with income and education levels. As Statistics Canada points out:

> Health can be influenced by income and education. People with higher incomes can generally expect to live longer and healthier lives than those earning less. In 1996–97, only 47% of Canadians at the lowest income level rated their health as very good or excellent, compared with 73% in the highest income group. … Only 19% of people who had not graduated from high school said their health was excellent, whereas more than 30% of university graduates claimed they enjoyed excellent health.[16]

However, the direction of causation is not clear. Better education and higher incomes may lead to better health, but the converse may also be true. Healthier people may be in a better position to obtain more education and better paying jobs. A portion of the health benefits of education is captured in the higher incomes estimated in Section 5.2.1.1 above on higher lifetime incomes for students. Things like lower absenteeism and reduced health-related unemployment presumably result in healthier people earning higher income.

However, better health results in greater economic productivity and lower use of societal resources. Better health presumably results in lower health care expenditure. Governments in Canada cover about 70 per cent of health care expenditures, mainly by the provincial or territorial level, except for Status Indians. That percentage is higher in the Yukon: 84.4% of health care costs were covered by the public sector. Health care spending was $4,568 per person in the Yukon in 2002, with governments accounting for $3,855 of that. The Yukon government paid for

[16] Statistics Canada, *Canada E-book*, Catalogue No. 11-404-XIE, available at http://142.206.72.67/02/02b/02b_007g_e.htm.

$3,352 of the total. Per capita expenditures on health care were higher in the Yukon than in any Canadian province and were only surpassed by the other two territories.

Table 57: Per capita Health Care Spending, Yukon, 2000

Source of Funds	*$ per person*	*Per cent of spending*
Federal Government	$503	11.0%
Yukon Government	$3,352	73.4%
Total Government	$3,855	84.4%
Private	$713	15.6%
Total	$4,568	100.0%

Source: Canadian Institute for Health Information, http://secure.cihi.ca/

There are a large number of indicators of health, and masses of data on specific health conditions and behaviours. Improving health should result in lower overall health care costs. Data do show that more highly educated people use some health services, especially preventative services, more than those with less schooling, but more prevention is expected to reduce overall costs. On the other hand, less educated people are more stressed, are more often overweight, smoke more, are sick more often, tend to drink less often but more heavily, and tend to suffer slightly more from chronic conditions. Appendix D presents more detailed information on a number of health indicators and education levels.

The CCBenefits study done for Alberta community colleges used only three health indicators: smoking, alcohol abuse and absenteeism. However, the effects of higher education on health are much broader. Among the important health effects ignored by the CCBenefits study are: reduced stress, a lower proportion of overweight people and all the attendant benefits resulting from weight loss, and greater use of preventative health care measures. Also, people with post-secondary education have generally healthier lifestyles, and not only with respects to alcohol and tobacco use. Finally, we would argue that the effects of absenteeism are already captured in the higher incomes earned by people with post-secondary education, so this is not an additional benefit.

There are also are added “synergies” or cumulative impacts of education on health through increasing social status:

> Again and again, population health researchers have shown the importance of income and social status. Even when people have all the basics such as adequate food and shelter, the higher their income and social status, the better people’s health. A pioneering study in the field, the Whitehall Study, followed the health of more than 10,000 British civil servants for nearly 20 years. It showed that health and life expectancy improved at each level in the ranks of the civil service, even though all the people studied had adequate incomes, and all worked in "low risk" office jobs. Even when the study looked at "high risk" health behaviours such as smoking, researchers found that top people who smoked were much less likely to die of smoking-related causes.[17]

[17] National Council on Welfare, *The Cost of Poverty*, Winter 2001-02, http://www.ncwcnbes.net/htmdocument/reportcostpoverty/Costpoverty.html.

The large number of indicators presented in Appendix D could lead to an extremely complicated and cumbersome analysis of benefits. Despite the large number of potential indicators, researchers have found that self-assessed health status is a very good indicator of overall health and highly correlated with other measurements of health.

> Self-rated health status is a good predictor of the presence of more "objectively" measured health problems, as well as health care utilization and longevity. Self-rated health status summarizes physical and mental health as experienced by the individual according to the individual's values and, in the format usually found in population surveys, permits some assessment of positive health as more than just the absence of health problems. [18]

Self-rated health status data for all education categories is not easily available, and would require a special run on Statistics Canada's National Population Health Survey. However, data for the end points (less than high school and university degree) is available and interpolating the values in between is justified. Table 58 below presents the relationship between health status and income. The clear conclusion is that the higher the income, the better the health status. For the lowest income group, 21% have either fair or poor health, compared to only 5% of the highest income group. Similarly, 47% of the low-income group have excellent or very good health, while this is true of 73% of the highest income group.

Table 58: Self-rated health status and income, Canada

	Excellent	*Very good*	*Good*	*Fair*	*Poor*	*Total*
Lowest income	19	28	32	16	5	100
Lower middle income	18	32	32	14	5	100
Middle income	22	39	29	8	2	100
Upper middle income	26	41	26	6	1	100
Highest income	33	40	22	4	1	100
Income not stated	27	37	27	8	3	100
Total Population	25	38	27	7	2	100

Source: Statistics Canada, Statistical Report on the Health of Canadians, Cat. #82-570-XIE, P.219

As education level is a good predictor of income, there is a close correlation between education and health. This is confirmed by two quotes we have gleaned from the literature.[19] Both are based on data stemming from the National Population Health Survey. Briefly, for university graduates, 30 per cent stated they were in "Excellent" health and 72 per cent stated they were either in "Excellent" or "Very good" health. For people with less than high school education, 19% stated they were in "Excellent" health and 49% stated they were either in "Excellent" or "Very good" health. Table 59 presents the data and the interpolations, as well as the assumptions used in calculating the health benefits of education. For purposes of estimating health benefits, health care for people with less than high school is estimated to cost 123% of the population average while university graduates cost 84% of the average. The last column was selected for the estimations, as it will yield lower benefits in accordance with the principle of using the most prudent and defensible estimate.

[18] Health Canada, Statistics Canada, & Canadian Institute for Health Information, *Statistical Report on the Health of Canadians 1999*, Prepared by the Federal, Provincial and Territorial Advisory Committee on Population Health, p. 217.
[19] See the quote on p. 40 and Statistics Canada, National Population Health Survey Overview, 1994-95, Cat. #82-567, p. 8.

Table 59: Percentage health care cost distribution assumptions

	Self-rated health status		*% of average per capita health expenditure*	
	Excellent health	*Excellent or Very good health*	*Excellent health*	*Excellent or Very good health*
Less than high school	19.0	49.0	129%	123%
High school	21.8	54.8	113%	111%
Some post-secondary	24.5	60.5	100%	100%
Trade or college certificate/diploma	27.3	66.3	90%	91%
University	30.0	72.0	82%	84%
Average	24.5	60.5	100%	100%

The percentages in the rightmost column of Table 59 are applied to the per capita health care costs presented in Table 57 on page 41. The difference in health care costs between one education level and the next are the assumed benefits per person. Then the same assumptions and analysis are used as in Section 5.2.1.1 above to calculate income benefits. Table 60 presents the results of these calculations.

Table 60: Health care benefits of Yukon College

	Number	*Annual reduction in Health Care costs*	*PV of lifetime reduced Health Care costs*
Full time Students			
Arts and Sciences (including YNTEP)	143	$32,732	$691,162
Developmental studies	341	100,994	2,132,544
Professional studies	208	80,642	1,556,373
Total Full time students	722	$214,367	$4,380,079
Part-time Students			
Arts and Sciences (including YNTEP)	413	$9,453	$162,434
Developmental studies	377	44,662	943,072
Professional studies	1,744	67,615	1,304,959
Total part time students	4,622	$121,731	$2,410,466
Full time Students			
Arts and Sciences (including YNTEP)	413	$42,186	$853,596
Developmental studies		145,656	3,075,616
Professional studies		148,257	2,861,333
Total all students		**$336,098**	**$6,790,545**

Overall, Table 60 shows Yukon College results in savings of close to $7 million to the health care system. Most of these saving will accrue to governments, as higher income people tend to spend more on private health care. One assumption needs to be highlighted. In calculating the present value of benefits, the number of years used is the remaining years in working life to retirement. However, health care costs continue, and actually increase, in post-retirement years. If remaining life expectancy (e.g. to 80 years old) were to be used, benefits would increase to $8.6 million. But both of these figures rely on the implicit assumption used in the present value calculations that

health care expenditures are constant throughout an individual's life which is known not to be true on average (expenditures are heavily skewed to the last years of life).

In order to account for both health benefits lasting till death and the skewing of health care expenditures to the later years of life, the present value calculations were redone using the average annual reduction in health care costs and remaining life expectancy of students, but setting expenditures to zero for the first 15 years following College attendance. This calculation results in total health care savings of $4.3 million in present value terms. Given the prudent assumptions approach used throughout this analysis, we are choosing to use the $4.3 million figure as representing the improved health benefit of Yukon College.

5.2.2.5 Reduction in costs related to crime

Crime rates and their associated costs (victim costs, incarceration, criminal justice system, etc.) can be reduced through higher education. This is particularly important in the US context where crime rate and incarceration rates are much higher. US-based economic studies of higher education place a substantial emphasis on these benefits. However, the recent study done by CCBenefits for Alberta showed a benefit of only about $700,000 from reduced crime for $800 million in spending on community colleges.

Scaling it back to the Yukon implies that annual benefits here would be less than $20,000. That amount over 20 years would yield a present value of $294,000. A 20-year time horizon is used rather than the 25 to 35 years in other calculation because crime and incarceration rates decline with age.

5.2.3 Other positive externalities

5.2.3.1 Value to community of use of College facilities

Many community groups use College facilities for different types of functions. The amount the college rents those facilities for is a good estimate of the value of these facilities to the community, as there are a number of other competing facilities in Whitehorse. Total gross rental income by the College was $41,000.

5.2.3.2 Savings by Federal Government for Aboriginal students

The federal government provides financial assistance to many Aboriginal students attending post-secondary educational institutions. The assistance program is available to status Indians and Inuit students and helps cover tuition, books, transportation and living costs. Total assistance was approximately $298 million across Canada in the 2003/2003 fiscal year. The existence of Yukon College provides the positive externality of reducing federal government expenditures in this program.

The data required to do a detailed calculation of this benefit are lacking but a reasonable estimate can be made by using tuition costs as a proxy. First Nation students make up approximately 30% of the student body at Yukon College and are assumed to pay 30% of the tuition, or $195,000. Not all that tuition is for academic courses but we are assuming it is for this calculation.

The College's basic tuition cost per academic course is $150 versus a cost of $345 per course at UBC. If all the First Nation students at Yukon College were attending UBC and were all eligible for assistance, the federal government would be paying approximately $250,000 more in assistance.

Obviously not all First Nation students are taking academic courses, not all are necessarily eligible for federal assistance, and not all would necessarily be attending an Outside institution if Yukon College did not exist. But we have not included savings for travel and living assistance Outside, which would likely be substantial. Therefore the estimate of an annual savings to the federal government of $250,000 appears reasonable.

5.2.3.3 Exports

Spending done in the Yukon by individuals or entities residing Outside add to the resources available to the Yukon economy. Similarly for Canada, spending by foreigners also increases Canada's command over goods and services. So, for the Canadian level of analysis, tuition fees and living costs of foreign students represent a benefit, as do tuition fees and living costs of Outside students.

However, computing these amounts is difficult, and the available data would lead to questionable results. Some information is available from the *2002 Canadian College Student Survey*.[20] That survey interviewed 235 students out of an estimated population of 1583. Close to 90 percent of students cam from the Yukon, 9.8% came from other parts of Canada and 0.9% were from other countries. The study did ask students how much they spent on different items. However, the results were presented in categories, making it difficult to compute total spending in dollars. Further, the study did not distinguish spending between Outside and Yukon students because the sample of Outside students was too small (about 20). In addition, the amount earned in the Yukon by these students would have to be subtracted from the spending to show the net increase in resources. Without more detailed information on foreign and Outside students, it is not possible to compute spending by Outside and foreign students in the Yukon.

For the purposes of this cost-benefit analysis, only ESL student tuition is considered an export. This amounted to $233,000 in 2002.

5.2.3.4 Intangibles: positive externalities not measured

There are a number of positive externalities that provide benefits to the Yukon or to individuals but for which there are no data to make quantitative estimates. These intangibles include:

- Community impacts and other synergies
- Provision of cheap part-time labour by students without a corresponding impact on social service agencies (benefiting both the Yukon and Canada),
- Stimulation of research and development activities in the Yukon, and,
- Improved & more educated labour force making the territory more attractive to investors.

The benefit of a trained workforce to employers — or potential employers —is particularly relevant to the mining and oil & gas industries in the Yukon who often require workers for a variety of jobs on a seasonal and/or irregular basis. Many of these jobs — line cutting for example — do not require extensive qualifications but having people with First Aid tickets and Public Health and Safety courses in the communities can be a boon to an employer.

[20] R.A. Malatest & Associates Ltd., *Yukon College Institutional Report, 2002 Canadian College Student Survey Project*.

The overall effect is a benefit to the Yukon through making the territory more attractive to Outside investors.

5.3 Canada level cost-benefit analysis

The following table summarizes the results of the cost-benefit analysis. The total private and social costs of educating students at Yukon College are about $48 million, offset by about $83 million in current and future benefits. Based on the assumptions outlined above, this results in a net benefit of at least $35.3 million.

Table 61: Summary of Costs and benefits – Canada level

Costs	
Direct College Operating Costs	$21,927,214
Cost of tuition and educational supplies purchased by students	726,225
Opportunity Cost of students' time	22,292,281
Increased Employment Insurance cost to government	1,103,143
Reduced Transfer Payments income by individuals	1,721,673
Total Costs	$47,770,536
Benefits	
Increased income for students	$69,376,027
Savings by students remaining in the Yukon	804,000
Intrinsic value of taking courses for interest for non-degree taking students	Not Available
Value of locally available training	5,209,000
Improved health	4,283,128
Reduction in transfer payments costs to governments	1,721,673
Increased EI income by individuals	1,103,143
Value to community of use of College facilities	41,000
Exports	233,067
Crime reduction	294,275
Other positive externalities – not measured	Not Available
Total Benefits	$83,065,312
Net benefit (Net cost)	**$35,294,777**

5.3.1 Overall social rate of return

Calculating a social rate of return involves treating the initial costs as an investment, and comparing it with the stream of future net benefits. The rates of return calculated in this exercise are “Internal Rates of Return”, which are the interest (or discount) rates required to bring the present value down to zero.

These calculations were done on exactly the same assumptions as the present value calculations. Income and other benefits (Social Assistance Employment Insurance, health care and crime cost savings) were assumed to continue for the periods outlined above. However, the benefits were not assumed to start in the first year, but instead were staggered. Income from university education

(Arts & Science students) was assumed to start three years after the initial expenditure, while income from other programs (Professional Studies, Developmental studies, etc.) was assumed to begin two years after the expenditure.

Based on these assumptions and the calculations described above, the overall social rate of return on Yukon College costs (including opportunity costs) is 8.5% per year. So, investing in a Yukon College education is like an investment that returns 8.5% for society as a whole. This percentage compares favourably with calculations done by the OECD, which estimated the overall social rate of return on post-secondary education at 6.8% for Canadian men and 7.9% for Canadian women.[21] Note, however, that the differences in methodology could account for the difference in rates of return, so the higher Yukon rate of return may not be significant. Nevertheless, the fact that our calculations are similar to those provided by an international organization provides some measure of comfort in their validity.

Different actors or sectors of society (e.g., students or governments) will have different rates of return, depending on which costs they bear and which of the benefits they can claim.

5.3.2 Private rate of return for students

The rate of return to Yukon College students is estimated at 14.2% per year. This is based on the costs borne by students (tuition, books and supplies, and opportunity cost of lost wages, as well as reductions in transfer payment income). Only the benefits accruing to students are considered: increased lifetime income, living cost savings by attending college locally, and a reduction in the 30% of health care costs borne by private individuals. Comparing it to OECD estimates of 13.6% for men and 12.7% for women[22], as in the overall social rate of return, Yukon College is again slightly higher.

5.3.3 Returns to Government/taxpayer finances

Given the different fiscal arrangements and transfers among the federal, territorial and First Nation governments, it is difficult to disentangle who pays for what between the three levels of government and which government benefits. Costs to governments are relatively straightforward: they represent how much governments contribute to Yukon College's finances in a given year. Table 44: Yukon College revenues, 2002 presents amounts paid directly by governments to Yukon College. Adding the contributions of the Territorial, federal and First Nation governments yields a total cost to governments of $16,200,000. One proviso applies to federal government expenditures. In the past, Human Resources Development Canada provided a form of block funding to the College by purchasing a "block" of "seats" in certain course. This was changed in the mid 1990s. Now, the federal government pays the tuition only for the actual number of people taking the courses. However, the Yukon government provides additional funding to the College to compensate for this loss. The Yukon government's funding comes from a Labour Market Development Agreement with the federal government. In addition, tuition costs for Status Indian students are often paid by the federal government.

Benefits to governments/taxpayers include increased tax revenues as a result of higher incomes of students and reduced social charges such as Social Assistance, health care, Employment

[21] OECD, *Education at a Glance: OECD Indicators 2002,* Table A13.4. Social rates of return to education (1999-2000).
[22] OECD, *Education at a Glance: OECD Indicators 2002,* Table A13.3. Private internal rates of return to education (1999-2000).

Insurance[23], and crime. The federal government obtains an additional benefit for Status Indian Students who pay lower tuition fees at Yukon College. Keeping with the principle of only making prudent assumptions, the lowest marginal tax rate was used to calculate increased tax revenues (16% for federal income tax and 7.04% for territorial income tax). Note that increased incomes will put many students in higher tax brackets, so the calculated tax revenues is an underestimate. As well, increased contributions to EI and Canada Pension Plan were not included.

There is an overall 4.8% return per year to all governments' finances in all jurisdictions – including provincial governments. Canadian taxpayers not only get their money back, but actually get a positive return on their investment from higher education at Yukon College. If we consider only the Yukon (i.e. exclude potential benefits to provincial governments from students who move out of the Yukon), the rate of return ranges from 2.9% if all College students leave the Yukon, to 3.9% if half of Yukon College students make their career in the Yukon.

The government of Canada is the largest "winner" from Yukon College education. Counting costs borne directly by the federal government and increases in EI, as well as future federal income tax revenue, the rate of return to federal government expenditures on Yukon College is 25.7% per year.

Fiscal relations between the Yukon and federal governments complicate the analysis of costs and benefits to governments. It could be argued that much of the Yukon government expenditures are ultimately paid for by the federal government, since the federal government contributes about 70% of the Yukon government's revenues, mostly through the formula funding agreement.

On the other hand, the formula funding transfer agreement suffers from what has been termed the "perversity factor" by Tony Penikett, a former Yukon Premier. Under that agreement, increases in Yukon government income tax revenues from higher incomes (rather than tax rate increases) result in an equivalent reduced federal transfer to the Yukon Government. In the past, the Yukon government lost up to $1.45 in federal transfers for every $1.00 increase in tax revenues. Currently, the "perversity factor" is about $1.00 to $1.00. So any increase in tax revenues for the Yukon government is offset by an equivalent reduction in federal transfers. This applies not only to increased incomes from education, but also to any economic development initiative that raises Yukoners' incomes.

Taking into account Federal transfers to the Yukon government (i.e. assuming that the federal government pays for 70% of the Yukon government's contribution), the rate of return to the federal government is still 5.8%, assuming that 50% of Yukon College students remain in the Yukon.

Adding First Nation governments further complicates matter. Before land claims agreements were signed, Status Indians working on reserve or settlement land did not pay taxes for work done "on Reserve". The Yukon land claims and self government agreements completely changed the fiscal relations. Not only do Status Indians now pay taxes, but First Nation governments collect income taxes paid by individuals who live on Settlement Land. First Nation governments will benefit from increased incomes from students living on Settlement Land. Furthermore, First Nations with self government agreements have entered into a number of fiscal transfer agreements mainly with the federal government, where they take responsibility for a number of

[23] Note that the cost of Employment Insurance actually goes up with college education as was pointed out above. This increase in cost is taken into consideration in the rate of return calculations for governments and for the federal government calculations.

social programs including education, health and social assistance. So, it becomes extremely difficult to assign savings from reduced social charges to the appropriate level of government.

Examining the return to sub-federal governments (i.e. territorial and First Nation levels) in the Yukon, the rate of return to Yukon governments if all students remain in the Yukon is 1.2% per year. The break-even point – zero rate of return – occurs if about half of all students remain in the Yukon.

5.4 Yukon level cost-benefit analysis

For the Yukon, there are a number of differences. In looking at the costs and benefits for the Yukon, the costs are those costs that are paid for using resources located in the Yukon. So, tuition fees and living costs paid by Outside residents are not costs to the Yukon. Similarly, benefits include benefits that remain in the Yukon or add resources to the Yukon economy. The most important issue here is determining how much of the large income gain experienced by students remains in the Yukon. This is a function of how many students stay in the Yukon and contribute to the Yukon economy after completing their studies.

Federal government spending also poses a challenge. On one hand, the Yukon is an integral part of Canada, and pays taxes and receives benefits from the federal government. From that perspective, federal spending in the Yukon is a Yukon cost. On the other hand, some federal spending would not occur if Yukon College did not exist. So those expenses should be treated as additional resources available in the Yukon coming from Outside, hence an export.

5.4.1 Costs

Some of the costs of operating the College are not borne by Yukon residents or entities. For example, the opportunity cost of time by non-residents should not be included in costs. However, the lack of information on non-resident students does not allow the estimation of this amount.

In addition, the $1.4 million direct Federal government spending on the College also represents an injection into the Yukon economy, rather than a cost since this amount would most likely be spent elsewhere in Canada.[24] Yukon level costs are estimated at $43,518,000, which represent all costs except for federal government spending.

5.4.2 Differences in Benefits

5.4.2.1 Federal spending

On the benefit side, the $1.4 million in federal spending on the College should be considered a benefit to the Yukon rather than a cost. The existence of the College leverages federal funds that would otherwise go to educational institutions Outside the Yukon.

Other federal spending on post-secondary education is now funnelled through the Yukon Government. In the past, block funding amounts coming from Unemployment Insurance were paid directly to the College by the old Canada Employment and Immigration Department (now HRDC). Now, presumably, the Yukon government could spend it anywhere, so it no longer represents a federal expenditure.

[24] Yukoners' share of that expenditure would be about $14,000 as the Yukon constitutes about 0.1% of the Canadian economy and tax receipts.

Also, in the past, the Federal government provided funding for post-secondary education to provincial and territorial governments through "Established Programs Financing (EPF)". This disappeared in the 1990s to be replaced by the Canada Health and Social Transfer, which imposes much fewer controls on provincial/territorial spending.

The analysis has shown that higher education results in more spending on Employment Insurance, which is a federal program. However, this is a transfer and has no net impact on the difference between costs and benefits. It could be argued that this represents and injection into the Yukon, but it must be recognized that that injection should be reduced by the amount of EI premiums paid by Yukon employees and employers. The program is designed to be self-financing, so there would be no net impact.

5.4.2.2 Proportion of students remaining in the Yukon

The computation of how much of students' future income can be attributed to the Yukon is problematic. Yukon College students who do not reside and work in the Yukon after graduation considerably reduce the future income benefit to the Yukon. As well, students leaving the Yukon affect social spending on transfer payments and health.

There is no data on what proportion of Yukon College students stay in the Yukon, so a single figure for net benefits to the Yukon cannot be calculated. However, a series of figures can be calculated for different proportions of students remaining in the territory. Table 62 presents the Yukon level present value of benefits based on different proportions of students remaining in the Yukon for their career. The rate of return calculation uses these benefits and the $43,518,000 present value of Yukon level costs. Break-even for the Yukon requires that about 25% of Yukon College students stay. Looking at it from a present value perspective, close to 50% of students must remain to match the 3.12% social discount rate used in the analysis, so that the present value of benefits equal the costs.

Table 62: Total Social Benefits and Internal Rate of Return by Percentage of Students Remaining in the Yukon, Yukon Level

% of students remaining in the Yukon	*Present Value of Social benefits*[25]	*Internal Rate of Return*
10%	$20,520,000	-2.9%
15%	$23,650,000	-1.8%
20%	$26,780,000	-0.8%
25%	$29,900,000	0.1%
30%	$33,030,000	1.0%
40%	$39,280,000	2.5%
50%	$45,530,000	3.8%
60%	$51,790,000	5.0%
70%	$58,040,000	6.2%
80%	$64,290,000	7.3%
90%	$70,550,000	8.3%
100%	$76,800,000	9.3%

[25] The bulk of this figure is increased income. The 100% figure differs from the $83 million presented in Table 61 because only Yukon level social transfers are included.

5.4.2.3 Impact on Yukon governments

The analysis can only examine costs and benefits to all sub-federal governments in the Yukon (territorial, municipal & First Nation) since the data does not allow distinguishing to which level of government certain savings accrue, e.g. reduced Social Assistance and health care costs. Total costs to governments in the Yukon amounted to $14.8 million, while the present value of benefits, discounted at 3.12% per annum amounted to $11.2 million assuming that all students remain in the Yukon. Benefits to Yukon governments include income tax revenues on additional income and reduced social assistance payments and 70% of the reduction in health care costs. As with the analysis of federal government costs and benefits, the lowest territorial marginal income tax rate was used (7.04%). Looking at it from a rate of return perspective, Yukon governments break even (i.e. a 0% rate of return) if about 50% of students remain in the Yukon for their career. The rate of return to Yukon governments if all students remain in the Yukon is 1.2% per year.

A different approach could be taken by looking at what proportion of students need to remain in the Yukon to offset the costs to the Yukon government though overall social benefits. Looking at the annual costs of the College to the Yukon government ($14.4 million), these represent 21% of the $69.4 million student income benefits. In other words, if one student out of five remains in the Yukon, the private benefits of their lifetime income gains exceed the cost to the Yukon government. Alternatively, we can ignore full time students and only examine the benefits from part-time students. The value of the lifetime income gains to part time-students amounted to $31.9 million. Thus, if only half of the part-time students and none of the full-time students remain in the Yukon, the private benefits would still exceed the cost to the Yukon government.

It should be noted that the costs of post-secondary education in the Yukon are offset by the much larger gains the Yukon makes by "importing" highly educated individuals from other provinces. The Yukon has the most highly educated population of any provincial or territorial jurisdiction in Canada, and most of these people were not educated in the Yukon. In effect, the Yukon, along with the "have" provinces such as Alberta and Ontario, is indirectly subsidised by the education expenses of other provincial governments.

5.4.2.4 Exports

As discussed above, expenditures by non-resident Canadians for tuition and living expenses should be considered a benefit for the Yukon. About 9.8% of College students are Canadians from other provinces and territories. Their expenditures offset the costs incurred to educate them. However, available data did not allow estimating the total benefit.

5.5 Differential impacts on First Nations

One of the goals of the Yukon College economic impact assessment is to estimate differential impacts on First Nations. The College does impact both First Nation governments and First Nation individuals. However, estimating the benefits and costs to First Nation individuals and governments poses a serious challenge.

The signing of land claims and self-government agreements with a number of Yukon First Nations has completely altered fiscal relation and responsibilities of Aboriginal governments. Self-governing First Nations now receive a portion of the federal and territorial income taxes (75% and 95% respectively) paid by people living on settlement land and many have negotiated fiscal transfer agreements and taken over responsibility for some social programs such as education, health care and social assistance. With these new fiscal arrangements, income increases and reduction in social charges, and therefore post-secondary education, directly affect First Nation governments' fiscal situations. Data on self-governing First Nation tax receipts, or on

Social Assistance payments by FN governments is not available. Without this data detailed costs and benefits cannot be calculated for First Nation governments.

First Nation individuals likely benefit from a college education at least to the same extent as non-aboriginals. A lack of specific data, however, makes it very difficult to quantify costs and benefits to First Nation individuals . The 2001 Census data on aboriginal income, education, and employment will not be released until January 2004. Aboriginal data on income and education from the previous 1996 Census is unreliable as many First Nations boycotted the Census. Once more data becomes available, this cost-benefit exercise could be expanded to include more detail on the effects of the College on Aboriginal people.

5.5.1 Impacts on First Nation governments

First Nation governments bear direct costs of approximately $300,000 to $350,000 paid to the College for providing training and other services. These costs are modest and it is assumed that the governments value the services provided, otherwise they would be unwilling to pay for them. On the other hand, some First Nation governments pay tuition for their citizens.

First Nation governments receive the benefit of reduced Social Assistance payments to First Nation members resulting from education leading to more employment. A further benefit of employment gains is that First Nation governments implementing self-government can expect to benefit from higher taxes paid by citizens who have received College education and training.

Yukon College's community campuses also deserve mention. If College employees live on settlement land, most of their income taxes are paid to First Nation governments.

While lack of data currently does not allow us to quantify impacts on First Nation governments, it appears that they are receiving a net benefit from the College's operations. In any case, given the tangles fiscal relations, calculating the benefits and costs to First Nation governments is not possible, as was described above in Section 5.3.3.

5.5.2 Impacts on First Nation individuals

First Nation students make up between 29.3%[26] and 33%[27] of the Yukon College student body. The 2001 Census found that First Nation people make up 22.9% of the general population, implying that First Nation individuals are not underrepresented at Yukon College.

While the overall Yukon population is more highly educated than the Canadian average, the opposite is true of aboriginal people in the Yukon. The 1996 Census showed that almost 42% of Yukon First Nation people have not completed high school (compared with 34.8% of Canadians in general), and a very small percentage have university degrees. However, Yukon First Nations have relatively more skilled trades people (5.5% vs. 3.7%) and a larger proportion (37.0% vs. 24.2%) of citizens with other non-university education.

5.5.2.1 First Nation incomes

First Nation people have lower incomes on average than non-First Nations. A 1998 study by Pendakur & Pendakur found that aboriginal men earn 13% less than non-aboriginal men, and

[26] R.A. Malatest & Associates Ltd., Yukon College Institutional Report, 2002 Canadian College Student Survey Project, Table 1-3 p.7.
[27] 1999/2000 Yukon College Exit Survey Results.

aboriginal women earn 7% less than non-aboriginal women in Canada.[28] In 1994, George & Kuhn found a wage gap of about 11% between Aboriginals working full time and full year and non-aboriginal Canadians working the same. Lower education levels explain nearly 50% of that gap.[29] The wage gap was found to be even greater in the Territories, in part because non-aboriginals appear to receive a much higher "premium" for working in the North.

Given the average wage gap — and how much of the gap is attributable to lower education levels — First Nation students can look to relatively large average income benefits through studying at Yukon College.

First Nation individuals make up 50% of the College's Arts & Science students. The Arts & Science portion of the student body reaps the biggest benefits to individuals in terms of income, and therefore First Nation students are receiving a positive differential impact assuming that the FN students have the same graduation rates as others.

First Nation individuals also make up 50% of the College's Developmental Studies students. This is not surprising given the overall lower level of educational attainment among aboriginals. It is also encouraging given the important role that such studies play in preparing individuals for better employment and the positive signal the completion of each level of education sends to prospective employers.

5.5.2.2 Other impacts

A further benefit to First Nations is that many of Yukon College's community campuses are located in largely First Nation communities. This allows and encourages First Nation students to get a start on furthering their education without moving from their communities. Average low incomes among First Nations also make it more difficult for Aboriginal students to go Outside for their studies.

[28] Pendakur, Krishna & Pendakur, Ravi (1998). "The colour of money: earnings differentials among ethnic groups in Canada."
[29] George, Peter & Kuhn, Peter (1994). "The size and structure of native-white wage differentials in Canada."

6 Summary and Conclusions

6.1 Economic Impact

6.1.1 Total Impacts

The total direct and indirect impacts of Yukon College on the Yukon's GDP and on employment in the territory using multipliers from Statistics Canada's 1999 Inter-provincial Input-Output model are summarized in Table 63.

Table 63: Yukon College impact on GDP and employment: direct & indirect

	Spending	Multiplier	Total impact
GDP impact	$21.7 million	0.84	$18.2 million
Employment impact	$21.7 million	11.19 (per $1m)	243 person-years

The GDP multiplier is less than one because of economic leakages out of the Yukon caused by both the College and the College's local suppliers importing goods and services.

The total GDP impact of $18.2 million consists of $14.2 million of direct impact and $4.0 million of indirect impact. The total employment impact of 243 person-years consists of 216 person-years of direct employment and 27 person-years of indirect employment.

Following the overall wish to not make this project an "advocacy analysis" that inflates impacts, induced impacts are not included in the calculation of the overall economic impact of the College.

6.1.2 Share of the economy

The College represents between 1.5 and 1.8 per cent of the Yukon's $1.2 billion GDP. Comparing it to value added for other industries in 2001, the college is larger than the oil and gas industry in terms of value-added to the Yukon economy, and about the same size as utilities (electricity generation and water & sewer services) and hospitals.

The 191 term or permanent employees at Yukon College represent about 1.3% of the Yukon's labour force. However, if all people who worked for Yukon College are counted, about 4.3% of the Yukon's labour forced worked for the College at some point in 2002.

6.1.3 Taxes

The College directly generates approximately $2.6 million in income taxes and GST for governments each year. Approximately $1.7 million of the total goes to the federal government and $900,000 goes to the Yukon government.

6.1.4 Community level impacts

Table 64 below summarizes the total local income and employment impacts for the 13 Yukon communities in which the College has a presence using Informetrica Limited's Local Area Impact Model.

Table 64: Summary of community impacts: local income & employment

	Contribution to local income		Contribution to local employment	
Community	Dollars	Per cent of local income	Person-years	Per cent of employment
Beaver Creek	8,300	0.4%	0.3	0.8%
Carcross	134,000	2.5	4.3	8.0
Carmacks	196,900	2.8	5.9	5.0
Dawson City	373,600	1.0	5.7	1.0
Faro	145,100	2.2	3.0	2.7
Haines Junction	119,300	0.8	2.5	1.2
Mayo	113,700	1.4	2.5	2.0
Old Crow	139,900	3.3	3.0	3.3
Pelly Crossing	205,900	4.5	4.1	3.9
Ross River	100,800	2.3	1.9	2.1
Teslin	195,300	2.7	3.9	4.7
Watson Lake	284,800	1.0	6.1	1.7
Whitehorse	16,990,260	3.2	373.4	3.9

Because of issues with the model and with some of the data (see Sections 4.1.1 and 4.1.2), some care must be taken in interpreting the results shown in the table The Whitehorse employment results appear too high given the Yukon total direct and indirect employment impact from the Statistics Canada's 1999 Input-Output model is only 243 person-years of employment.

6.2 Cost-benefit

The following Table 65 summarizes the results of the cost-benefit analysis. The total private and social costs of educating students at Yukon College are about $48 million, offset by about $83 million in current and future benefits. Based on the assumptions outlined above, this results in a net benefit of at least $35.3 million. The largest costs are the direct College operating costs and the opportunity cost of students' time. The costs related to tranfers payments (EI and Other transfers) are offset by corresponding benefits, so they have no net effect.

Lifetime income gains for students are by far the largest benefit, outweighing costs by themselves. Other relatively large benefits include the value to employers of locally available training and health care cost savings. It should be noted that the export figure is an underestimate as it excludes living costs of foreign students.

Note that all costs and benefits presented in Table 65 are at the Canada level of analysis. For the Yukon only, costs would be about the same. However, benefits would differ considerably. The biggest difference would be how much of the future earnings would accrue in the Yukon. Available data does not allow calculating this figure. However, looking at Yukon government spending, only about one-fifth of students need to remain in the territory for their income gains to offset Yukon government spending on the College. It should be noted that exports would be greater, as some federal government spending and non-resident Canadian student spending should be considered exports.

The measured benefits exclude a number of "intangibles" whose value cannot be measured. These include the value of a trained workforce in attracting capital investment, provision of cheap part-time labour by students without a corresponding impact on social service agencies, and stimulation of research and development activities in the Yukon.

Table 65: Summary of Costs and benefits

Costs	
Direct College Operating Costs	$21,927,214
Cost of tuition and educational supplies purchased by students	726,225
Opportunity Cost of students' time	22,292,281
Increased Employment Insurance cost to government	1,103,143
Reduced Transfer Payments income by individuals	1,721,673
Total Costs	$47,770,536
Benefits	
Increased income for students	$69,376,027
Savings by students remaining in the Yukon	804,000
Intrinsic value of taking courses for interest for non-degree taking students	Not Available
Value of locally available training	5,209,000
Improved health	4,283,128
Reduction in transfer payments costs to governments	1,721,673
Increased EI income by individuals	1,103,143
Value to community of use of College facilities	41,000
Exports	233,067
Crime reduction	294,275
Other positive externalities – not measured	Not Available
Total Benefits	$83,065,312
Net benefit (Net cost)	**$35,294,777**

6.2.1 Rates of return

Rates of return are an alternative to comparing dollar costs and benefits. Different rates of return have been calculated as part of this study. The overall social rate of return, taking into consideration all costs and benefits to everyone is 8.5% per year. Looking at student's rate of return on their expenses and opportunity cost of time, students get a 14.7% annual return on their investment. For governments, comparing their expenditures on the College to their benefits in terms of increased tax revenues and reduced social charges, yields a 4.8% rate of return.

Appendix A: Local Area Impact Model Data Summary

Beaver Creek:

Total local income:
- estimated at $2,063,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 60 people with Beaver Creek addresses declared some employment income.
- in the 2001 Census, 50 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- the data on how many of those employed are in full-time, year-round jobs and their average earnings has been suppressed by the Census.
- based on the average of all rural Yukon communities with data, we estimate that 22 of the 50 employed (44%) are in full-time, year-round jobs and 28 are either part-time or seasonal.

Average weekly earnings:
- to calculate the average weekly earnings of the local labour force we have used the average earnings of all rural Yukon communities with data in the 2001 Census.
- the average earnings for a full-time, year-round job in the rural Yukon is $39,002 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $19,501 annually.
- the overall average weekly earnings for Beaver Creek are therefore estimated at $540.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Kluane region to be approximately $40 per person per night.

Carcross

Total local income:
- estimated at $5,295,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 180 people with Carcross addresses declared some employment income.
- in the 2001 Census, only 75 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- the data on how many of those employed are in full-time, year-round jobs and their average earnings has been suppressed by the Census.
- based on the average of all rural Yukon communities with data, we estimate that 33 of the 75 employed (44%) are in full-time, year-round jobs and 42 are either part-time or seasonal.

Average weekly earnings:

- to calculate the average weekly earnings of the local labour force we have used the average earnings of all rural Yukon communities with data in the 2001 Census.
- the average earnings for a full-time, year-round job in the rural Yukon is $39,002 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $19,501 annually.
- the overall average weekly earnings for Carcross are therefore estimated at $540.

Tourist spending:

- the 1999 Visitor Exit Survey estimates average tourist spending in the Carcross region to be approximately $41 per person per night.

Carmacks:

Total local income:

- estimated at $6,937,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:

- in the 1999 tax year, 250 people with Carmacks addresses declared some employment income.
- in the 2001 Census, only 165 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 70 of the 165 employed hold full-time, year-round jobs while 95 are part-time or seasonal.

Average weekly earnings:

- the average earnings for a full-time, year-round job in Carmacks is $36,478 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $18,239 annually.
- the overall average weekly earnings for Carmacks are therefore estimated at $500.

Tourist spending:

- the 1999 Visitor Exit Survey estimates average tourist spending in the Campbell region to be approximately $31 per person per night.

Local property taxes:

- in 1999 Carmacks collected $194,167 in property taxes and grants in lieu.
- with an estimated 117.5 FTE jobs, $1,652 was collected per FTE.

Dawson City:

Total local income:

- estimated at $35,095,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 960 people with Dawson City addresses declared some employment income.
- in the 2001 Census, 775 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 340 of the 775 employed hold full-time, year-round jobs while 435 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Dawson is $41,038 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $20,519 annually.
- the overall average weekly earnings for Dawson are therefore estimated at $568.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Klondike region to be approximately $85 per person per night.

Local property taxes:
- in 1999 Dawson City collected $1,408,584 in property taxes and grants in lieu.
- with an estimated 557.5 FTE jobs, $2,527 was collected per FTE.

Faro

Total local income:
- estimated at $6,637,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 190 people with Faro addresses declared some employment income.
- in the 2001 Census, 160 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 65 of the 160 employed hold full-time, year-round jobs while 95 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Faro is $37,971 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $18,986 annually.
- the overall average weekly earnings for Faro are therefore estimated at $513.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Campbell region to be approximately $31 per person per night.

Local property taxes:
- in 1999 Faro collected $609,029 in property taxes and grants in lieu.
- with an estimated 112.5 FTE jobs, $5,414 was collected per FTE.

Haines Junction

Total local income:
- estimated at $14,458,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 410 people with Haines Junction addresses declared some employment income.
- in the 2001 Census, 300 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 125 of the 300 employed hold full-time, year-round jobs while 175 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in the Junction is $42,467 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $21,234 annually.
- the overall average weekly earnings for Haines Junction are therefore estimated at $578.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Kluane region to be approximately $41 per person per night.

Local property taxes:
- in 1999 Haines Junction collected $404,873 in property taxes and grants in lieu.
- with an estimated 212.5 FTE jobs, $1,905 was collected per FTE.

Mayo

Total local income:
- estimated at $8,278,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 250 people with Mayo addresses declared some employment income.
- in the 2001 Census, 185 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 65 of the 185 employed hold full-time, year-round jobs while 120 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Mayo is $43,284 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $21,642 annually.
- the overall average weekly earnings for Mayo are therefore estimated at $562.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Silver Trail region to be approximately $106 per person per night.

Local property taxes:
- in 1999 Mayo collected $193,781 in property taxes and grants in lieu.
- with an estimated 125 FTE jobs, $1,550 was collected per FTE.

Old Crow

Total local income:
- estimated at $4,193,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 140 people with Old Crow addresses declared some employment income.
- in the 2001 Census, 135 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 50 of the 135 employed hold full-time, year-round jobs while 85 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Old Crow is $46,709 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $23,354 annually.
- the overall average weekly earnings for Old Crow are therefore estimated at $615.

Tourist spending:
- the 1999 Visitor Exit Survey shows 100% of visitors to the North Yukon region getting there by motor vehicle, therefore we have no estimate of spending for visitors to Old Crow.

Pelly Crossing

Total local income:
- estimated at $4,562,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 200 people with Pelly Crossing addresses declared some employment income.
- in the 2001 Census, 140 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 70 of the 140 employed hold full-time, year-round jobs while 70 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Pelly Crossing is $39,436 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $19,718 annually.
- the overall average weekly earnings for Old Crow are therefore estimated at $569.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Campbell region to be approximately $31 per person per night.

Ross River

Total local income:
- estimated at $4,306,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 160 people with Ross River addresses declared some employment income.
- in the 2001 Census, 120 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 60 of the 120 employed hold full-time, year-round jobs while 60 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Ross River is $32,978 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $16,489 annually.
- the overall average weekly earnings for Ross River are therefore estimated at $476.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Campbell region to be approximately $31 per person per night.

Teslin

Total local income:
- estimated at $7,254,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 250 people with Teslin addresses declared some employment income.
- in the 2001 Census, 155 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- the data on how many of those employed are in full-time, year-round jobs and their average earnings has been suppressed by the Census.

- based on the average of all rural Yukon communities with data, we estimate that 51 of the 115 employed (44%) are in full-time, year-round jobs and 64 are either part-time or seasonal.

Average weekly earnings:
- to calculate the average weekly earnings of the local labour force we have used the average earnings of all rural Yukon communities with data in the 2001 Census.
- the average earnings for a full-time, year-round job in the rural Yukon is $39,002 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $19,501 annually.
- the overall average weekly earnings for Teslin are therefore estimated at $540.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Teslin region to be approximately $22 per person per night.

Local property taxes:
- in 1999 Teslin collected $171,328 in property taxes and grants in lieu.
- with an estimated 83 FTE jobs, $2,064 was collected per FTE.

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Watson Lake

Total local income:
- estimated at $28,881,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self employment have not been subtracted (as they should be) due to lack of data.

Employment:
- in the 1999 tax year, 900 people with Watson Lake addresses declared some employment income.
- in the 2001 Census, only 465 locals declared themselves employed.
- we have used the 2001 Census data in the model.
- 255 of the 465 employed hold full-time, year-round jobs while 210 are part-time or seasonal.

Average weekly earnings:
- the average earnings for a full-time, year-round job in Watson Lake is $34,242 annually.
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $17,121 annually.
- the overall average weekly earnings for Watson Lake are therefore estimated at $510.

Tourist spending:
- the 1999 Visitor Exit Survey estimates average tourist spending in the Watson Lake region to be approximately $57 per person per night.

Local property taxes:
- in 1999 Watson Lake collected $1,026,912 in property taxes and grants in lieu.
- with an estimated 360 FTE jobs, $2,853 was collected per FTE.

Whitehorse

Total local income:

- estimated at $534,290,000 through all declared income from 1999 tax year.
- capital cost allowance expenditures for self-employment have not been subtracted (as they should be) due to lack of data.

Employment:

- in the 1999 tax year, 12,930 people with Whitehorse addresses declared some employment income.
- in the 2001 Census (using the Whitehorse Agglomeration Area), 12,165 declared themselves employed.
- we have used the 2001 Census data in the model.
- 7,025 of the 12,165 employed hold full-time, year-round jobs while 5,140 are part-time or seasonal.

Average weekly earnings:

- the average earnings for a full-time, year-round job in Whitehorse is $46,116 annually (2001 Census).
- in order to avoid over-estimating impacts, we are assuming that all part-time or seasonal workers earn one half of full-time workers, or $23,058 annually.
- the overall average weekly earnings for Whitehorse are therefore estimated at $699.

Tourist spending:

- the 1999 Visitor Exit Survey estimates average tourist spending in the Whitehorse region to be approximately $56 per person per night. This figure is a trimmed average (eliminating both very high and very low spenders from the average).
- 25% of spending was on transportation, 29% on accommodation, 17% on restaurants, and 29% on shopping and other spending.

Local property taxes:

- in 1999 Whitehorse collected $16,104,879 in property taxes and grants in lieu.
- with an estimated 9,595 FTE jobs, $1,678 was collected per FTE.

Appendix B: Yukon College Spending by Industry

Industry	*Yukon*	*Outside*	*Grand Total*
Educational Services	142,629	655,786	798,415
Insurance Carriers and Related Activities	93,262	641,053	734,315
Electronics and Appliance Stores	702,224	30,955	733,179
Publishing Industries	133,542	571,373	704,915
Professional, Scientific and Technical Services	231,641	230,078	461,719
Religious, Grant-Making, Civic, and Professional and Similar Organizations	318,659	83,936	402,595
Aboriginal Public Administration	372,590	395	372,985
Provincial and Territorial Public Administration	288,704	5,066	293,770
Broadcasting and Telecommunications	220,583	0	220,583
Food, Beverage and Tobacco Wholesaler-Distributors	141,307	44,915	186,222
Credit Intermediation and Related Activities	5,200	179,902	185,102
Information Services and Data Processing Services	78,285	87,744	166,029
Miscellaneous Store Retailers	145,354	8,047	153,401
Securities, Commodity Contracts, and Other Financial Investment and Related Activities		146,006	146,006
Social Assistance	84,171	0	84,171
Printing and Related Support Activities	66,584	16,939	83,523
Accommodation Services	72,887	0	72,887
Miscellaneous Wholesaler-Distributors	30,065	40,677	70,742
Non-Store Retailers	30,620	39,386	70,006
Computer and Electronic Product Manufacturing		55,015	55,015
Real Estate	46,629	0	46,629
Food and Beverage Stores	43,442	0	43,442
Scenic and Sightseeing Transportation	42,947	0	42,947
Food Services and Drinking Places	33,202	0	33,202
Administrative and Support Services	15,676	17,398	33,074
Furniture and Home Furnishings Stores	31,097	0	31,097
Building Material and Garden Equipment and Supplies Dealers	30,003	0	30,003
Local, Municipal and Regional Public Administration	24,480	0	24,480
Machinery, Equipment and Supplies Wholesaler-Distributors		24,017	24,017
Miscellaneous	20,817	0	20,817
Repair and Maintenance	19,697	0	19,697
Couriers and Messengers	9,320	9,481	18,801
Rental and Leasing Services	15,403	1,428	16,831
Sporting Goods, Hobby, Book and Music Stores	11,967	1,561	13,528
Air Transportation	11,586	732	12,318
Waste Management and Remediation Services	12,058	0	12,058
Motion Picture and Sound Recording Industries	4,351	7,376	11,727
Mining (except Oil and Gas)	11,675	0	11,675
Motor Vehicle and Parts Dealers	11,593	0	11,593
Utilities	8,981	0	8,981
General Merchandise Stores	8,099	0	8,099
Fabricated Metal Product Manufacturing	7,452	303	7,755

Industry	*Yukon*	*Outside*	*Grand Total*
Machinery Manufacturing	307	4,795	5,102
Federal Government Public Administration	100	4,803	4,903
Wood Product Manufacturing	4,846	0	4,846
Gasoline Stations	4,505	0	4,505
Warehousing and Storage	0	4,154	4,154
Truck Transportation	4,086	0	4,086
Building Material and Supplies Wholesaler-Distributors	3,859	0	3,859
Miscellaneous Manufacturing		3,802	3,802
Personal and Laundry Services	2,780	695	3,475
Ambulatory Health Care Services	3,357	0	3,357
Leather and Allied Product Manufacturing	2,525	338	2,863
Trade Contracting	2,716	0	2,716
Transit and Ground Passenger Transportation	458	2,076	2,534
Lessors of Non-Financial Intangible Assets (Except Copyrighted Works)	0	2,521	2,521
Postal Service	2,316	0	2,316
Amusement, Gambling and Recreation Industries	2,098	0	2,098
Performing Arts, Spectator Sports and Related Industries	1,812	0	1,812
Health and Personal Care Stores	1,770	0	1,770
Clothing Manufacturing	0	1,691	1,691
Plastics and Rubber Products Manufacturing	0	1,417	1,417
Petroleum Product Wholesaler-Distributors	1,165	0	1,165
Animal Production	1,153	0	1,153
Hospitals	1,117	0	1,117
Heritage Institutions	569	348	917
Prime Contracting	535	0	535
Clothing and Clothing Accessories Stores	111	188	299
Electrical Equipment, Appliance and Component Manufacturing	0	269	269
Support Activities for Transportation	199	0	199
Paper Manufacturing	158	0	158
Chemical Manufacturing	0	154	154
International and Other Extra-Territorial Public Administration	0	150	150
Wholesale Agents and Brokers	0		19

Appendix C: Yukon College Spending by Commodity

Commodity	*Yukon*	*Outside*	**Total**
Trust deposit	-	1,150,972	1,150,972
Educational institutions materials, fees & services	200,945	695,972	896,917
Insurance	93,262	641,053	734,315
Computers, video units, printers, etc.	679,533	32,630	712,163
Books	5,528	421,706	427,234
Bank charges & commissions	5,200	377,877	383,077
First Nation government services	371,840	395	372,235
Software & systems design	124,532	182,875	307,407
Territorial & provincial government services	288,704	5,066	293,770
Professional & technical services	151,880	133,234	285,114
Food products	183,427	45,058	228,485
Telecommunications, cable	215,906	-	215,906
Janitorial & other admin/support services	64,156	102,057	166,213
Newspapers (including ads) & periodicals	133,542	14,885	148,427
Trade unions dues	132,967	-	132,967
Petty Cash & Community Campus	94,313	-	94,313
Health services & social services	90,495	3,746	94,241
Other office & electronic equipment	44,709	49,433	94,142
Other printed matter	66,808	16,951	83,759
Online information services	-	74,930	74,930
Hotels & accommodations	72,887	-	72,887
Membership dues	34,747	37,573	72,320
Rent	70,210	-	70,210
Hardware & other metal products	63,947	3,630	67,577
Lumber & wooden products	51,529	-	51,529
Office supplies	34,765	16,641	51,406
Other transportation	44,157	6,249	50,406
Motorized vehicles, parts & service	34,267	11,301	45,568
Stationary & other paper products	10,995	28,447	39,442
Equipment and machinery rentals	6,861	28,558	35,419
Restaurant meals	33,202	-	33,202
Furniture	31,097	1,087	32,184
Other government services	24,580	4,370	28,950
Recreational equipment, toys & craft supplies	27,353	837	28,190
Instrumentation & other similar equipment	5,801	21,189	26,990
Courier & Postage	11,728	10,950	22,678
Cleaning products & chemicals	18,142	760	18,902
Fuels	16,697	-	16,697
Amusement and recreation services	8,641	8,012	16,653
Automobile rental	12,425	-	12,425
Air passenger transportation	11,586	732	12,318
Leather, fur & textile products & clothing	8,605	3,490	12,095
Mining products & services	11,675	-	11,675
Other building materials & hardware	6,618	3,197	9,815
Electric power	8,981	-	8,981
Machinery & parts	7,986	420	8,406

Commodity	*Yukon*	*Outside*	**Total**
Nursery stock	2,159	-	2,159
Plastic products (containers & cups)	-	2,106	2,106
Construction	1,936	-	1,936
Total	**3,621,324**	**4,138,389**	**7,759,713**

Appendix D: Health Indicators and Education Levels

There are a large number of indicators of health, and masses of data on specific health conditions and behaviours.

Health Issue	*Indicator*	*LT high school*	*High School*	*College*	*University*
STRESS					
Life Stress	% reporting high stress	30	28	25	15
Work stress	Average stress index	20.6	19.7	19.5	17.4
Psychological health	% who had high self-esteem	41	51	47	53
Job satisfaction	% NOT satisfied with their job	8	11	7	8
WEIGHT & DIET					
Weight	% of overweight people (Body Mass Index 27.0+)	36	30	29	22
Physical Activity	% who do NOT engage in leisure time physical activity	61	57	52	47
Diet – fat	% NOT concerned about dietary fat	40	32	30	17
Diet – fibre & starch	% NOT concerned about dietary fibre & starch	62	56	52	42
SMOKING					
Smoking	% who are current smokers	39	28	25	14
Second-hand smoke	% facing restrictions on smoking at home	18	26	28	36
Awareness of health impacts of smoking	% who believe smoking has no impact	6	3	2	2
Awareness of health impacts of second-hand smoke	% who believe there is no risk	20	14	12	8
ALCOHOL & DRUGS					
Alcohol	% who are regular drinkers	44	56	55	61
Alcohol	% who drink more than 14 drinks/week	11	9	9	7
Alcohol – Heavy drinking	Percentage who never have 5 or more drinks	55	57	61	66
Illicit drugs	% who used at some time in their life	19	24	32	29
SICK DAYS					
Disability days	Average number of days disabled in previous two weeks	.99	.83	.89	.65
PREVENTATIVE ACTIONS					
Visit health care professional	% who did NOT visit a health care professional in previous year	22	20	17	18
Alternative health care	% who used alternative health care	3	6	8	9
Influenza Immunization	% ever having had a flu shot	26	26	25	25

Health Issue	*Indicator*	*LT high school*	*High School*	*College*	*University*
Pap Smear	% of women who ever had one	81	88	90	89
Mammogram	% of women who ever had one	57	61	64	63
Breast examination	% of women who ever had examination by physician	68	76	79	80
Blood pressure	% who never had a blood pressure check up	6	5	3	2
HIV	% ever tested	11	15	16	18
OTHER BEHAVIOUR					
Environmental – water purity	% who drink purified water	33	40	46	43
Environmental – organic foods	% who eat organic foods	37	42	39	43
Breast feeding	% of mothers who breast-fed their last child	60	78	79	95
Bicycle helmet	% of bicycle riders who never wear a helmet	71	65	49	34
Seat-belt use	% of drivers who insist that passengers always wear a seat belt	85	86	85	86
High-risk sex	% who never use a condom with new partners	8	7	8	4
Healthy behaviour changes	% who took action to improve health in last year	39	46	45	46
CHRONIC CONDITIONS					
Non-food allergies	% with non-food allergies	16	23	22	24
Food allergies	% with food allergies	5	7	6	7
Arthritis/ rheumatism	% with arthritis/ rheumatism	16	14	14	10
Back problems	% with back problems	15	15	15	11
High blood pressure	% with high blood pressure	12	10	10	8
Migraine headache	% with migraine headache	7	8	9	7
Asthma	% with asthma	7	7	6	6

Source: Health Canada, Statistics Canada, & Canadian Institute for Health Information, *Statistical Report on the Health of Canadians 1999*

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