



STILETTO

NBCC ECONOMIC IMPACT REPORT

NEW BRUNSWICK COMMUNITY COLLEGE

JANUARY 2021

EXECUTIVE SUMMARY

New Brunswick Community College (NBCC) is an economic and social catalyst for the province. The college's operations are important drivers for the provincial and municipal economies, creating value for NBCC's main stakeholders: students, communities, industry, governments, and taxpayers.

Economic Impact Of NBCC

- In 2019-20, NBCC's operational spending of \$87 million supported 1,038 employees across New Brunswick. This spending boosted provincial GDP by an estimated \$70.7 million. It also induced an estimated \$21.5 million in provincial and municipal tax revenue during the year. Including supply chain and induced effects, provincial GDP contribution by NBCC rose to \$101.6 million, total employment to 1,377, and total labour income to \$77.1 million.
- NBCC's payroll of \$64.7 million (including direct, indirect, and induced income) resulted in more than \$57 million spent on food, shelter, transportation, and other household expenditures during the year (2019-20).
- International students enrolled at NBCC (2019-20) spent more than \$19.4 million on living expenses during that time. Their spending supported 249 full-time equivalent jobs, \$10.5 million in labour income, and induced \$3.6 million in total tax revenue.
- Including living expenses of international students, NBCC provincial GDP impact rose to \$114.2 million. Total labour income also increased to \$87.6 million, with 1,627 full-time equivalent jobs supported, \$76.7 million in household spending, and \$32.7 million of tax revenue, of which \$21.3 million accrues to NB provincial and municipal governments.
- In 2015-20, applied research activities at NBCC grew rapidly, increasing by more than 30 per cent year-over-year, mostly supporting small and medium enterprises (SMEs). This growth boosted provincial GDP by an estimated \$1.7 million and generated \$1.3 million in labour income. This amount is equivalent to supporting 22 average-wage jobs.
- The 2,664 NBCC graduates of 2019-20 (2,960 graduates with an assumed 90 per cent retention rate) is estimated to generate a yearly provincial GDP boost of \$354 million. Their direct labour income is \$220 million, supporting 4,079 full-time equivalent jobs (FTE). Figure 1 summarizes this economic footprint.
- As of 2019, approximately 94 per cent of students who attended NBCC stayed in New Brunswick after graduation. Their applicable and relevant skills matched provincial labour demands and bolstered the output of local employers.
- It is estimated that approximately 53,900 of the college-educated workforce in New Brunswick graduated from NBCC (2015). Their direct labour income was more than \$2.2 billion. These jobs were associated with total labour income of \$3.2 billion (including indirect and induced impacts) and nearly 70,500 jobs (FTE). In total, NBCC graduates worked in jobs that supported a provincial GDP of \$7.2 billion, or approximately 21 per cent of the total GDP. Their accumulated contribution to the economy is highlighted in Figure 2.

Figure 1: Projected economic footprint associated with 2019-20 NBCC graduates, New Brunswick, annually¹

INDICATOR	YEARLY IMPACT
NBCC graduates employed	2,664
Associated Total employment (FTE)	4,079
Provincial GDP associated with graduates (with indirect and induced effects)	\$354,000,000
Total labour income	\$222,000,000
Household spending	\$165,000,000
Total induced tax revenues	\$87,500,000
Provincial and municipal government tax revenue only	\$56,900,000

Source: Stiletto Analysis, 2021

Figure 2: Economic footprint associated with all NBCC graduates, New Brunswick, 2015²

INDICATOR	IMPACT
Estimated number of NBCC-educated workforce in New Brunswick	53,912
Associated total employment (FTE)	70,447
Direct labour income of the NBCC-educated workforce in New Brunswick	\$2,208,563,000
Total employment income premium associated with NBCC education (compared to high-school graduates)	\$ 505,332,000
Total labour income of the NBCC-educated workforce in New Brunswick	\$3,218,800,000
Provincial GDP associated with NBCC graduates (with indirect and induced effects)	\$7,165,300,000

Source: Stiletto Analysis, 2021

Return On Investment

- In 2019-20, NBCC provided a return for every dollar of the government of New Brunswick (GNB) grant of \$4.76. For every \$1 of GNB investment, NBCC leveraged a total of additional 98 cents from tuition and fees, the sales of services, and international student spending.
- It is estimated that the 2,664 NBCC graduates of 2019-20 will generate approximately \$242 million *more* in tax revenue associated with their wages compared to high-school graduates who did not continue their education (across the next 20 years, in 2020 dollars), providing a return for every dollar of tuition investment of \$5.53.

Forecasted NBCC Economic Impact to 2039-40

The report includes an economic forecast from the 2019-20 baseline year through to 2024-25, 2029-30, and 2039-40. Figure 3 highlights the direct and total economic impact of NBCC's operations and of NBCC's graduates.

By 2039-40, NBCC's operations will generate a provincial GDP contribution of \$182.9 million, supported a total of 2,159 jobs in New Brunswick, and total induced taxes of \$46.7 million.

The annual economic impact of new NBCC graduates will rise substantially across the 20-year period. Between 2019-20 and 2039-40, all NBCC graduates throughout the period will induce the following cumulative economic effects (in 2020 dollars):

- \$5.8 billion in labour income;
- \$4.3 billion household spending; and,
- \$1.5 billion in provincial and municipal government tax revenue.

Figure 3: Projected growth and economic footprint, NBCC, 2019-20 through 2039-40 (\$millions)^{3, 4}

INDICATOR	FORECAST			
	ACTUAL 2019-20	YEAR 5 2024-25	YEAR 10 2029-30	YEAR 20 2039-40
OPERATIONS				
Total learners	9,531	12,000	13,514	16,473
Total students in continuing education	4,355	4,757	5,357	6,530
International students	882	1,100	1,561	1,902
Direct employment (FT and PT)	1,038	1,042	1,106	1,222
Tuition and fees	\$17.0	\$20.4	\$23.3	\$28.4
Total expenses (output)	\$87.0	\$95.5	\$109.1	\$133.0
Direct payroll	\$64.7	\$68.9	\$74.2	\$82.0
Direct provincial GDP	\$70.7	\$77.5	\$88.6	\$108.0
TOTAL ECONOMIC IMPACTS				
Jobs	1,627	1,694	1,909	2,159
Provincial GDP	\$114.2	\$127.1	\$150.0	\$182.9
Labour income	\$87.6	\$95.3	\$107.4	\$120.8
Household spending	\$76.7	\$85.3	\$100.7	\$115.2
Total induced tax revenue	\$32.7	\$35.8	\$40.7	\$46.7
Taxes induced: Provincial and municipal government tax revenue only	\$21.3	\$23.2	\$26.4	\$30.4

Figure 3: Projected growth and economic footprint, NBCC, 2019-20 through 2039-40 (\$millions) (con't)

INDICATOR	FORECAST			
	ACTUAL 2019-20	YEAR 5 2024-25	YEAR 10 2029-30	YEAR 20 2039-40
GRADUATES				
Total continuing education graduates	2,960	3,268	3,608	4,398
Graduate retention in New Brunswick (@ 90%)	2,664	2,941	3,247	3,959
Total employment supported (FTE)*	4,079	4,503	4,972	6,061
Provincial GDP associated with graduates*	\$354.1	\$391.0	\$431.7	\$526.2
Total labour income*	\$221.8	\$244.9	\$270.4	\$329.6
Household spending*	\$164.8	\$181.9	\$200.8	\$244.8
Taxes induced: Provincial and municipal government tax revenue only*	\$56.9	\$62.8	\$69.3	\$84.5
CUMULATIVE IMPACTS				
Cumulative 2019-20 to 2039-40 NBCC graduates in the workforce (assumes long term retention rate of 90%)	2,664	16,805	32,417	68,687
Cumulative labour income supported*	\$221.8	\$1,416.9	\$2,736.4	\$5,801.7
Cumulative household spending supported*	\$164.8	\$1,052.4	\$2,032.5	\$4,309.2
Taxes induced: Cumulative provincial and municipal government tax revenue only by NBCC graduates*	\$56.9	\$363.3	\$701.7	\$1,487.8

Source: Stiletto Analysis, 2021

TOTAL NBCC ECONOMIC IMPACT

FY 2019-20 (OPERATIONS + GRADUATES)



\$462.8 MILLION

IN GDP



\$309.7 MILLION

LABOUR INCOME



\$120.3 MILLION

INDUCED TAX REVENUES

THE 53,000+ NBCC ALUMNI...



BOOSTED PROVINCIAL GDP BY

\$7.2 BILLION

(21% OF TOTAL GDP)



SUPPORTED

70,500 JOBS



APPLIED RESEARCH ACTIVITY
AT NBCC INCREASED BY

30 PER CENT

YEAR OVER YEAR



FOR EVERY \$1.00 INVESTED NBCC PROVIDED RETURN OF...

\$4.76 TO TAXPAYERS

\$5.53 FOR STUDENTS

DURING THE NEXT 20 YEARS,

NEW NBCC GRADUATES WILL INDUCE



\$5.8 BILLION

IN LABOUR INCOME



\$4.3 BILLION

IN HOUSEHOLD SPENDING



\$1.5 BILLION

IN PROVINCIAL AND MUNICIPAL
GOVERNMENT TAX REVENUE

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NBCC ECONOMIC IMPACT ANALYSIS: 2019-20

Introduction

New Brunswick Community College (NBCC) is an economic and social catalyst for the province. The college's operations are important drivers for the provincial and municipal economies, creating value for NBCC's main stakeholders: students, communities, industry, governments, and taxpayers.

The Government of New Brunswick (GNB) provides significant public investment to the college, ensuring the provincial workforce has the proper skills – to meet the demands of local employers, to satisfy local access to higher education, and to enable economic growth. When compared with other provinces, the New Brunswick community college sector is particularly important to the labour market (refer to the NBCC Social Impact Assessment report).

This study demonstrates that NBCC:

- has a significant positive economic impact on the business community in the provincial economy; and,
- contributes strongly to a skilled provincial workforce.

Note: All currency in this document is presented in Canadian dollars (CAD).

College Education in High Demand in New Brunswick

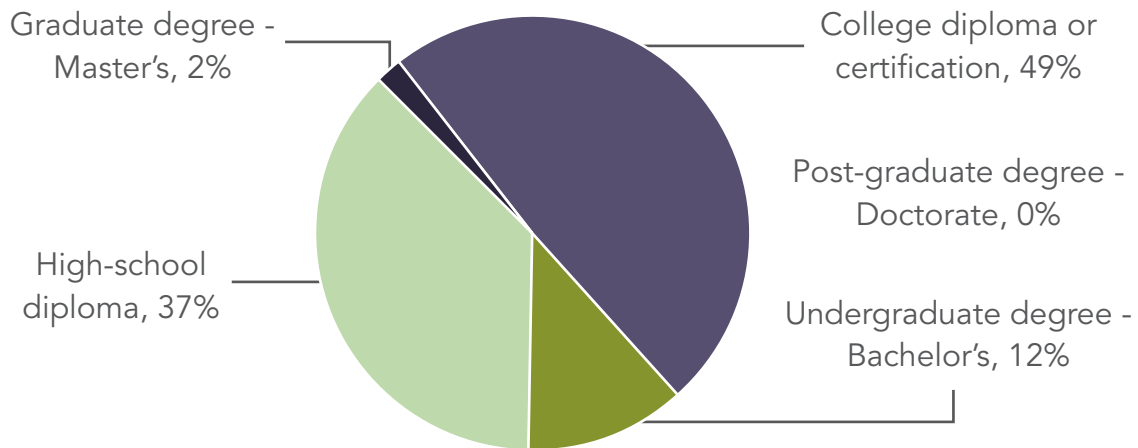
The demand for a college diploma in New Brunswick (NB) can be illustrated by the share of all job postings requiring college or related education. The research firm Vicinity Jobs reviewed online job postings from all major online sources, as well as direct employer recruitment sources. Between January 2018 and September 2020, 137,000 unique job postings across the province were analyzed. Of these postings, nearly half (64,950 jobs) specifically indicated the level of education associated with the job. Of those postings, a college diploma or certification was associated with nearly half of the postings (49%). In contrast, only 14 per cent of all job postings specifically indicated a university degree.

The Economic Case for Taxpayer Investment

There is also a significant economic rationale for the taxpayer to invest in NBCC through annual taxation. The economic case falls into four main categories:

- **GDP impact:** NBCC and the NB community college system has one of the largest GDP multipliers of any industry to the NB economy.

Figure 4: Percentage of online job postings, by education level, New Brunswick, January 2018 – September 2020⁵



*Note: Out of 64,950 job postings where the education requirements can be identified
Source: Vicinity Jobs, 2020*

- **Leveraged funding:** The government investment each year is leveraged by other sources of funding (unlike many other areas of government spending).
- **Tax multiplier:** There is a significant induced tax multiplier from the investment into NBCC, lessening the net cost to government each year.
- **Income premiums:** The income premium earned by college graduates translates into a significant return on government investment in the form of incremental tax revenues.

High GDP Multiplier from College Operational Spending

Governments invest in a wide variety of provincial services (e.g., hospitals, nursing homes, K-12 education, universities, road construction and maintenance, and public safety). In terms of provincial economic impact from direct spending, there is almost no better investment than the community college sector.

Statistics Canada has developed economic multipliers for more than 200 industries.

These multipliers indicate how much economic value stays in locations like New Brunswick from direct, supply chain, and induced economic effects. For example, if someone purchases a new car, most of the economic value (e.g., GDP, income, and taxes) is reflected where the car was manufactured. When the owner fills the car with gasoline, most of the economic value goes to the jurisdiction where the oil was extracted.

Likewise, spending in the NB community college sector mostly stays in New Brunswick. In fact, among the more than 200 industries, only the nursing and residential care and “other educational services” have a higher GDP multiplier. For every dollar of spending in New Brunswick’s community college sector, \$1.17 worth of provincial GDP is created. This amount is considerably higher than the university sector (\$1.05 worth of provincial GDP for every dollar of spending), business support services (\$1.00), and offices of physicians (\$0.97).

When the government invests in NBCC, that spending translates directly into wages and other sources of income, consumer spending, and tax revenues at a level that is much higher than for many other industries in New Brunswick. Every dollar invested in the community college system generates 12 per cent more provincial GDP than the same dollar invested in the university system.

Leveraging Other Sources of Funding and Economic Activity

In 2020-19, the provincial government provided a grant to NBCC of \$55.8 million. This grant was by far the college’s largest source of revenue. Unlike the majority of government spending on goods and services, however, public investment in NBCC leverages other funding sources (Figure 6). For example, for every dollar of GNB investment, another 63 cents are leveraged in the form of tuition and fees, sales, and other services. NBCC is well on

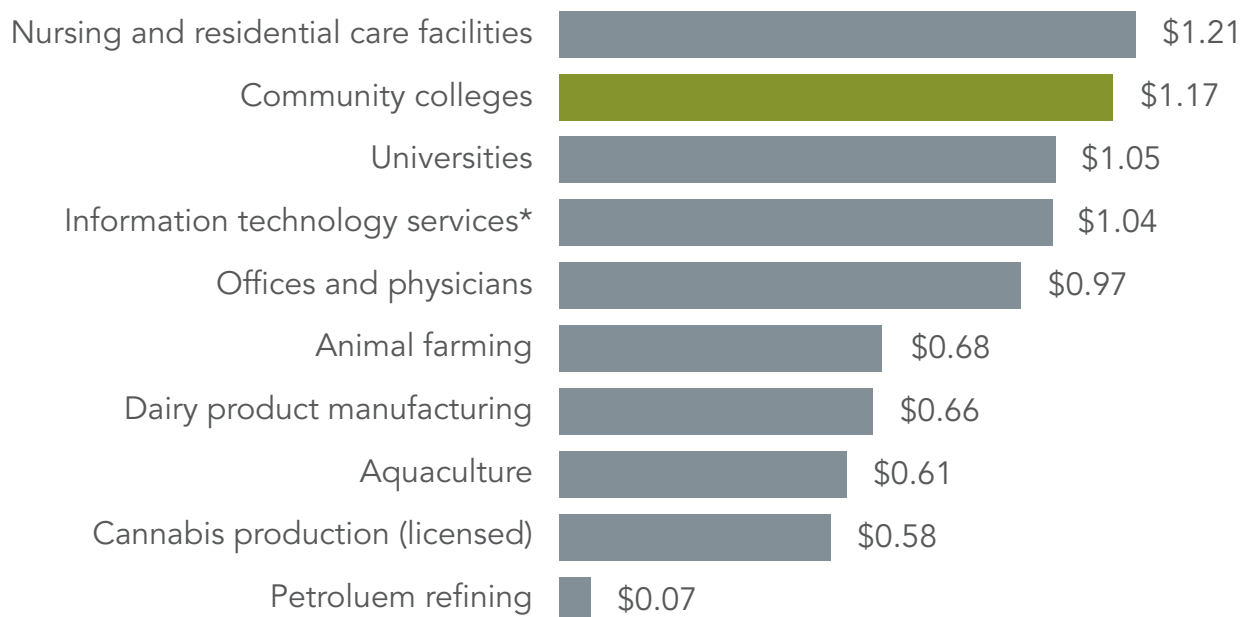
its way to meeting one of its strategic goals: increasing the share of total revenue from non-grant sources to 40 per cent by 2022.

There is other NBCC economic leveraging available beyond the direct funding sources. It is estimated that international students enrolled at NBCC in 2019-20 spent more than \$19.0 million on living expenses during the year, which increased the leverage ratio to 98 cents in other spending for every dollar of the GNB grant investment.

Operational Spending Generates Significant Direct Tax Revenue

NBCC operations in 2019-20 induced an estimated \$21.5 million in provincial and municipal tax revenue during the year. To that end, governments have a strong incentive to boost college acceptance and retention rates.

Figure 5: GDP per dollar of direct industry output, New Brunswick, 2017⁶



*Computer systems design and related services
Source: Statistics Canada, Table 36-10-0595-01

Figure 6: Revenue by source, NBCC, 2019-20⁷

REVENUE	FUNDING SOURCE \$	TOTAL %
Grant from province	55,367,645	61
Tuition and fees	19,252,868	21
Sales	3,838,721	4
Apprenticeship and cost recoveries	6,120,410	7
Contract training	4,231,089	5
Applied research	926,613	1
Other	527,560	1
Total revenue	90,264,906	100

Source: NBCC Internal Data

College Graduates Contribute Considerably More Tax Revenue Than Those without Post-Secondary Education

According to the 2016 Census, the average college graduate in New Brunswick earned \$41,000 in 2015 (full-time college graduate workers earned an average of \$51,500). This amount represented a 35 per cent income premium compared to those with a high-school diploma in New Brunswick. Assuming a modest 1.5 per cent annual increase in average income levels between 2015-20, the average college graduate would earn employment income of \$44,100 in 2020 (again full- and part-time / part-year workers combined) and the average worker with a high-school diploma would earn \$32,800.

Using the Ernst & Young income tax calculator (2020), the estimated annual income tax bill at these income levels can be derived. The income tax calculator estimates how much income tax is owed before additional deductions beyond the basic personal tax credit. As presented in Figure 7, the average community college graduate in 2020 would face an income tax bill of \$7,900 while the average worker with a high-school education would face a bill of less than \$4,900. This calculation means the average college graduate faces an initial income tax bill 63 per cent higher than those with a high-school education.

Figure 7: Annual income tax bill, New Brunswick, excluding tax credits, 2020⁸



Source: Ernst & Young income tax calculator for 2020. Does not include non-refundable tax credits other than the basic personal tax credit. Includes both federal and provincial income tax

NBCC's Economic Impact from Operations

New Brunswick Community College spent \$87 million in 2019-20 on its operations around New Brunswick. As discussed elsewhere in the document, the community college system in New Brunswick has one of the highest economic (GDP) multipliers of any industry. The public investment in NBCC translates into a significant economic impact just from operations.

To determine the GDP, income, employment, household spending, taxation and other impacts, an economic impact model was developed. The economic impact model is based on Statistics Canada's Input-Output (I-O) tables and detailed in Appendix I.

Estimating NBCC's Economic Impact from Operations, 2019-20

In 2019-20, the \$87 million in NBCC's operational spending included a payroll of \$64.7 million, supporting 1,038 NB employees. This direct spending by NBCC boosted provincial GDP by an estimated \$70.7 million.

Adding in supply chain and induced effects, the provincial GDP contribution from operations rose to \$101.6 million, total employment supported in terms of full-time equivalent (FTE) to 1,202 jobs, and total labour income to more than \$77.1 million (Figure 8).

It is assumed that the majority of the labour income generated by NBCC operations becomes household spending on goods and services around the province. Using average household expenditure data from Statistics Canada, it is estimated that NBCC's payroll and indirect / induced income resulted in more than \$57 million spent on food, shelter, transportation, and other household expenses (2019-20). This amount includes: \$8.3 million

spent in restaurants and grocery stores; \$13.8 million on shelter-related costs such as rent and mortgage payments, homeowner insurance and utilities; \$13.2 million on transportation-related costs, including vehicle purchases and maintenance; nearly \$4.0 million on health and personal care; and \$3.6 million on recreation.

Because of the high GDP multiplier and significant payroll, NBCC operations induced significant tax revenues for government each year. In 2019-20, the economic impact model estimated that NBCC's direct, indirect, and induced economic activity resulted in \$29.2 million in combined tax revenue to the three levels of government. This revenue included personal income taxes, harmonized sales tax (HST), property taxes and other indirect taxes. The Government of New Brunswick and NB municipal governments received an estimated \$19.0 million of these taxes.

Estimating the Economic Impact of International Students (Living Expenses)

NBCC attracts students from outside Canada to its urban and rural campuses. In 2019-20, there were 882 international students enrolled in NBCC programs, some accompanied to Canada by spouses and children. These families have a significant impact on the New Brunswick economy. A 2017 study of international students in Atlantic Canada found that the average student spent \$22,000 per year on living expenses while studying in the region. This spending includes \$6,100 on accommodations, \$3,100 on groceries and supplies, \$1,360 on restaurant meals, and \$2,300 on transportation.

Using these estimates, NBCC international students spent more than \$19.4 million on living expenses during the same period. This spending supported 249 full-time equivalent

jobs and supplied \$10.5 million in labour income while inducing \$3.6 million in tax revenue of which \$2.3 million accrued to provincial and municipal governments.

Combined Economic Impact

Combining the economic impacts of NBCC operations and international student living expenses, the NBCC provincial GDP impact rose to \$114.2 million (2019-20). As well, the labour income supported increased to \$87.6 million, FTE jobs rose to 1,627, household spending exceeded \$76.7 million and tax revenue reached \$32.7 million, of which

\$21.3 million accrued to NB provincial and municipal governments.

NBCC's Economic Impact from R&D Activities

The economic impact of NBCC's research and development activities is part of the operational impacts presented in Figure 8. In 2019-20, NBCC attracted \$1.4 million worth of grant funding associated with 54 different research projects. There were 77 industry / community partners involved, 281 students, and 60 staff.

Figure 8: Economic impact of operations in New Brunswick, NBCC, 2019-20^{9, 10}

INDICATOR	2019-20
Total students	4,355
Out-of-province students	882
Tuition and fees	\$16,993,000
Total expenses (output)	\$87,028,000
Direct economic impact	
Direct employment	1,038
Direct payroll	\$64,663,000
Direct provincial GDP	\$70,667,000
Total economic impact	
Employment (FTE)	1,202
Provincial GDP	\$101,562,000
Labour income	\$77,143,000
Household spending	
Food expenditures	\$8,315,000
Shelter	\$13,824,000
Transportation	\$13,239,000
Health and personal care	\$3,959,000
Recreation	\$3,596,000
Taxation impact	
Total induced tax revenues	\$29,172,000
Relative to GDP contribution	29%
Provincial and municipal government share	\$18,961,000

Figure 8: Economic impact of operations in New Brunswick, NBCC, 2019-20 (con't)

INDICATOR	2019-20
Additional impact of international students living expenses	
Jobs (FTE)	249
Provincial GDP	\$12,631,000
Labour income	\$10,493,000
Household spending	\$19,432,000
Taxes – all levels of government	\$3,556,000
Taxes – provincial and municipal only	\$2,312,000
Total economic impacts (including international student living expenses)	
Jobs (FTE)	1,627
Provincial GDP	\$114,193,000
Labour income	\$87,636,000
Household spending	\$76,730,000
Taxes – all levels of government	\$32,728,000
Taxes – provincial and municipal only	\$21,273,000

Sources: NBCC Internal Data; Stiletto Analysis, 2021

Figure 9: Economic impact of research activities, NBCC¹¹

INDICATOR	VALUE
Jobs (FTE)	22
Total R&D spending	\$1,410,000
Provincial GDP boost	\$1,645,500
Labour income	\$1,249,800
Household spending	\$928,300
Total induced tax revenues	\$472,600
Provincial and municipal government tax revenues only	\$307,200

Source: Stiletto Analysis, 2021

Includes direct, indirect, and induced effects. Note these impacts are included in the total economic impact figures

NBCC's Alumni Economic Impact

Economic Impact of 2019-20 Graduates, 2020

NBCC graduates are trained in specific skills sets and graduates can be employed in many different industries. To complete an assessment of how the 2020 graduates will impact the economy, the graduates by program area were assigned to specific industries. For example, all graduates from tourism-related occupations were assigned

to the accommodation and food service sector; graduates in welding and plumbing were assigned to the construction sector. The full breakdown of graduates by broad industry group is presented in Figure 10.

Using the economic multipliers from Statistics Canada for each of these broad sector groups, an estimated "impact" of NBCC graduates was developed. Income figures were calibrated downward to account for the fact that the new graduates would be at a lower than average income.

Assuming that 2,664 of the 2019-20 NBCC graduates became employed in New Brunswick after graduation in their assigned industries, the economic footprint associated with these graduates is illustrated in Figure 11.

In their first year in the workforce, with indirect and induced effects added, these 2,664 graduates will support an estimated 4,079 full-time equivalent jobs and \$222 million in wages. The GDP supported by these NBCC graduates will be an estimated \$354 million. Household spending induced by the economic activity associated with NBCC graduates will equate to \$165 million and total taxes \$87.5 million.

The estimated taxes for provincial and municipal government will be an estimated \$56.9 million. In other words, in the first full year of contributing to the economy, the 2019-20 NBCC graduates will support economic activity that generates more taxes than the cost of the GNB grant in 2019-20.

Economic Impact of All NBCC Graduates

Using data from the 2016 Census, an estimate can be derived of the economic footprint of all NBCC graduates active in the workforce. Figure 12 illustrates the total college graduates in the New Brunswick workforce by major industry

Figure 10: Estimated 2019 NBCC graduate employment by industry¹²

INDUSTRY GROUP	TOTAL 2019 GRADUATES	90% RETENTION
Accommodation and food services	150	135
Administrative services	244	220
Construction	657	591
Education	255	230
Health care	579	521
Information	617	555
Manufacturing	518	466
Personal services	206	185
Professional services	856	770
Public administration	115	104
Transportation	79	71
Utilities	79	71
Total	4,355	3,920

Source: Stiletto Analysis, 2021
*Based on two-digit NAICS codes

Figure 11: Economic footprint associated with NBCC 2019 graduates, New Brunswick¹³

INDICATOR	YEAR 1
NBCC graduates employed	2,664
Associated total employment (FTE)	4,079
Provincial GDP associated with graduates (with indirect and induced effects)	\$354,000,000
Total labour income	\$222,000,000
Household spending	\$165,000,000
Total induced tax revenues	\$87,500,000
Provincial and municipal government only	\$56,900,000

Source: Stiletto Analysis, 2021
*In 2020 dollars.

group as of 2016. Also using Census 2016 data, the figure also presents the number of college-educated workers who graduated from New Brunswick public colleges. According to Statistics Canada, about 81,685 of the 105,120 college educated workers in New Brunswick graduated from public colleges.¹⁴

The figure also estimates how many of the graduates came from NBCC campuses. Based on several sources, it was estimated that approximately 53,900 graduates (or two-thirds of the number who graduated from New Brunswick colleges) studied at NBCC campuses.^{15, 16}

Multiplying the total college educated workforce with the average employment

income by sector results in the total employment income earned by the NB college-educated workforce. In total, college graduates in the New Brunswick workforce earned \$4.3 billion in 2015. The breakdown by major industry group is offered in Figure 13. Among those college graduates from New Brunswick public colleges, the total employment income earned was \$3.4 billion. Among the estimated number of graduates from NBCC campuses, the total income earned in 2015 was more than \$2.2 billion. It is important to point out that only 54 per cent of college graduates in the New Brunswick workforce are employed full-time and full-year. This data is similar to the college educated workforce nationally.

Figure 12: Estimated number of NBCC graduates in New Brunswick, 2015¹⁷

INDUSTRY	TOTAL COLLEGE GRADUATES IN NB WORKFORCE	GRADUATED FROM NB COLLEGES	ESTIMATED GRADUATES OF NBCC CAMPUSES
College educated workforce: All industries	105,120	81,685	53,912
11 Agriculture, forestry, fishing, and hunting	2,695	2,094	1,382
21 Mining, quarrying, and oil and gas extraction	1,335	1,037	685
22 Utilities	1,230	956	631
23 Construction	7,010	5,447	3,595
31-33 Manufacturing	7,845	6,096	4,023
41 Wholesale trade	3,070	2,386	1,574
44-45 Retail trade	10,190	7,918	5,226
48-49 Transportation and warehousing	4,455	3,462	2,285
51 Information and cultural industries	2,520	1,958	1,292
52 Finance and insurance	4,475	3,477	2,295
53 Real estate and rental and leasing	1,180	917	605
54 Professional, scientific, and technical services	5,895	4,581	3,023
55 Management of companies and enterprises	165	128	85
56 Administrative and support*	5,125	3,982	2,628
61 Educational services	4,940	3,839	2,534
62 Health care and social assistance	21,155	16,439	10,850
71 Arts, entertainment, and recreation	1,355	1,053	695
72 Accommodation and food services	4,500	3,497	2,308
81 Other services (except public administration)	5,630	4,375	2,887
91 Public administration	10,355	8,047	5,311

Source: Statistics Canada, 2016

*includes waste management and remediation services. Derived using Statistics Canada 2016 Census

Figure 13: Total employment income of the college-educated workforce in New Brunswick, 2015^{18, 19}

INDUSTRY	TOTAL COLLEGE GRADUATES IN NB WORKFORCE \$	GRADUATED FROM NB COLLEGES \$	EST. GRADUATES OF NBCC CAMPUSES \$
College educated workforce: All industries	4,306,346,000	3,346,308,000	2,208,563,000
11 Agriculture, forestry, fishing, and hunting	97,362,000	75,657,000	49,933,000
21 Mining, quarrying, and oil and gas extraction	110,822,000	86,116,000	56,837,000
22 Utilities	108,450,000	84,273,000	55,620,000
23 Construction	331,909,000	257,915,000	170,224,000
31-33 Manufacturing	414,506,000	322,098,000	212,585,000
41 Wholesale trade	163,646,000	127,164,000	83,928,000
44-45 Retail trade	299,545,000	232,766,000	153,626,000
48-49 Transportation and warehousing	203,335,000	158,004,000	104,283,000
51 Information and cultural industries	124,354,000	96,631,000	63,777,000
52 Finance and insurance	204,897,000	159,218,000	105,084,000
53 Real estate and rental and leasing	44,540,000	34,611,000	22,843,000
54 Professional, scientific, and technical services	260,936,000	202,764,000	133,824,000
55 Management of companies and enterprises	8,208,000	6,378,000	4,210,000
56 Administrative and support*	153,550,000	119,318,000	78,750,000
61 Educational services	151,406,000	117,652,000	77,650,000
62 Health care and social assistance	754,472,000	586,273,000	386,940,000
71 Arts, entertainment, and recreation	39,929,000	31,028,000	20,478,000
72 Accommodation and food services	94,896,000	73,740,000	48,669,000
81 Other services (except public administration)	160,461,000	124,688,000	82,294,000
91 Public administration	570,126,000	443,024,000	292,396,000

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

*includes waste management and remediation services. Derived using Statistics Canada 2016 Census data

Total Employment Income Premium versus High School

Based on employment data by industry and education level (2016 Census), the average NBCC graduate earns approximately \$10,500 more than the average workforce participant with a high-school diploma. This amount represents the annual premium to achieving a college education versus completing high school. The economic value to the economy from this income premium is significant.

Based on the average employment income by sector, Figure 14 presents the total income premium associated with the college-educated workforce in 2015 compared to if

they only earned the average employment income of high-school graduates.

Across the college-educated workforce, this income premium amounted to \$985 million in 2015. Among those workers who were educated in New Brunswick, the income premium was \$767 million. Among the estimated number that graduated from NBCC campuses, the income premium was \$505 million. Figure 15 illustrates the breakdown by individual industry group.

For example, NBCC graduates working in the health care sector earned \$118 million more per year than if they worked in jobs that paid the average employment income for someone with a high-school diploma.

Figure 14: Total employment income premium associated with the college-educated workforce in New Brunswick compared to the high-school educated workforce^{20, 21}

INDUSTRY	TOTAL COLLEGE GRADUATES IN NB WORKFORCE \$	GRADUATED FROM NB COLLEGES \$	EST. GRADUATES OF NBCC CAMPUSES \$
College educated workforce: All industries	985,317,000	765,655,000	505,332,000
11 Agriculture, forestry, fishing, and hunting	16,658,000	12,944,000	8,543,000
21 Mining, quarrying, and oil and gas extraction	18,814,000	14,620,000	9,649,000
22 Utilities	42,649,000	33,141,000	21,873,000
23 Construction	85,319,000	66,298,000	43,757,000
31-33 Manufacturing	138,794,000	107,852,000	71,182,000
41 Wholesale trade	17,118,000	13,302,000	8,779,000
44-45 Retail trade	40,373,000	31,372,000	20,706,000
48-49 Transportation and warehousing	22,021,000	17,112,000	11,294,000
51 Information and cultural industries	40,166,000	31,212,000	20,600,000
52 Finance and insurance	15,313,000	11,900,000	7,854,000
53 Real estate and rental and leasing	4,156,000	3,229,000	2,131,000
54 Professional, scientific, and technical services	74,418,000	57,828,000	38,166,000
55 Management of companies and enterprises	- 506,000	- 393,000	- 260,000
56 Administrative and support*	33,354,000	25,918,000	17,106,000
61 Educational services	34,496,000	26,806,000	17,692,000
62 Health care and social assistance	229,955,000	178,690,000	117,935,000
71 Arts, entertainment, and recreation	16,837,000	13,084,000	8,635,000
72 Accommodation and food services	19,508,000	15,159,000	10,005,000
81 Other services (except public administration)	29,901,000	23,235,000	15,335,000
91 Public administration	105,973,000	82,348,000	54,350,000

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021
*includes waste management and remediation services

Total Economic Footprint of all NBCC Graduates

Using employment and income statistics combined with Statistics Canada’s economic multipliers, an estimate can be developed of the total economic footprint associated with NBCC graduates. The estimated 53,900 graduates from NBCC who were active in the workforce in 2015 earned \$2.2 billion in employment income. These jobs were associated with total labour income of \$3.2 billion (including indirect and induced impacts) and nearly 70,500 jobs (FTE). In total, NBCC graduates worked in jobs that supported a provincial GDP of \$7.2 billion, or approximately 21 per cent of the total GDP.

Figure 15 presents the breakdown of direct and total employment, income and provincial GDP associated with all NBCC graduates in the workforce.

A detailed analysis of the taxes generated by sector is beyond the scope of this report. The GNB generates its own source tax revenue relative to GDP at a rate of approximately 17.5 per cent. Assuming this tax to GDP ratio holds for the economic activity associated with NBCC graduates, the annual taxes supported by NBCC graduates in New Brunswick would amount to \$1.25 billion.

Figure 15: Total economic footprint of all NBCC graduates in the New Brunswick workforce^{22, 23}

INDUSTRY	DIRECT LABOUR INCOME (\$M)	TOTAL LABOUR INCOME (\$M)*	EMPLOYMENT (FTE)*	PROVINCIAL GDP BOOST (\$M)
College educated workforce: All industries	\$2,208.6	\$3,218.8	70,447	\$7,165.3
11 Agriculture, forestry, fishing, and hunting	\$49.9	\$81.6	2,264	\$251.0
21 Mining, quarrying, and oil and gas extraction	\$56.8	\$73.2	850	\$214.5
22 Utilities	\$55.6	\$82.7	1,245	\$331.4
23 Construction	\$170.2	\$246.4	4,731	\$572.7
31-33 Manufacturing	\$212.6	\$394.4	7,121	\$709.9
41 Wholesale trade	\$83.9	\$116.7	2,061	\$298.0
44-45 Retail trade	\$153.6	\$210.6	5,744	\$495.4
48-49 Transportation and warehousing	\$104.3	\$175.3	3,608	\$385.8
51 Information and cultural industries	\$63.8	\$88.1	1,810	\$325.3
52 Finance and insurance	\$105.1	\$202.4	4,437	\$283.4
53 Real estate and rental and leasing	\$22.8	\$44.0	1,170	\$61.6
54 Professional, scientific, and technical services	\$133.8	\$171.4	3,725	\$337.4
55 Management of companies and enterprises	\$4.2	\$5.4	104	\$10.6
56 Administrative and support**	\$78.8	\$109.6	3,048	\$255.8
61 Educational services	\$77.7	\$105.5	2,860	\$217.4
62 Health care and social assistance	\$386.9	\$490.1	11,599	\$1,003.7
71 Arts, entertainment, and recreation	\$20.5	\$43.5	1,111	\$159.2
72 Accommodation and food services	\$48.7	\$64.9	2,339	\$141.0
81 Other services (except public administration)	\$82.3	\$106.6	2,952	\$208.0
91 Public administration	\$292.4	\$406.5	7,670	\$903.2

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

*with indirect and induced effects.

**includes waste management and remediation services. Derived using Statistics Canada 2016 Census

ROI FROM 2019-20 GRADUATES: TAXPAYER PERSPECTIVE

Incremental Tax-Based ROI on Taxpayer Investment Into NBCC

NBCC is a critical catalyst for the talent needed to support New Brunswick's economy – particularly for strategic, export-oriented industries. This rationale is routinely presented for support of significant public investment in the college. When quantified, economic data reveal the extent of the long-term value of NBCC investment to both the graduate and the government. Economic impact is based on a series of assumptions and demonstrates the magnitude of college graduate benefits to the government. It is not a predictor of the ultimate benefits as revealed over time.

The 2016 Census revealed that community college graduates earned a median income that was \$11,200 higher than those with a high-school education. The Census also reported that of the 97,125 people in the labour market across Canada who graduated from community colleges in New Brunswick, 81,685 were living and working in New Brunswick (equal to a retention rate of 84%).²⁴ Assuming the medium income premium and retention rate holds for 2019-20 graduates, the incremental tax revenues associated with the graduates can be developed.

Long-Term Taxpayer ROI on College Education

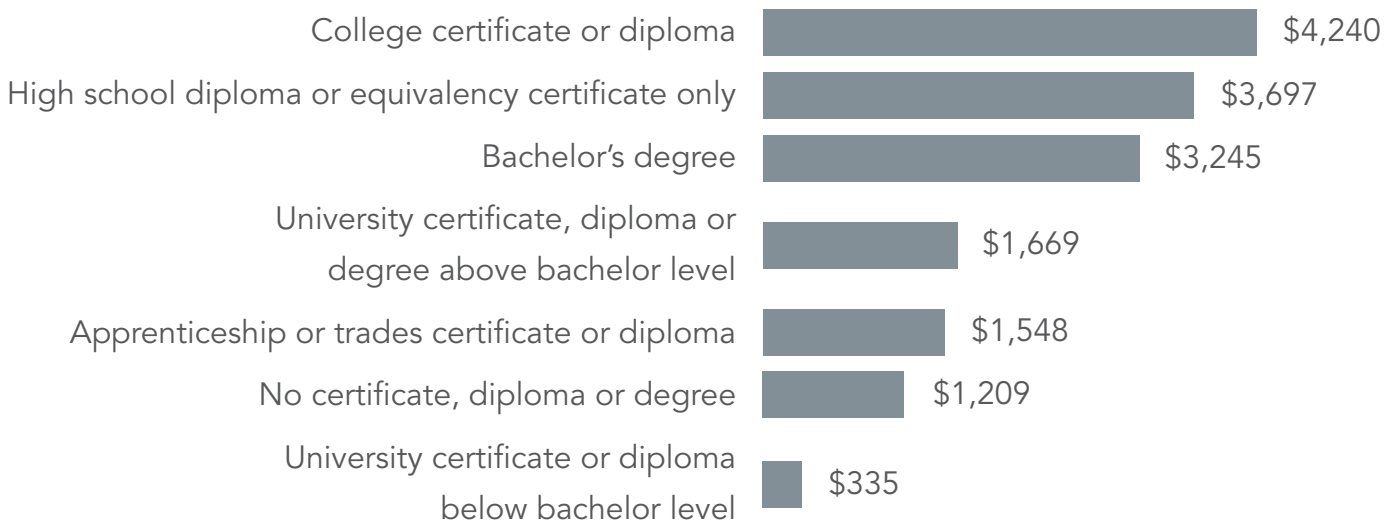
Income Generated by College Graduates

The community college system in New Brunswick has been a primary contributor to the provincial workforce. There are 126 college graduates in the population for every 100 university graduates (2016).²⁵ The structure of the New Brunswick economy has favoured college education, and the outlook for the future continues to provide a dominant role for colleges (*NBCC Alumni Impact: Perspective*, page 24).

As of the 2016 Census, there were 107,480 NB college graduates with employment income. Given the high retention rates (NB community college graduates tend to stay in the province), it is assumed that most of these workers graduated from New Brunswick-based community colleges. The average employment income for all the workers with a college diploma or certificate was \$10,545 higher (36%) than the average employment income for those with a high-school diploma.

The total annual employment income of the college graduates at the time of the Census was \$4.24 billion, or 27 per cent of all employment income in 2015. This employment income was more than the employment income for workers with a high-school diploma (\$3.7 billion), a bachelor's degree (\$3.2 billion), any post-graduate education above the bachelor's level (\$1.7 billion) or some form of apprenticeship or trades certificate (\$1.6 billion).

Figure 16: Estimated total employment income earned in New Brunswick by education level (\$millions), 2015²⁶

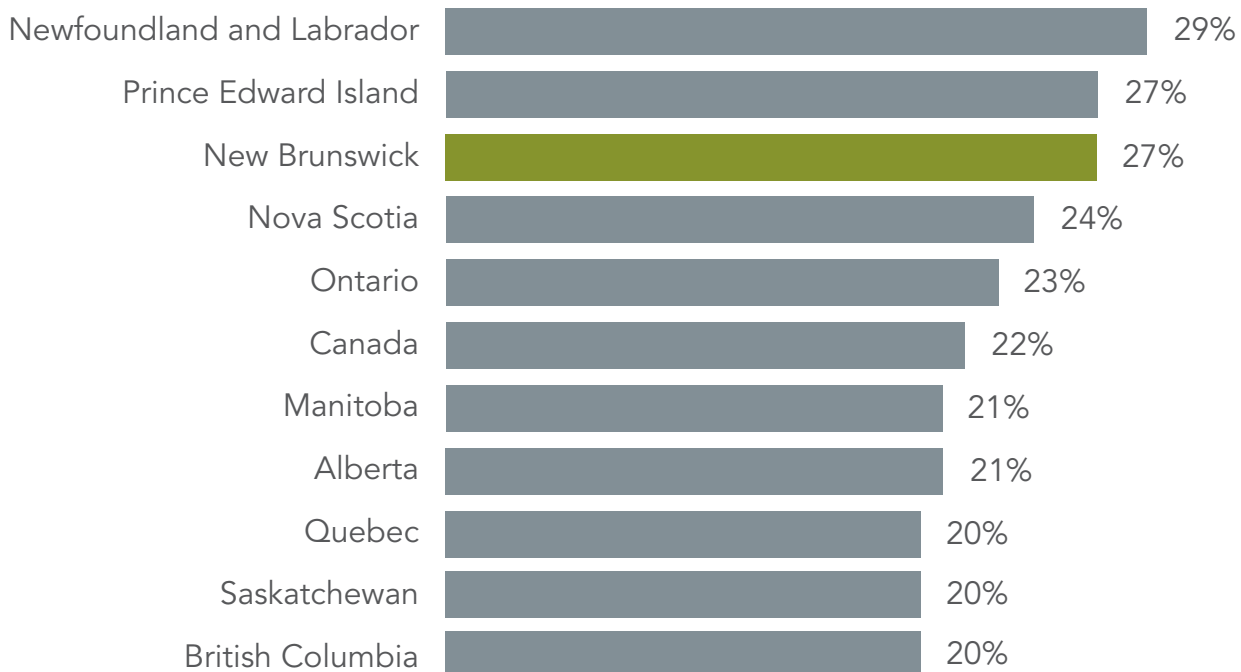


Source: Statistics Canada, 2016

College graduates in New Brunswick earn 27 per cent of all employment income (earned by all workers), which is higher than all provinces except Newfoundland and Labrador, and well above the Canadian

average (Figure 17). New Brunswick is tied with Prince Edward Island for the second largest share of total employment income contributed by college graduates.

Figure 17: Total employment income earned by college graduates as a share of all employment income, 2016²⁷



Source: Statistics Canada, 2016

The Taxpayer ROI on College Education Compared to High School

The average college graduate in New Brunswick earned 36 per cent more than the average high-school graduate with no additional PSE credentials. That differential translated into an additional \$1.13 billion of employment income for college graduates (2015).

Adding an estimate of personal income taxes paid, HST, property taxes, and other taxes on personal income, college graduates conservatively contributed more than \$200 million to provincial and municipal governments in 2015; this amount is more than if they were high-school graduates earning the average employment income of college graduates.

Taxpayer ROI on the Class of 2019-20

Figure 18 compares two student scenarios:

- Scenario 1: The estimated incremental taxes generated for the GNB from the labour income generated for the next 20 years by NBCC graduates in 2019-20; and
- Scenario 2: The estimated incremental taxes generated for the GNB from the labour income generated for the next 20 years if those same graduates did not study at NBCC and remained in the workforce with a high-school education (at average wages).

To develop this analysis, the graduates from various programs were assigned to specific industries and the economic multipliers for those industries were used. For simplicity, all dollar amounts are in 2020 values. Two assumptions were made: that the GNB grant was \$55.4 million, and the taxes generated during the year from NBCC operations and the living expenses associated with out-of-province students amounted to \$21.3 million.

As a result, during the next 20 years, the 2,664 college graduates that continued their education (2,960 graduates with an assumed 90% retention rate) will generate approximately \$242 million more in tax revenue associated with their wages compared to high-school graduates who did not continue their education (in 2020 dollars).

The government can expect to generate \$263 million in direct tax revenue from NBCC operations in 2019-20 plus the current value of incremental tax revenue during the next 20 years from the wage premium college graduates earn compared to high-school graduates.

Based on the model, for every dollar in tax revenue contributed through the grant to NBCC in 2019-20, a total of \$4.76 in tax revenue will be generated during the 20-year period. The investment just in NBCC's 2019-20 graduates will generate \$208 million worth of incremental tax revenue (after 'paying back' the GNB grant of \$55.4 million) that will be used to fund other government services and infrastructure.

The breakeven point is 5.2 years. Adding the taxes induced from NBCC operations in 2019-20 with the incremental taxes paid by NBCC 2019-20 graduates, it will take slightly more than five years to reach the point at which the incremental taxes generated exceed the GNB grant.

Of course, this model reveals the economic impact of NBCC very simply. It does not estimate the indirect and induced taxes that would arise from the direct wage premium of college graduates versus high-school graduates. It also does not consider the strategic value of NBCC and the college

education system in New Brunswick. As will be disclosed in the “NBCC Alumni Impact: Perspective” section (page 24), the college has been critical to the education of the workforce in many of the province’s strategic, export-focused industries.

Figure 18: Incremental tax-based ROI from the GNB grant to NBCC, 2019-20^{28, 29}

INDICATOR	VALUE
2019-20 grant from province (\$000s)	\$55,368
Induced tax revenue from NBCC operations in 2019-20 (\$000s)*	\$21,273
Estimated incremental tax revenue paid by 2019-20 NBCC graduates during the next 20 years (2020\$, \$000s)	\$242,050
Total 20-year taxes as a result of the GNB investment in NBCC (2020\$)	\$263,323
Return on the GNB investment (\$000)	\$207,956
Return on the GNB investment – for every dollar of the 2019-20 grant	\$4.76
Breakeven point (years)	5.2

Sources: NBCC Internal Data; Stiletto Analysis, 2021

* Estimated incremental taxes associated with community college graduates versus high-school graduates

ROI FROM 2019-20 GRADUATES: STUDENT PERSPECTIVE

Based on 2016 Census employment income statistics, the average college graduate can expect to earn around \$10,500 more per year compared to high-school graduates. A domestic student attending college will spend approximately \$22,000 per year on tuition, fees, and living expenses. In addition, students forego employment income while in school. The amount of income foregone is not zero as many students work part-time or work in the summer months. The example in Figure 19 assumes the average NBCC student would earn an average of \$700 per month from part-time / summer employment.

Based on these assumptions, Figure 19 provides an example of the ROI for NBCC students. For example, a student will pay approximately \$44,000 in tuition, fees, and living expenses for two years at NBCC and will forego \$32,000 in income that they could have earned had they worked at a job not requiring post-secondary education (net of

employment income earned through part-time / summer employment).

In a typical 40-year career, community college graduates will earn an incremental \$420,000 (2020 dollars) compared to someone who did not attend post-secondary education (assuming high-school graduation). As a result, the return on the student's investment in their NBCC education equals an income premium during 40 years of \$344,000 (2020 dollars) or an ROI of \$5.53. That is, for every dollar invested in their college education (tuition, fees, living expenses, and net wage losses), they will receive \$5.53 in incremental income over their 40-year career.

Another way to look at this scenario is that the average college graduate will recover the investment in their two-year program within 7.2 years of graduation.

Figure 19: Example student ROI, college education, two-year diploma program³⁰

INDICATOR	VALUE
Total tuition and living expenses	\$44,000
Forgone wage income	\$32,000
Total cost of education and foregone income	\$76,000
Total incremental employment income over a 40-year career (2020\$)	\$420,000
Return on college education	\$5.53
Average payback period on college education	7.2 years

Source: Stiletto Analysis, 2021

Assumptions: The average NBCC student will work part-time or summer employment while in school so the forgone wages are not zero. Total tuition and living expenses are based on a domestic student with accommodation expenses

NBCC ALUMNI IMPACT: PERSPECTIVE

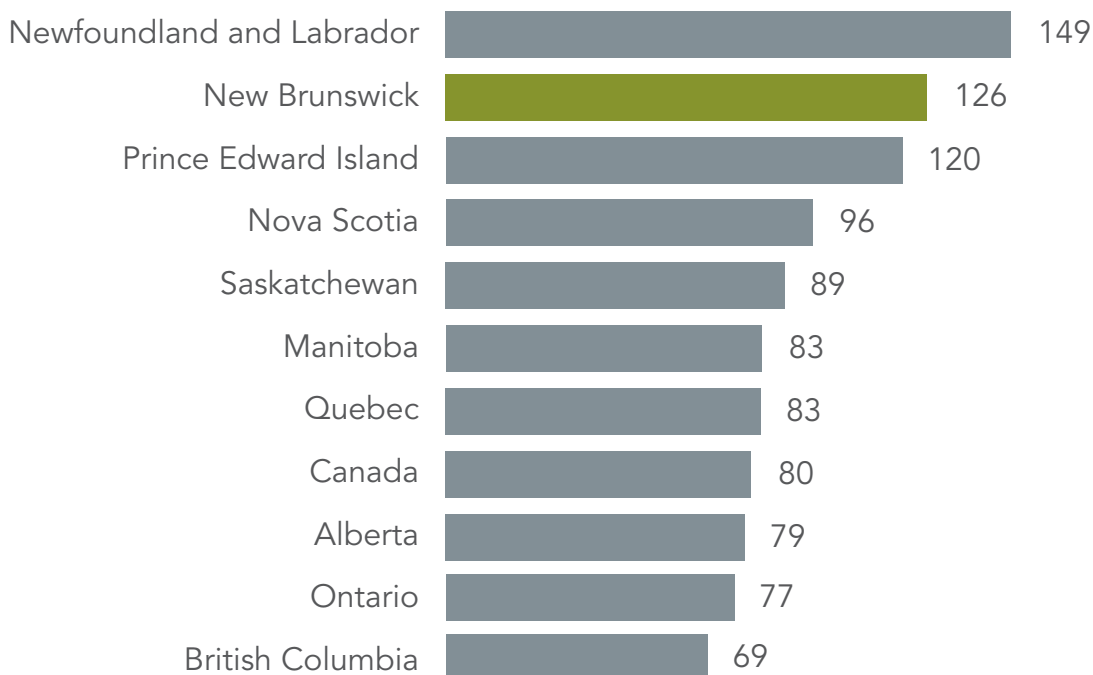
The greatest economic impact of NBCC stems from the combined added human capital – the knowledge, creativity, imagination, and entrepreneurship – found in its alumni. NBCC alumni also share a deep commitment to improving society and giving back through charitable donations, board service, and volunteerism at the local and global level.

This section looks at the broader impacts of the NB college educated workforce and specific impact of NBCC graduates.

The New Brunswick Workforce is Heavily Reliant on College Education

Three provinces in Canada have more college graduates in the adult population than university graduates. Only one other province in Canada relies more on its community college system than does New Brunswick (Figure 20). In New Brunswick, there are 126 college graduates for every 100 university graduates. This situation is mainly due to structure of the provincial economy – in New Brunswick there are more industries and occupations that rely on college-level training.

Figure 20: Number of community college graduates per 100 university graduates, Canada³¹



Source: Statistics Canada, 2016

College Graduates Earn a Significant Income Premium

In the 2016 Census, community college graduates in New Brunswick reported an average employment income 36 per cent higher than those with a high-school diploma (i.e., those with no other formal post-secondary education). This income translates into more household spending around the province and more tax revenue for governments.

College Graduates Stay in New Brunswick

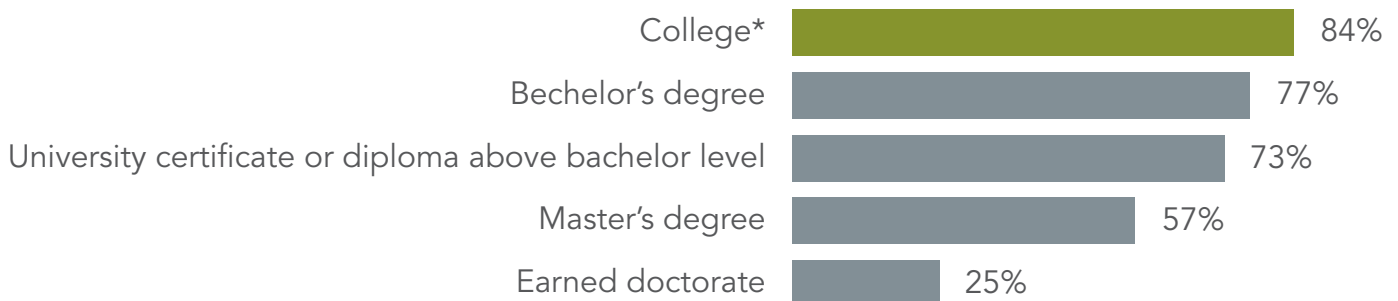
New Brunswick has a strong track record of retaining its college graduates. In the 2016 Census, Statistics Canada reported that of the 97,125 people in the Canadian labour market who graduated from community colleges in New Brunswick, 81,685 were living and working in New Brunswick (a retention rate of 84%).³³

As illustrated in Figure 21, this retention rate was well above most other types / levels of education. Persons with trades certificates also had an 84 per cent retention rate. In recent years, the New Brunswick Community College has had a greater than 90 per cent graduate retention rates in the province. For NBCC, the retention rate in 2019 is now even higher at 94 per cent.³⁴

The College Sector is a Growing Source of Export Revenue

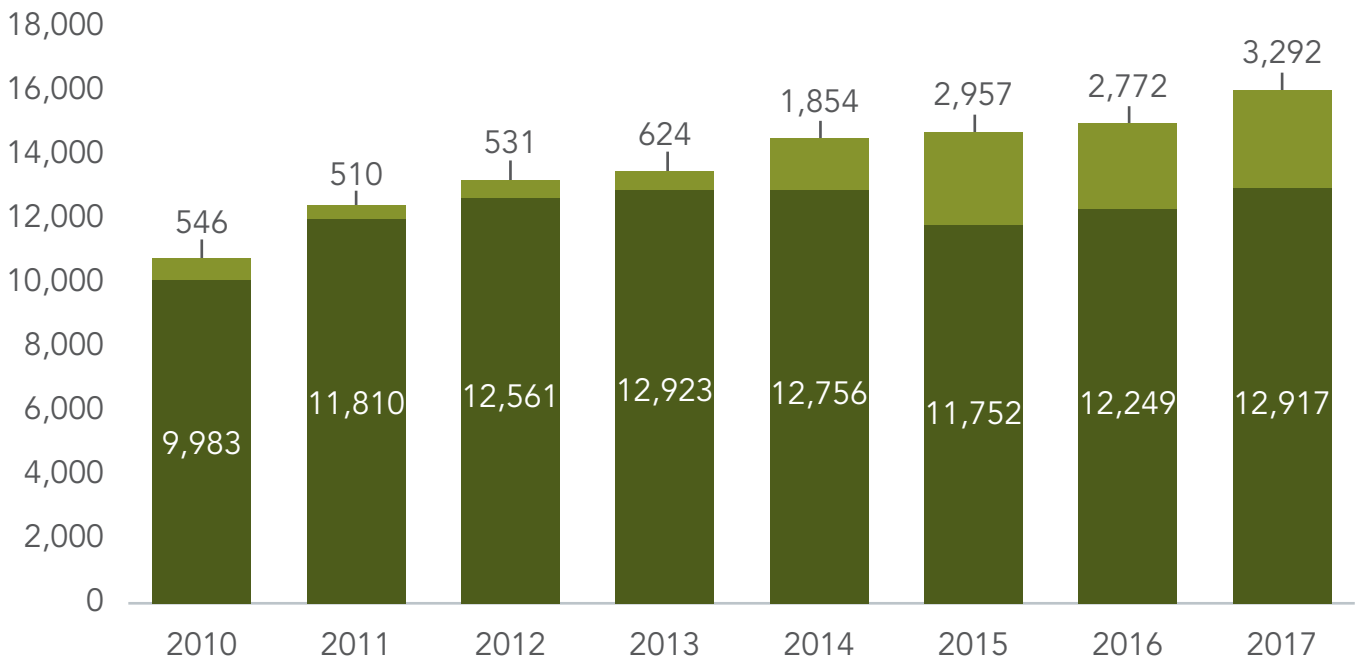
In 2017, the New Brunswick community college sector generated more than \$16 million per year in export revenue (interprovincial and international). This amount was up by nearly 60 per cent since 2010 (Figure 22). This revenue comes from tuition and related fees paid by out-of-province and international students.

Figure 21: Graduate retention rates by type / level of post-secondary education, New Brunswick³²



Source: Statistics Canada, 2016
*and other non-university certificates or diplomas

Figure 21: Community college sector, export revenue, New Brunswick, 2010-17, (\$thousands)³⁵



Source: Statistics Canada, Table 36-10-0595-01
 Tuition and related fees for colleges. Does not include other sources of export revenue such as out-of-province R&D funding or out-of-province student living expenses

Supporting New Brunswick’s Strategic Export-Focused Sectors

New Brunswick has a number of strategically important, export-focused industries. These industries are important because they bring revenue into the province to pay for locally produced goods and services. Most of New Brunswick’s export-focused industries have a higher concentration of college graduates compared to other sources of post-secondary education. Figures 23 through 26 illustrates a selected group of export-focused industries for which college education is the dominant source of post-secondary education.

Information and Communications Technology Sector

New Brunswick’s ICT sector is strategically important and, in recent years, has been growing its GDP and exports. Only Newfoundland and Labrador’s ICT sector relies more on the college education sector than does New Brunswick.

Forest Products Sector

New Brunswick has the largest forest products industry in Canada relative to the size of its economy. It is a top employer and the second largest export sector.

Figure 23: Summary of New Brunswick’s information and communications technology sector^{36, 37}

INDICATOR	DETAILS
Value of interprovincial and international exports (2017)	\$350 million
Total workforce	7,500+
Per cent of the workforce who are college educated	40% (2nd highest rate among 10 provinces)
Ratio of college to university graduates	111 college grads per 100 university grads
Per cent workforce 55 or older	24%

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

Figure 24: Summary of New Brunswick’s forest products sector^{38, 39}

INDICATOR	DETAILS
Value of interprovincial and international exports (2017)	\$2.7 billion
Total workforce	11,000+
Per cent of the workforce who are college educated	25% (2nd highest rate among 10 provinces)
Ratio of college to university graduates	2,100 college grads per 100 university grads
Per cent workforce 55 or older	30%

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

Business and Office Administration Services Sector

New Brunswick has the largest business and office administration export sector among the 10 provinces in Canada. It is one of the province’s top export sectors. People from across Canada and beyond book hotel and airline reservations, get help with their computers and telephone services, address insurance claims and engage in other customer service activities by connecting with NB workers.

Petroleum Products Sector

The oil refinery in Saint John is the largest in Canada and accounts for 75 per cent of the country’s gasoline exports to the United States. Combined with a large petroleum wholesale and support industry, there are more than 2,500 people working in the sector across New Brunswick.

Figure 25: Summary of New Brunswick’s business and office administration services sector^{40, 41}

INDICATOR	DETAILS
Value of interprovincial and international exports (2017)	\$1.4 billion
Total workforce	18,000+
Per cent of the workforce who are college educated	26% (2nd highest rate among 10 provinces)
Ratio of college to university graduates	243 college grads per 100 university grads
Per cent workforce 55 or older	26%

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

Figure 26: Summary of New Brunswick’s petroleum products sector^{42, 43}

INDICATOR	DETAILS
Value of interprovincial and international exports (2017)	\$8.5 billion
Total workforce	2,500+ (including wholesale activities)
Per cent of the workforce who are college educated	37% (2nd highest rate among 10 provinces)
Ratio of college to university graduates	1,200 college grads per 100 university grads
Per cent workforce 55 or older	23%

Sources: Statistics Canada, 2016; Stiletto Analysis, 2021

New Brunswick Workforce is Third Most Reliant on College Education

The importance of college education in New Brunswick cuts across many sectors of the economy. When compared to the other provinces, New Brunswick ranks third among the 10 for the concentration of adults with community college education, behind only Newfoundland and Labrador and Prince Edward Island. For 10 of the major occupational groups (as identified as two-digit National Occupational Classification codes or NOC), New Brunswick ranks second among the 10 provinces for the concentration of population with a college education.

In absolute terms, the college sector is the dominant provider of post-secondary

education for more than 30 two-digit NOC occupational groups – more than universities and more than trades-related training. For example, in the technical occupations within the health care group, 68 per cent of the workforce in New Brunswick has a college diploma – more than four times than the university-educated workforce. The finance, insurance, and related business administrative occupations workforce in New Brunswick has a 41 per cent college education rate. Nearly twice as many workers have a college diploma as have a university degree.

Figure 28 presents some occupational groups with a high concentration of college educated workers and the comparison to the university educated workforce in those occupational groups.

Figure 27: List of two-digit NOC occupations for which New Brunswick ranks second among 10 provinces for the intensity of college-education workforce⁴⁴

NOC	OCCUPATIONAL GROUP
11	Professional occupations in business and finance
22	Technical occupations related to natural and applied sciences
32	Technical occupations in health
13	Finance, insurance, and related business administrative occupations
15	Distribution, tracking, and scheduling co-ordination occupations
44	Care providers and educational, legal, and public protection support occupations
72	Industrial, electrical, and construction trades
73	Maintenance and equipment operation trades
92	Processing, manufacturing, and utilities supervisors and central control operators
95	Assemblers in manufacturing

Source: Statistics Canada, 2016

Figure 28: Selected occupational groups with a high concentration of college graduates, New Brunswick⁴⁵

OCCUPATIONAL GROUP (TWO-DIGIT NOC)	COLLEGE EDUCATED %	COLLEGE GRADS PER 100 UNIVERSITY GRADS
22 Technical occupations related to natural and applied sciences	52	313
32 Technical occupations in health	68	409
42 Paraprofessional occupations in legal, social, community and education services	42	161
12 Administrative and financial supervisors and administrative occupations	44	233
13 Finance, insurance, and related business administrative occupations	41	196
14 Office support occupations	41	282
34 Assisting occupations in support of health services	43	729
44 Care providers and educational, legal, and public protection support occupations	38	412
73 Maintenance and equipment operation trades	34	1,606
92 Processing, manufacturing and utilities supervisors and central control operators	39	456

Source: Statistics Canada, 2016

Figure 29 illustrates a select group of occupations for which New Brunswick has a far higher concentration of college graduates compared to the country overall. Twenty-eight out of every 100 workers in industrial, electrical, and construction trades in New Brunswick have a community college education (28 per cent of the total). The workforce in this occupational group has 57 per cent more college graduates when compared to the country overall.

The dominance of college education extends beyond the trades. Among professional occupations in business and finance, more than one-in-four have a college diploma – 45 per cent higher than the share across the country.

Figure 29: Occupations with a high concentration of college graduates in New Brunswick relative to the country overall (% higher share compared to national level)⁴⁶



Source: Statistics Canada, 2016

*For example, 28 out of every 100 workers in industrial, electrical, and construction trades in New Brunswick have a community college education. That number is 57 per cent more than the country overall (18 out of every 100 workers)

FORECASTING NBCC IMPACTS THROUGH 2040

Growing NBCC's Economic Impact

New Brunswick Community College will play an important role in the years ahead as a key part of the workforce talent pipeline. This section estimates the impacts of NBCC across the next 20 years (2039-40).

Economic Impact from NBCC Operations Through 2039-40

As discussed previously, NBCC is significant employer in its own right. The school employs more than a thousand people (full-, part-time, and casual) in six communities across the province. In addition, a significant share of its revenue comes from non-government sources, meaning the economic impact is much greater compared to government spending without additional leveraged funding.

Further, NBCC has been increasing its international student enrolment which also amplifies the college's economic impact as the students end up spending millions of dollars per year on living expenses while enrolled.

Based on a number of assumptions, the economic impact of NBCC's operational spending across the next 20 years has been estimated. These assumptions include:

- **Continuing education employment forecast:** NBCC provided the total learners, total students in continuing education and international student estimates through 2023-24. From 2024-25 onward, forecasts for total learners and students in

continuing education were estimated to grow by two per cent per year.

- **International students:** Numbers of international students were estimated to increase as a share of the total students in continuing education from an estimated 20 per cent in 2019-20 to 31 per cent (2029-30) and 34 per cent (2039-40).
- **Tuition and fees and total expenses:** NBCC provided the forecast through 2023-24. From 2024-25 and onward, tuition, fees, and total expenses are estimated to rise correlated to the number of total learners.
- **Direct employment provided by NBCC:** Forecasted direct employment growth was assumed relative to growth in the number of learners.
- **Multipliers:** GDP, indirect / induced multipliers, tax, household spending and other multipliers were derived using the model developed in the Economic Impact Model (Appendix I).
- **International student international living expenses:** Estimates were taken from a 2017 study by Gardner Pinfold on international student expenses in Atlantic Canada.⁴⁷
- **Dollars:** Expressed in 2020 dollars.

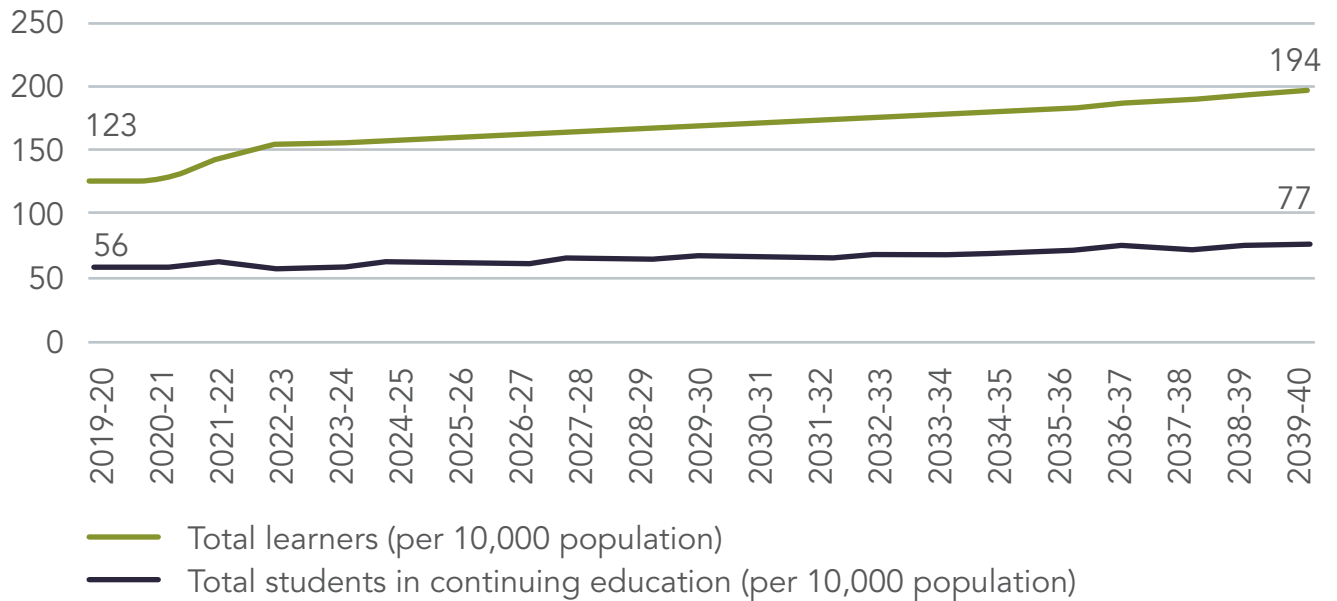
The forecast assumes a modest pace in the increase of total learners and students in continuing education year-to-year through 2039-40. The model forecasts the number of total learners will rise to around 12,000 by 2022-23, then increase by two per cent per year through 2039-40 (for a total of 16,473 by 2029-40). The number of students in continuing education (a subset of total learners) will rise throughout the period as well (two per cent per year after 2023-24) with an increasing share coming from outside Canada. The assumption is that NBCC will enrol more international students as the total number of immigrants settling in the province continues to rise.

Figure 30 illustrates the forecasted number of students relative to the projected New Brunswick population through 2039-40. It is important to note that even Statistics Canada's high population growth scenario only assumes an annual 0.5 per cent population growth rate through 2040. To raise economic growth back to the two per cent per year level and to ensure the workforce has enough talent, it is likely the population growth rate will need to be above one per cent per year through 2040.

Based on these assumptions, Figure 31 illustrates the economic forecasts for NBCC operational spending from the 2019-20 baseline year through 2024-25, 2029-30, and 2039-40. The model includes both the economic impact from NBCC operations and the living expenses of international students.

- The model estimates that NBCC's annual operational expenditures will rise from \$87.0 million (2019-20) to \$109.1 million (2029-30) and \$133.0 million (2039-40).
- The direct employment by NBCC will increase from 1,038 (2019-20) to 1,106 in 10 years and 1,222 in 20 years.
- The provincial GDP contribution arising from NBCC operations and international student living expenses will climb from an estimated \$114.2 million (2019-20) to \$150.0 million (2029-30) and \$182.9 million (2039-40).
- The total jobs supported by NBCC in New Brunswick, from direct, indirect, and induced effects, will grow from 1,627 (2019-20) to 1,909 (2029-30) and 2,159 (2039-40).
- The total taxes induced by NBCC operations in New Brunswick will increase from an estimated \$32.7 million (2019-20) to \$40.7 million (2029-30) and \$46.7 million (2039-40).
- Provincial and municipal government tax revenue will rise from an estimated \$21.3 million (2019-20) to \$26.4 million (2029-30) and \$30.4 million (2039-40).

Figure 30: Forecasted total learners and continuing education students per 10,000 population, NBCC, 2019-20 through 2039-40⁴⁸



Source: Stiletto Analysis, 2021
 *Based on Statistics Canada's high population growth scenario through 2040.

Figure 31: Projected growth and economic footprint, NBCC, 2019-20 through 2039-40 (\$millions)^{49, 50}

INDICATOR	FORECAST			
	ACTUAL 2019-20	YEAR 5 2024-25	YEAR 10 2029-30	YEAR 20 2039-40
Total learners	9,531	12,000	13,514	16,473
Total students in continuing education	4,355	4,757	5,357	6,530
International students in continuing education	882	1,100	1,561	1,902
Direct employment (FT and PT)	1,038	1,042	1,106	1,222
Tuition and fees	\$17.0	\$20.4	\$23.3	\$28.4
Total expenses (output)	\$87.0	\$95.5	\$109.1	\$133.0
Direct payroll	\$64.7	\$68.9	\$74.2	\$82.0
Direct provincial GDP	\$70.7	\$77.5	\$88.6	\$108.0
Total economic impact				
Employment (FTE)	1,377	1,383	1,468	1,622
Provincial GDP	\$101.6	\$111.4	\$127.3	\$155.2
Labour income	\$77.1	\$82.2	\$88.6	\$97.8
Household spending				
Food expenditures	\$8.3	\$8.9	\$9.5	\$10.5
Shelter	\$13.8	\$14.7	\$15.9	\$17.5
Transportation	\$13.2	\$14.1	\$15.2	\$16.8
Health and personal care	\$4.0	\$4.2	\$4.5	\$5.0
Recreation	\$3.6	\$3.8	\$4.1	\$4.6

Figure 31: Projected growth and economic footprint, NBCC, 2019-20 through 2039-40 (\$millions) (con't)

INDICATOR	FORECAST			
	ACTUAL 2019-20	YEAR 5 2024-25	YEAR 10 2029-30	YEAR 20 2039-40
Taxation				
Total induced tax revenues	\$29.2	\$31.3	\$34.3	\$38.9
Provincial and municipal government only	\$19.0	\$20.4	\$22.3	\$25.3
Additional impact of international students				
Jobs	249	311	441	537
Provincial GDP	\$12.6	\$15.8	\$22.7	\$27.7
Labour income	\$10.5	\$13.1	\$18.8	\$23.0
Household spending	\$19.4	\$24.2	\$34.9	\$42.5
Total induced tax revenues	\$3.6	\$4.4	\$6.4	\$7.8
Provincial and municipal government only	\$2.3	\$2.9	\$4.2	\$5.1
Total economic impacts				
Jobs	1,627	1,694	1,909	2,159
Provincial GDP	\$114.2	\$127.1	\$150.0	\$182.9
Labour income	\$87.6	\$95.3	\$107.4	\$120.8
Household spending	\$76.7	\$85.3	\$100.7	\$115.2
Total induced tax revenues	\$32.7	\$35.8	\$40.7	\$46.7
Provincial and municipal government only	\$21.3	\$23.2	\$26.4	\$30.4

Sources: NBCC Internal Data, 2019; Stiletto Analysis, 2021

Economic Impact of NBCC Graduates Through 2039-40

NBCC has the potential to play an even more important role in workforce development in the years ahead. Figure 32 assesses the potential economic impacts from growing the NBCC graduate population by the current forecast through 2024-25 and by two per cent per year after that through 2039-40. As discussed, this amount would increase the relative share of the population studying at NBCC but that is consistent with a long-term trend towards increased post-secondary education among the population.

In the coming years, high-growth industries will be more reliant on post-secondary education. Many of the occupations associated with these industries have a workforce with a higher share of college than university graduates

(as developed further in the “NBCC Alumni Impact: Perspective” section).

Based on a number of assumptions, the economic impact of NBCC’s graduates across the next 20 years has been estimated. These assumptions include:

- **Continuing education graduate employment forecast:** NBCC’s 2019-20 graduates increasing by two per cent per year after that through 2039-40.
- **Graduate distribution:** The distribution of graduates by occupation and industry were estimated to remain relatively consistent with the current mix.
- **Workforce retention:** A 90 per cent retention rate in the workforce of NBCC graduates throughout the 20-year period was forecasted.

- **Multipliers:** The economic and tax multipliers were estimated to remain the same throughout the 20-year period.
- **Dollars:** Expressed in 2020 dollars.

Based on these assumptions, the annual economic impact of new NBCC graduates would rise substantially across the 20-year period. The provincial GDP impact associated with annual NBCC graduates would rise from \$354 million (2019-20) to \$432 million (2029-30) and to \$526 million (2039-40). The annual employment supported by new graduates would rise from 4,079 today to 4,972 (2029-30) and 6,061 (2039-40). Annual labour income associated with new graduates in that year would rise to \$270 million (2039-40) and \$330 million (2040). The annual provincial / municipal taxes associated with NBCC graduates in the

specific year after graduation will rise from \$57 million today to \$85 million in 2039-40.

The figure also displays the cumulative economic impacts. If there is a 90 per cent retention rate, there would be more than 68,000 NBCC graduates in the workforce by 2040 (among those who graduated in 2019-20 onward). The cumulative economic activity supported by these workers would be considerable. Between 2019-20 and 2039-40, all NBCC graduates throughout the period will induce the following cumulative economic effects (in 2020 dollars):

- \$5.8 billion in labour income;
- \$4.3 billion in household spending; and,
- \$1.5 billion in provincial / municipal government tax revenue.

Figure 32: Economic contribution of NBCC graduates, \$millions, 2020^{51, 52}

INDICATOR	FORECAST			
	ACTUAL 2019-20	YEAR 5 2024-25	YEAR 10 2029-30	YEAR 20 2039-40
Annual impacts				
Total continuing education graduates	2,960	3,268	3,608	4,398
Graduate retention in New Brunswick (@ 90%)	2,664	2,941	3,247	3,959
Total employment supported (FTE)*	4,079	4,503	4,972	6,061
Provincial GDP associated with graduates*	\$354.1	\$391.0	\$431.7	\$526.2
Total labour income*	\$221.8	\$244.9	\$270.4	\$329.6
Household spending*	\$164.8	\$181.9	\$200.8	\$244.8
Taxes induced: Provincial and municipal government only*	\$56.9	\$62.8	\$69.3	\$84.5
Cumulative impacts				
Cumulative 2019-20 to 2039-40 NBCC graduates in the workforce (assumes long term retention rate of 90%)	2,664	16,805	32,417	68,687
Cumulative labour income supported (\$millions)*	\$221.8	\$1,416.9	\$2,736.4	\$5,801.7
Cumulative household spending supported (\$millions)*	\$164.8	\$1,052.4	\$2,032.5	\$4,309.2
Cumulative Provincial and municipal government taxes induced by NBCC graduates (\$millions)*	\$56.9	\$363.3	\$701.7	\$1,487.8

Sources: NBCC Internal Data, 2019; Stiletto Analysis, 2021
*includes indirect and induced effects

NBCC and Education for In-Demand Occupations

In the years ahead, NBCC is well positioned to increase its role developing New Brunswick’s workforce talent pipeline.

Forecasted In-Demand Occupations are College Education-Intensive

According to a forecast developed for the New Brunswick Department of Post-Secondary Education, Training and Labour (PETL), there will be more than 120,000 jobs needing to be filled in New Brunswick between 2018 and 2028. Note that this forecast is based on a weak economic outlook throughout the period. The GNB is focused on boosting GDP growth from its current level of around 0.5 per cent per year (since 2007) to an annual average of two per cent per year. If that growth level is achieved, it will require tens of thousands of more workers in the labour market.

Having said that, the 120,000 jobs identified in the forecast are skewed towards occupations that require college-level education.⁵³ Of the 140 three-digit NOC occupations in the forecast, 61 have a current workforce with at least 25 per cent college graduates. Sixty-eight per cent of these 140 occupations have a higher concentration of college graduates than university graduates.

Figure 33 illustrates the top 25 occupations in highest demand through 2028 as measured by total job openings and the share of workers in those occupations by education level (2016 Census). These 25 occupations alone represent more than 50 per cent of all job openings through 2028. All but four of the 25 occupations in highest demand have a larger share of college graduates in the current workforce compared of university graduates.

An example of the role of the college system in New Brunswick involves occupations related to administrative services. According to the forecast, there will be nearly 15,000 job openings between 2018-28 in administrative services roles (NOCs 121-145). From the 2016 Census, more than 40 per cent of people working in these roles had a community college education. Assuming a similar college education rate for the job openings results in nearly 6,000 job openings in administrative services across the 10-year period.

Another example is health care. Of the nearly 7,000 job openings in technology-related jobs,⁵⁴ 55 per cent will require college education, if the current level of college graduates remains consistent.

Figure 33: Top 25 three-digit NOC occupations in demand through 2028 by educational attainment profile, New Brunswick^{55, 56}

OCCUPATION	COLLEGE GRADUATES %	UNIVERSITY GRADUATES %
001 Legislators and senior management	17	53
062 Retail and wholesale trade managers	22	16
111 Auditors, accountants, and investment professionals	26	58
122 Administrative and regulatory occupations	38	28
124 Office administrative assistants – general, legal, and medical	51	10

Figure 33: Top 25 three-digit NOC occupations in demand through 2028 by educational attainment profile, New Brunswick (con't)

OCCUPATION	% COLLEGE GRADUATES	% UNIVERSITY GRADUATES
141 General office workers	39	10
143 Financial, insurance, and related administrative support workers	46	18
152 Supply chain logistics, tracking, and scheduling co-ordination occupations	25	8
301 Professional occupations in nursing	28	61
323 Other technical occupations in health care	79	8
341 Assisting occupations in support of health services	43	6
403 Secondary and elementary school teachers and educational counsellors	2	96
421 Paraprofessional occupations in legal, social, community, and education	42	26
441 Home care providers and educational support occupations	35	9
632 Chefs and cooks	18	5
642 Retail salespersons	18	8
655 Customer and information services representatives	33	12
661 Cashiers	13	4
671 Food counter attendants, kitchen helpers, and related occupations	10	3
673 Cleaners	15	3
724 Electrical trades and electrical power line and telecom. workers	39	3
732 Automotive service technicians	33	1
751 Motor vehicle and transit drivers	13	2
761 Trades helpers and labourers	12	2
961 Labourers in processing, manufacturing, and utilities	12	2

Sources: Government of New Brunswick, 2020; Statistics Canada, 2016
Share of workforce by education attainment level as of the 2016 Census

NBCC Educating the Workforce for Future Strategic Industries

The GNB’s generic occupational forecast has been used in this report to illustrate the importance of the college system during the next decade. Through 2028, there will be considerably a greater number of jobs required that typically require a college level education than a university education. The previous section also explains how the college system has been particularly important to strategic export-focused industries (e.g., ICT, business services, and manufacturing).

By 2040, it will be important for NBCC to help the workforce adapt to new occupations and skills and to be educated for strategically important industries.

Examples:

- New Brunswick is focused on growing its cybersecurity workforce. Will NBCC expand its current cybersecurity academic offerings?
- New Brunswick would like to see more young entrepreneurs creating new businesses and replacing business owners as the retire. Will NBCC make additional partnerships and increase applied research to help generate new business start-ups?

- The evolution of the health care has been accelerated by the COVID-19 pandemic. NBCC is a major source of talent for health care and graduates. Will NBCC expand its current academic offerings to include new public health, geriatric / long-term care, and digital health competencies?
- Automation and artificial intelligence will replace certain tasks and require new skills. Will NBCC investigate technical applications for the heavily impacted sectors of retail, transportation, and business services?

Training International Students: Conduit for Immigration

New Brunswick attracted a record 6,000 new permanent residents in 2019 – more than doubling the number from just five years ago. By 2024, the provincial government is committed to boosting annual numbers to at least 7,800 per year. It is likely the province will need to push through 10,000 newcomers per year by the middle of the decade, especially with the increasing number of workforce exits each year, the declining domestic population, and the desire to bring the province back to at least a moderate level of growth.⁵⁷

One of the best ways to bring in newcomers is through the college system. Many international students already have some post-secondary education in their home countries. Taking a one- or two-year course at NBCC will give them Canadian education, work experience, improved occupation-specific language skills, and time to get acclimated to a new community, culture, and climate.

International students are important in other ways, too. They pay a higher rate of tuition

than domestic students and they spend more money in the province on living and related expenses (pages 11-12).

NBCC had an international student population of 882 in 2019-20 or an amount equivalent to 15 per cent of the total permanent residents (PRs) admitted to the province that year.⁵⁸ Figure 34 demonstrates what the level of international students would need to be to maintain that 15 per cent ratio to 2027-28. Based on a realistic forecast of PR admission through 2027-28, NBCC international enrolments will rise to 1,500 per year by 2026-27 to maintain the 15 per cent ratio.

Reskilling New Brunswick's Active Senior Population

In addition to international students, another source of workers in the years ahead will be New Brunswick retirees who are possibly looking to earn income in more part-time or seasonal roles. Those older workers who have been laid off as a result of the COVID-19 pandemic will also be looking for jobs in today's ever-evolving workplace.

For example, by 2030 there will be an estimated 170,000 people living in the province between the ages of 60-74, nearly 50 per cent more than in 2010 and 2.1 times as many as in 1990 (Figure 35). For these groups, skills training is the most appropriate intervention to transition them into high-skill, demand occupations and build their technological competence and confidence.

Figure 34: Historical and forecasted international students relative to permanent resident (PR) attraction, NBCC⁵⁹

YEAR	NBCC INTERNATIONAL STUDENTS	PRS ADMITTED TO NEW BRUNSWICK	INTERNATIONAL STUDENTS TO ANNUAL PR ADMISSIONS RATIO (%)
2017-18*	241	3,650	7
2018-19*	485	4,610	11
2019-20*	882	6,000	15
2020-21**	807	4,000	20
2021-22**	647	6,500	10
2022-23*	1,000	7,000	14
2023-24*	1,100	7,500	15
2024-25	1,275	8,500	15
2025-26	1,425	9,500	15
2026-27	1,500	10,000	15
2027-28	1,500	10,000	15

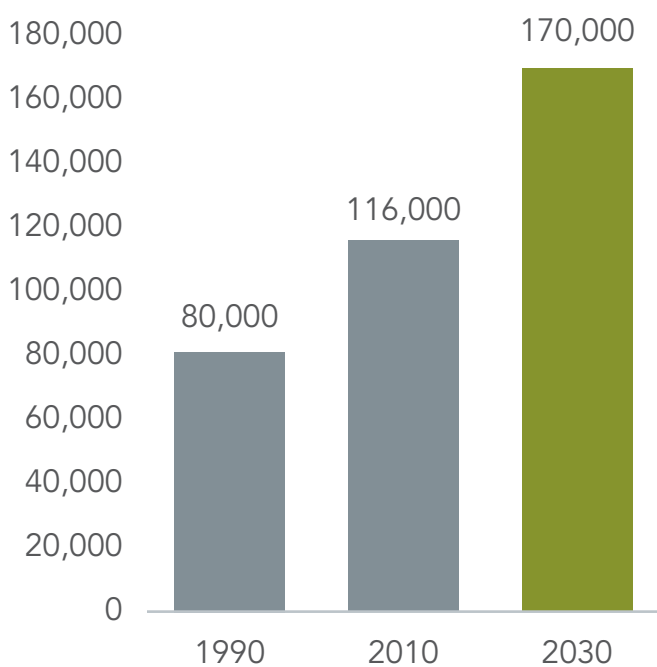
Source: Stiletto Analysis, 2021

*Provided by NBCC⁶⁰

**Estimate based on impact of COVID-19

Permanent residents admitted to New Brunswick through 2020-21 – Source: IRCC. Future permanent resident estimates based on the provincial government's target through 2024 and an estimate of additional growth after 2024

Figure 35: Population aged 60-74 in New Brunswick by year, 2030 forecast⁶¹



Source: Statistics Canada, Tables 17-10-0005-01 and 17-10-0057-01

Economic Potential of Reskilling New Brunswick's Active Senior Workforce

The economic potential to both NBCC and the provincial economy from reskilling the active senior workforce could be significant. For New Brunswick to reach the national level of workforce participation among the population 60 and older, another 10,000 people in that cohort would need to be active in the workforce. To reach the labour market participation rate of Alberta or Saskatchewan among the 60 and older population would require more than 20,000 in that age group to be active in the workforce.

Assume NBCC will train (through micro-credentialling or certifications) around 17,000 of these older New Brunswick in the next 15 years or so. At an average cost of training of \$5,000, this amount would represent a revenue of \$85 million to the college and support 1,345 FTE person years of employment (direct,

indirect, and induced). More importantly, if these 17,000 retrained workers stay active in the labour market for an additional three years (at a level 50 per cent of a full time /

full year worker), it could boost labour income by \$1.1 billion and provincial / municipal tax revenue by more than \$246 million.

Figure 36: Economic impact of reskilling New Brunswick’s 60 and older workforce⁶²

INDICATOR	VALUE
Target audience (those aged 60-74 through 2030)	170,000
Assume NBCC can provide training to 10% to ensure their participation in the workforce	17,000
Average cost of training	\$5,000
Total revenue to NBCC (\$million)	\$85.0
Economic impact from training activity:	
Person years of employment (FTE)	1,345
Provincial GDP (\$million)	\$99.2
Labour income (\$million)	\$75.3
Economic impact from the reskilling: Assume it keeps 17,000 in the workforce for an average of 3 more years working an average of 0.5 FTE	
Additional person years of employment	25,500
Average employment income*	\$42,000
Total income boost to the economy	\$1.1 billion
Provincial and municipal tax revenue	\$246 million

Source: Stiletto Analysis, 2021

*This income is lower than the overall average employment income because the expectation is that many of these second career jobs would be in sectors such as personal services, tourism, et. which provide more flexibility

Reskilling Displaced Workforces

Every decade brings significant workforce disruption in New Brunswick. In the 1970s and 1980s, there were thousands employed in New Brunswick in the rail transportation sector. In the 1990s, more than 20,000 jobs were added in the back office / call centre sector in New Brunswick. There are predictions, however, that the next 20 years will bring unprecedented change to the provincial workforce as new artificial intelligence and automation / robotics revolutions take hold.

Displaced Workers at Risk

Figure 37 presents an example of how many jobs in New Brunswick could be at risk. It breaks down the workforce by industry in New Brunswick (2020) and then makes an estimate of how many of the jobs could be at risk from artificial intelligence / automation / robotics. The examples are based on studies undertaken by OECD and only meant to indicate the potential impact in New Brunswick (i.e., this example is not a formal estimate of expected job losses).⁶³

The largest sectors at risk of significant job losses from artificial intelligence / automation / robotics include the transportation sector (driverless vehicles), business services (automatic customer interaction), food services (automated service), and retail trade (automated shopping). Manufacturing is also expected to be heavily impacted by industrial robotics, with McKinsey estimating the industrial robotics global marketplace at \$48 billion USD (2017).⁶⁴ Figure 37 indicates that some 120,000 jobs in New Brunswick could be at risk.

Figure 37: An example of the number of jobs that could be at risk from AI and automation, New Brunswick⁶⁵

INDUSTRY	2020 WORKFORCE	AT RISK %	POTENTIALLY AT RISK
Agriculture	6,200	20	1,240
Forestry and logging and support activities for forestry	5,500	20	1,100
Fishing	3,000	20	600
Mining, quarrying	3,500	20	700
Utilities	3,600	40	1,440
Construction	28,400	20	5,680
Manufacturing	32,800	50	16,400
Wholesale and retail trade	58,900	50	29,450
Transportation and warehousing	18,100	80	14,480
Finance and insurance	12,800	30	3,840
Real estate and rental and leasing	4,200	30	1,260
Professional, scientific, and technical services	18,100	20	3,620
Business, building and other support services	16,500	50	8,250
Educational services	28,900	20	5,780
Health care and social assistance	60,100	20	12,020
Information, culture, and recreation	11,800	20	2,360
Accommodation and food services	22,300	30	6,690
Other services (except public administration)	14,500	10	1,450
Public administration	28,000	10	2,800
Unclassified industries	7,800	20	1,560
Total, all industries	385,000		120,720

Source: Workforce numbers taken from Statistics Canada Table: 14-10-0023-01

Economic Potential of Reskilling the Displaced Workforce

During the next 20 years, the economy will also create a lot of new jobs in technology-based industries and services that cannot be easily automated. Ensuring job retraining / reskilling those who lose their jobs through AI / automation will be an important public policy goal. NBCC is well positioned to help with that transition.

Figure 38 presents an example of how NBCC training for those who are displaced could positively impact the economy. If the college provides significant retraining

for 12,000 displaced workers at a cost of \$10,000 per person, this scenario will result in \$120 million in revenue for the college. This training would boost provincial GDP by \$140 million, support 1,899 person years of employment (FTE) and generate \$106 million in labour income. Further, if this training keeps the 12,000 in the workforce an average of 10 more years, it will boost total employment income by \$6.2 billion and induce \$1.4 billion in provincial and municipal tax revenue.

Figure 38: Economic impact of reskilling the displaced workforce⁶⁶

INDICATOR	VALUE
Target audience (displaced workers)	120,000
Training 10%	12,000
Average cost of training	\$10,000
Total revenue to NBCC (\$million)	\$120.0
Economic impact from training:	
Person years of employment (FTE)	1,899
Provincial GDP (\$million)	\$140.0
Labour income (\$million)	\$106.4
Economic impact from the reskilling: Assume it keeps 17,000 in the workforce for an average of 3 more years working an average of 0.5 FTE	
Additional person years of employment	120,000
Average employment income*	\$52,000
Total income supported throughout the economy	\$6.2 billion
Provincial and municipal tax revenue	\$1.4 billion

Source: Stiletto Analysis, 2021

APPENDIX I: THE ECONOMIC MODEL

The Economic Impact Model

The economic impact model is based on Statistics Canada’s Input-Output (I-O) tables. These tables provide a detailed profile of how sector expenditures flow through the provincial and national economy as well as through international trade. These I-O tables are developed using actual spending patterns within specific industries and provinces. Estimates of new economic activity are based on the previous expenditure profile within those industries.

The economic impact model evaluates the direct, indirect, and induced economic impacts of NBCC’s annual operating expenditures using the following parameters:

- **Direct impacts** measure the value added to the economy that is attributed directly from the employees, the wages earned, and the revenues generated by NBCC operations.
- **Indirect impacts** measure the added value generated within the New Brunswick and national economies through organizational demand for intermediate inputs or other support services (e.g., the supply chain).
- **Induced impacts** are derived when employees in these firms spend their earnings and owners spend their profits. These purchases lead to more employment, higher wages, and increased income and tax revenues felt across a wide range of industries.

The I-O tables trace the impact of economic activity (output shock) on the provincial and national economies (including imports and exports). In addition to the output, GDP, and employment impacts, the economic impact model estimates the amount of tax revenue generated by the industry as well as consumer spending impacts.

Figure 39: The economic impact model⁶⁷

DIRECT EFFECT WITHIN PROVINCE (WHERE AVAILABLE)	SIMPLE MULTIPLIERS (DIRECT AND INDIRECT) WITHIN PROVINCE AND REST OF CANADA	TOTAL MULTIPLIERS (DIRECT, INDIRECT, AND INDUCED) WITHIN PROVINCE AND REST OF CANADA
<ul style="list-style-type: none"> • Output • GDP basic price • Labour income • Jobs • International imports • Export shares 	<ul style="list-style-type: none"> • Output • GDP basic price • Labour income • Jobs • International imports 	<ul style="list-style-type: none"> • Output • GDP basic price • Labour income • Jobs • International imports

Source: Jupia Consultants Inc.

There are more than 200 industries for which detailed I-O data is available. For this project, multipliers for the Input-Output Industry Classification (IOIC) “Community Colleges and C.E.G.E.P.s” [GS611200] were used.

Inclusions

The following economic impact analysis covers a broad range of factors to illustrate the role of NBCC and the community college system in New Brunswick. These include:

- The economic impact of NBCC operations.
- The economic impact of NBCC research activities.
- The economic impact of out-of-province / international student spending in New Brunswick.
- The return on the GNB investment in NBCC using taxes induced from the operations / research / out-of-province student spending, as well as an estimate of the tax revenue generated across the next 20 years by the 4,400 diploma graduates in 2019-20.

Forecasting

The impact analysis also includes a 20-year projection that will quantify the forward-looking benefits to New Brunswick from NBCC, including:

- Economic impacts.
- Role supporting immigration.
- Role supporting mature learners.
- Role supporting R&D moving forward.
- Role supporting entrepreneurship.
- Role addressing social challenges.

ENDNOTES

All hyperlinks within have been validated as of the date of this research report.

- 1 Stiletto Analysis, 2021
- 2 Stiletto Analysis, 2021
- 3 NBCC Internal Data: Total Learners, Institutional Employment, 2019-20
- 4 Stiletto Analysis, 2021
- 5 Vicinity Jobs, 2020
- 6 Input-output Multipliers, Provincial and Territorial, Detail Level," Statistics Canada, 2017,
- 7 NBCC Internal Data: Revenue streams, 2019-20
- 8 "2020 Personal Tax Calculator," EY, <https://www.eytaxcalculators.com/en/2020-personal-tax-calculator.html>
- 9 NBCC Internal Data: Revenue Streams, 2020
- 10 Stiletto Analysis, 2021
- 11 Stiletto Analysis, 2021
- 12 Stiletto Analysis, 2021
- 13 Stiletto Analysis, 2021
- 14 Graduates from private colleges are classified elsewhere.
- 15 "New Brunswick Community College," Colleges & Institutes Canada, n.d., <https://www.collegesinstitutes.ca/members/new-brunswick-community-college/>
- 16 "Census Profile, 2016 Census," Statistics Canada, 2016, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=13&Geo2=&Code2=&Data=Count&SearchText=New%20Brunswick&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=13>
- 17 "Census Profile, 2016 Census," Statistics Canada, 2016, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=13&Geo2=&Code2=&Data=Count&SearchText=New%20Brunswick&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=13>
- 18 "Census Profile, 2016 Census," Statistics Canada, 2016, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=13&Geo2=&Code2=&Data=Count&SearchText=New%20Brunswick&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=13>
- 19 Stiletto Analysis, 2021
- 20 "Census Profile, 2016 Census," Statistics Canada, 2016, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=13&Geo2=&Code2=&Data=Count&SearchText=New%20Brunswick&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=13>
- 21 Stiletto Analysis, 2021
- 22 "Census Profile, 2016 Census," Statistics Canada, 2016, <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?Lang=E&Geo1=PR&Code1=13&Geo2=&Code2=&Data=Count&SearchText=New%20Brunswick&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=13>
- 23 Stiletto Analysis, 2021
- 24 Excludes those who are working outside Canada.
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