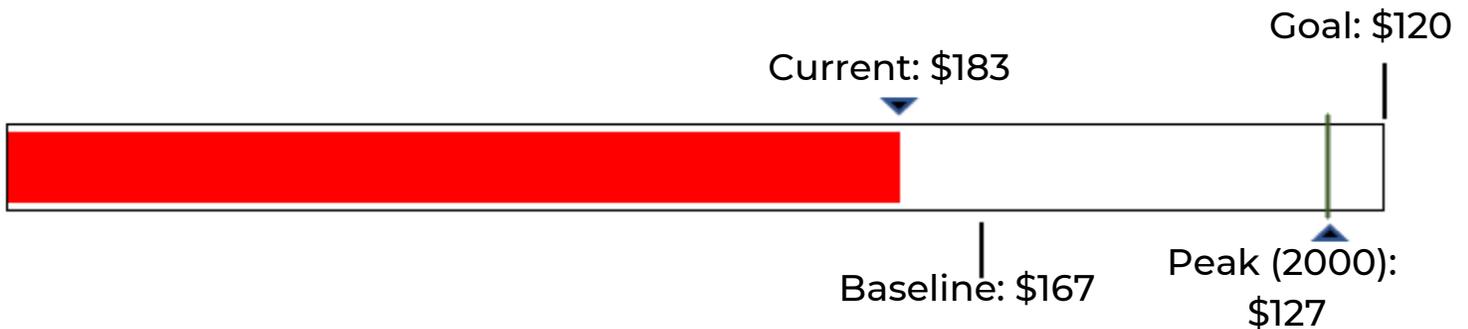




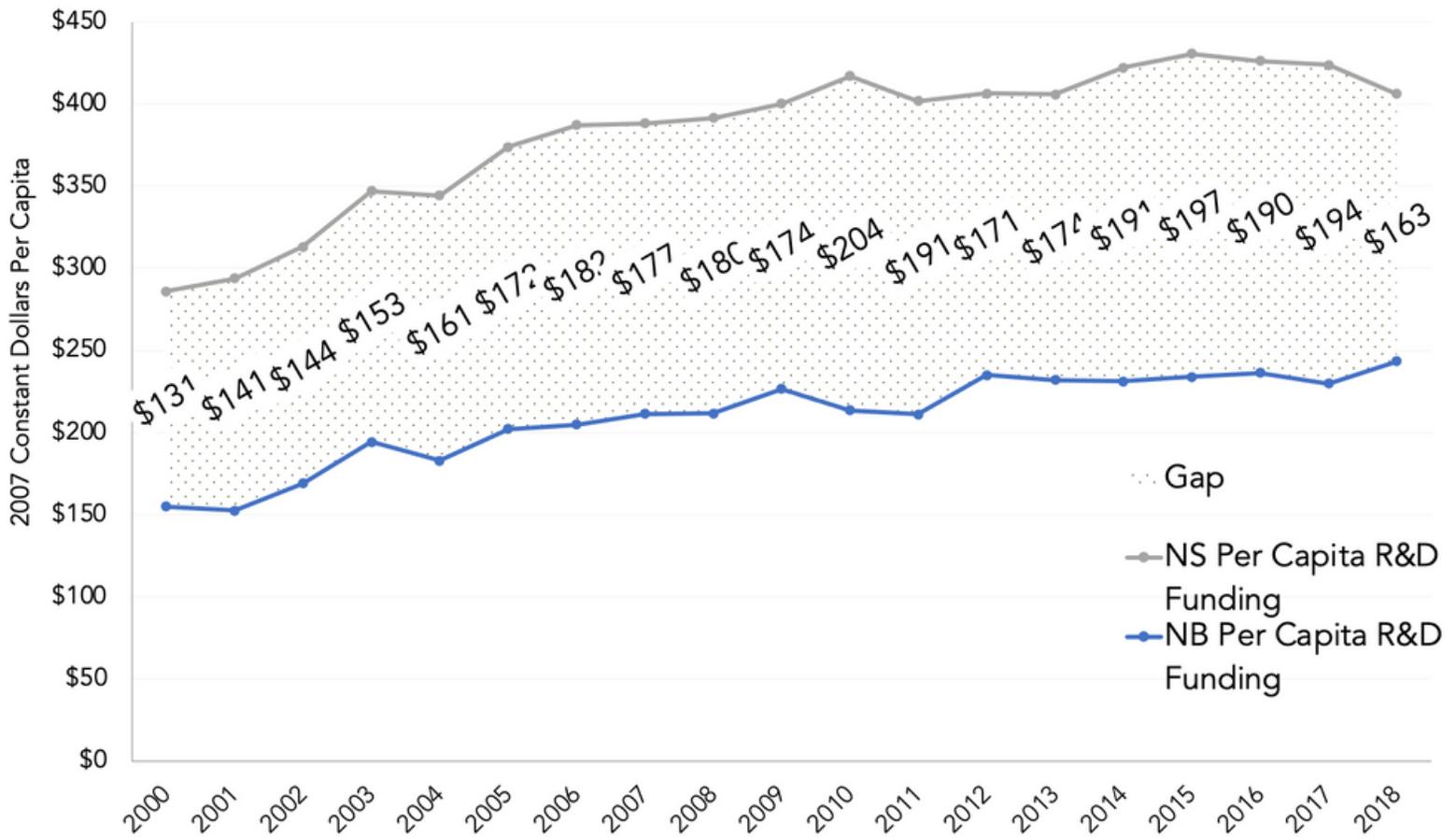
POST-SECONDARY EDUCATION RESEARCH AND DEVELOPMENT

STATUS:  NOT PROGRESSING



New Brunswick will close the gap in funding levels for post-secondary education and research and development between itself and Nova Scotia by 28% from its baseline value to \$120 per capita (2012 chained dollars) by 2028.

Figure 1: Per Capita Funding for Post-Secondary Education R&D in New Brunswick and Nova Scotia (2012 Constant Dollars)



(See full data in Appendix A)

HIGHLIGHTS

- R & D Funding for universities in New Brunswick has mostly been less than the funding provided to universities in Nova Scotia.
- New Brunswick's higher education sector has a lower per capita R&D value than the national average.
- In 2019/2020, 62.3% of New Brunswick's R&D funding went to the Natural Sciences and Engineering sector.
- Over half of the funding for R&D activities in New Brunswick comes from the higher education sector.

OVERVIEW

Importance

New Brunswick's higher education sector has a lower per capita Research and Development (R&D) value than the national average. R&D encourages collaboration between private enterprises and post-secondary institutions and attracts students and researchers alike. New Brunswick lacks Business research and development (BERD) with most Gross expenditure from research and development (GERD) coming from Higher education expenditure on research and development (HERD). With the lack of both BERD and HERD, it is important to focus on R&D within the post-secondary education sector, as there is hope that increasing research and development here could create productivity spillovers to the province's industries, in turn attracting Business R&D with industrial partnerships at universities.

Problem

R&D for universities in New Brunswick peaked in 2009 at \$72 million (2012 constant dollars). Since then, it has fallen by 14% to \$62 million in 2021. The gap between current R&D funding and the target is beginning to decrease. If New Brunswick adopts the same goal as OneNS (with a 2009 baseline of \$72 million), it should aim to increase research funding for New Brunswick universities to \$144 million by the year 2028.

Cause

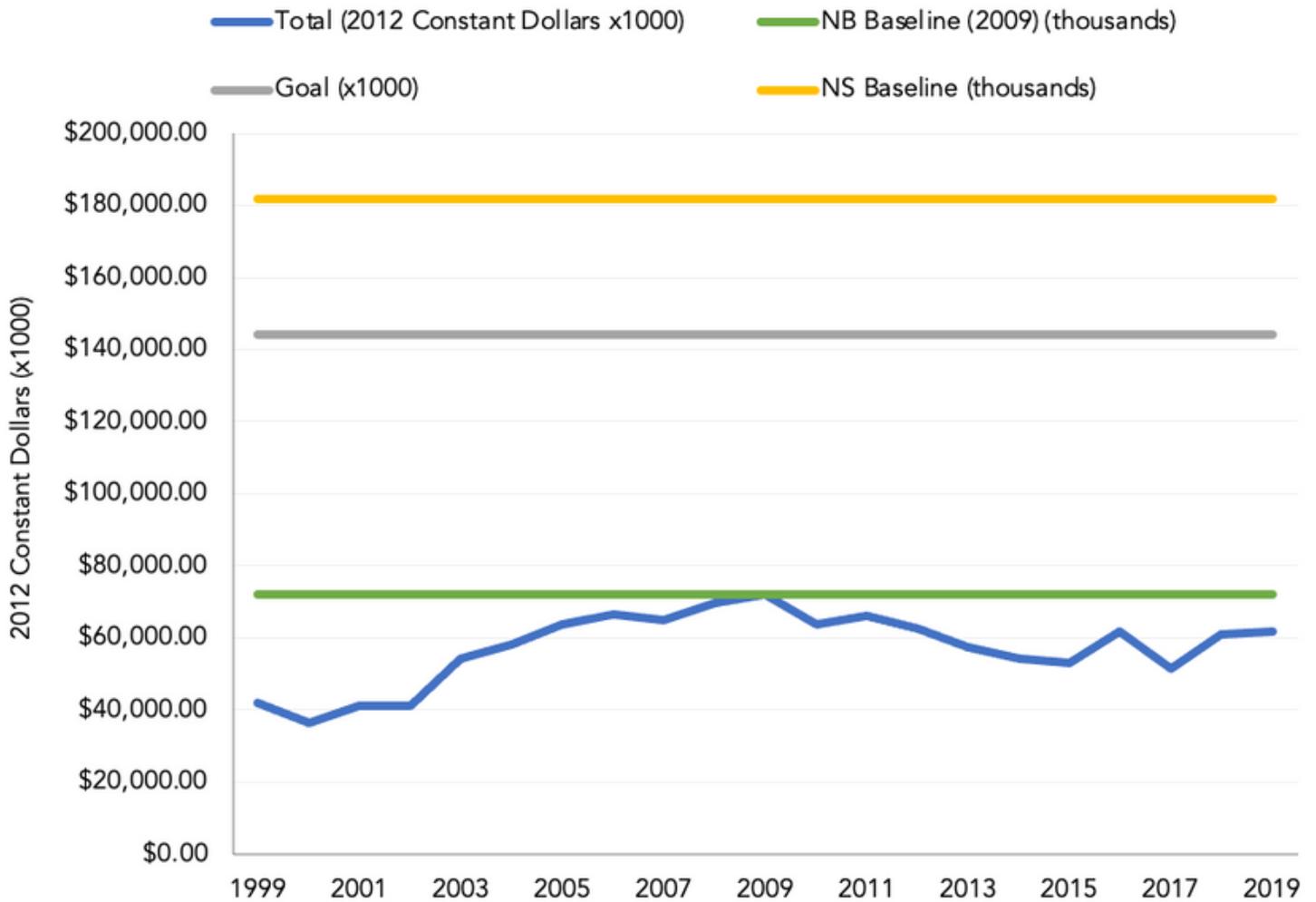
According to a report by the Council of Canadian Academies, federal R&D capacity is concentrated in Toronto, Montreal, Vancouver, Ottawa, and Calgary. These five cities create patents and high-tech companies at twice the rate of other Canadian cities. New Brunswick does not boast as many research opportunities as these places, hence, the decline in the federal government and business enterprise funding. Unlike cities in New Brunswick, the five cities mentioned above also house numerous medical schools which compels the federal government for funding research in these schools as the research conducted in medical schools are considered necessary and essential

IN THE NUMBERS

R&D Funding Gap

As shown in Figure 2, R&D funding for universities in New Brunswick steadily increased from 2002 to 2009, at which point it started to fall. It appeared to rebound from 2015 to 2016 but then fell again, further increasing the gap in post-secondary R&D funding between New Brunswick and Nova Scotia. The sharp dip from 2016 to 2017 is largely due to a decline in funding from the category of “Non-Government grants and contracts - Business Enterprises” (around \$11.1 million in 2016 to \$4.9 million in 2017). The province has since seen another increase back toward 2016 numbers in 2018, however, the recent growth in 2019 has been marginal relative to the funding amount in 2018.

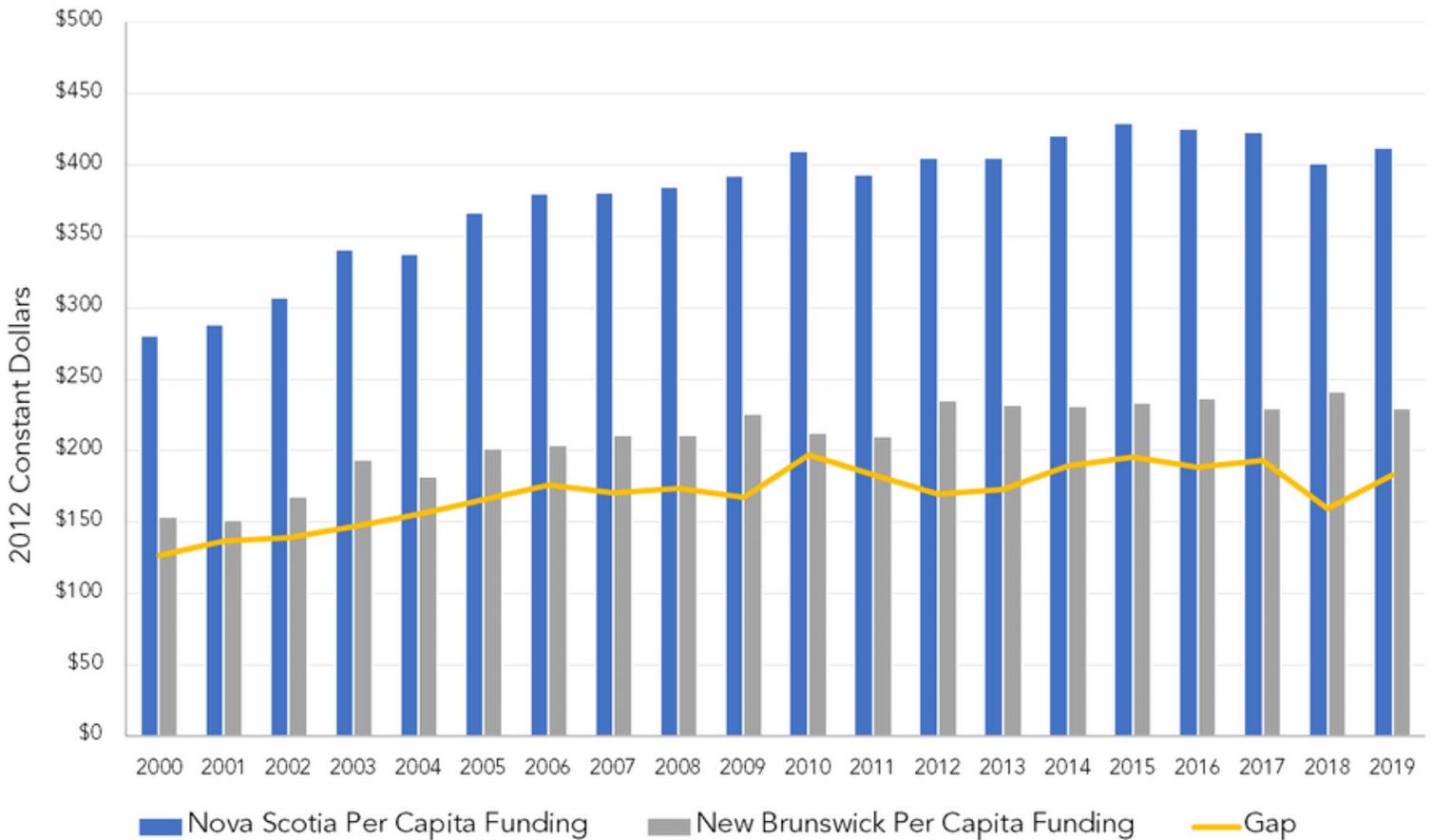
Figure 2: R&D Funding for Universities in New Brunswick (2012 Constant Dollars)



(See full data in Appendix A)

Figure 3 shows the gap in per capita funding levels between New Brunswick and Nova Scotia. Since 2000, the gap has grown to \$183 a person, representing a 44% increase. More recently, the gap is down from \$196 in 2015 to \$183 in 2019.

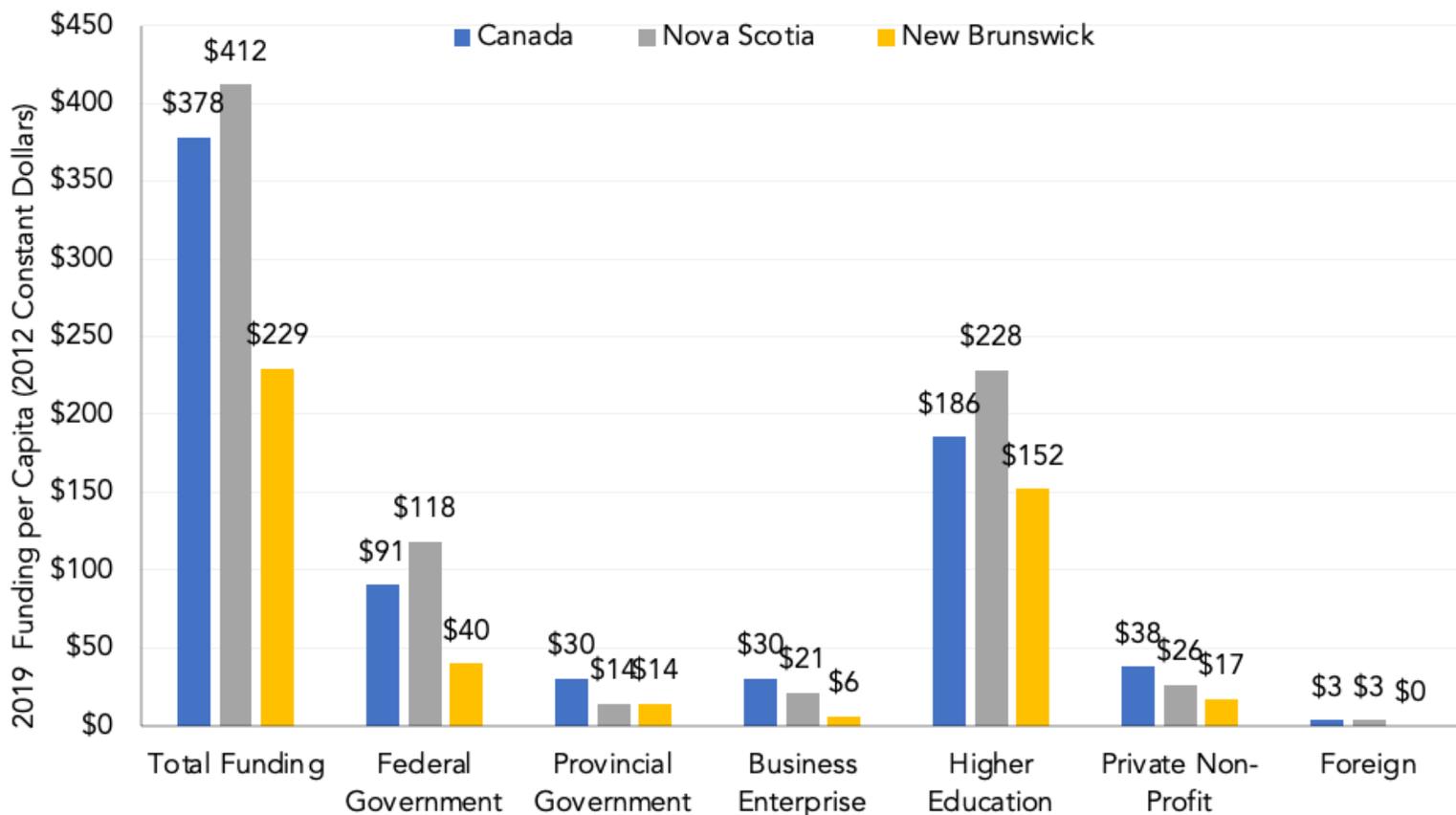
Figure 3: Per Capita Funding for Post-Secondary Education R&D in New Brunswick and Nova Scotia (2012 Constant Dollars)



(See full data in Appendix A)

At \$229 per person (in 2019), New Brunswick’s higher education sector has a lower per capita R&D value than the national average (\$378 per person) and Nova Scotia (\$412 per person). This gap in investment is consistent across all funding sources, as shown in Figure 4.

Figure 4: 2019 Per Capita Funding for Higher Education Sector R&D in New Brunswick, Nova Scotia, and Canada, by Source (2012 Constant Dollars)



(See full data in Appendix A)

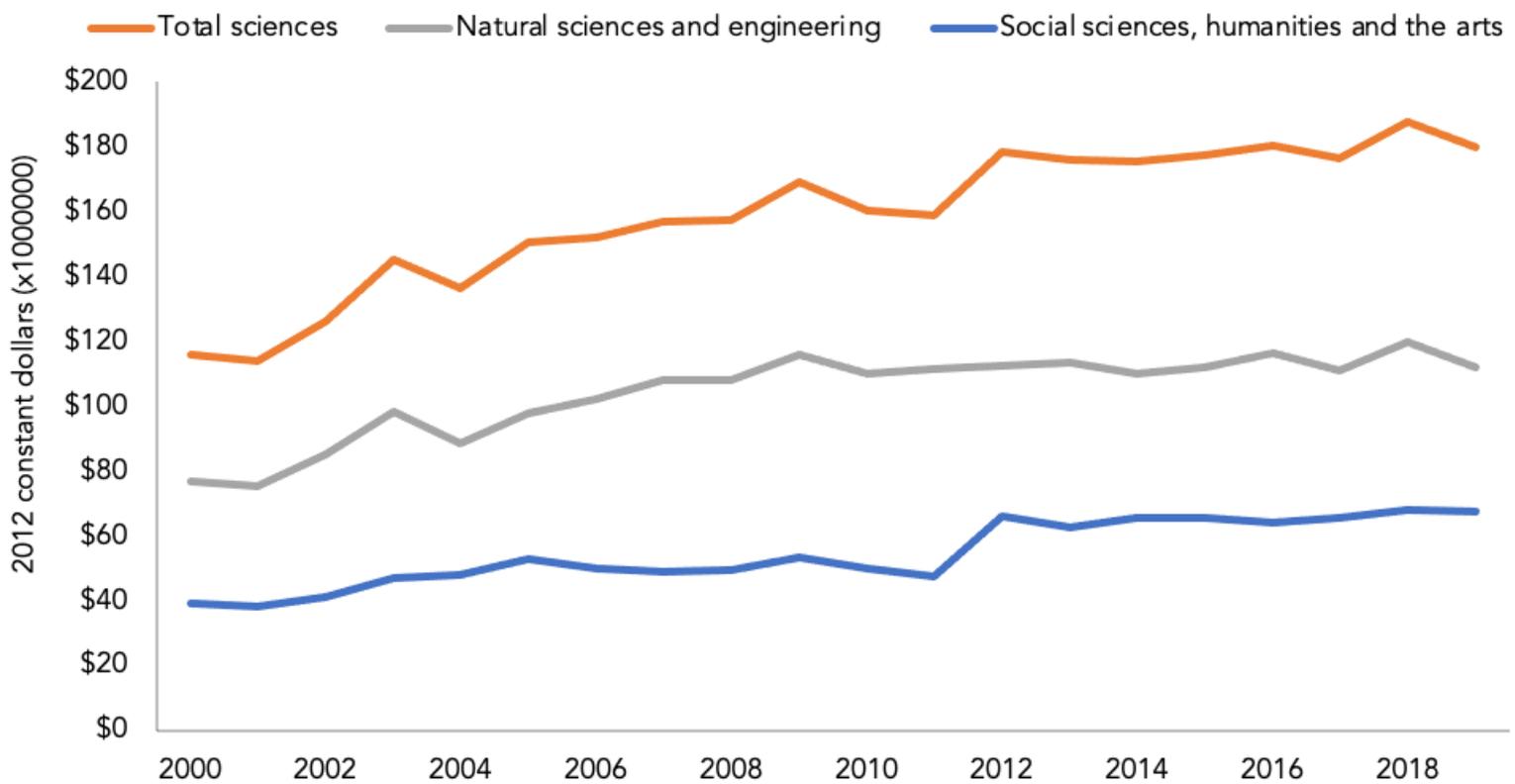
A CLOSER LOOK

R&D Funding For Various Subjects

Funding for R&D in New Brunswick is divided into two groups: 1) R&D in Natural Sciences and Engineering and 2) R&D in Social Sciences and Humanities. Of the \$179.7 million of R&D implemented in New Brunswick during 2019/2020, \$111.9 million (62.3%) went to Natural Sciences and Engineering and \$67.7 million (37.7%) went to Social Sciences and Humanities.

Figure 5 shows that funding in both categories has steadily been growing since 2005, with Social Sciences and Humanities seeing a large increase between 2011 and 2012 and then stabilizing at around \$65 million from 2014 to 2018. However, in 2019 we can notice that there was a decline in the funding for natural sciences and engineering, which caused a decline in the funding of total sciences.

Figure 5: Funding for Higher Education Sector R&D, by Subject (2012 Constant Dollars)

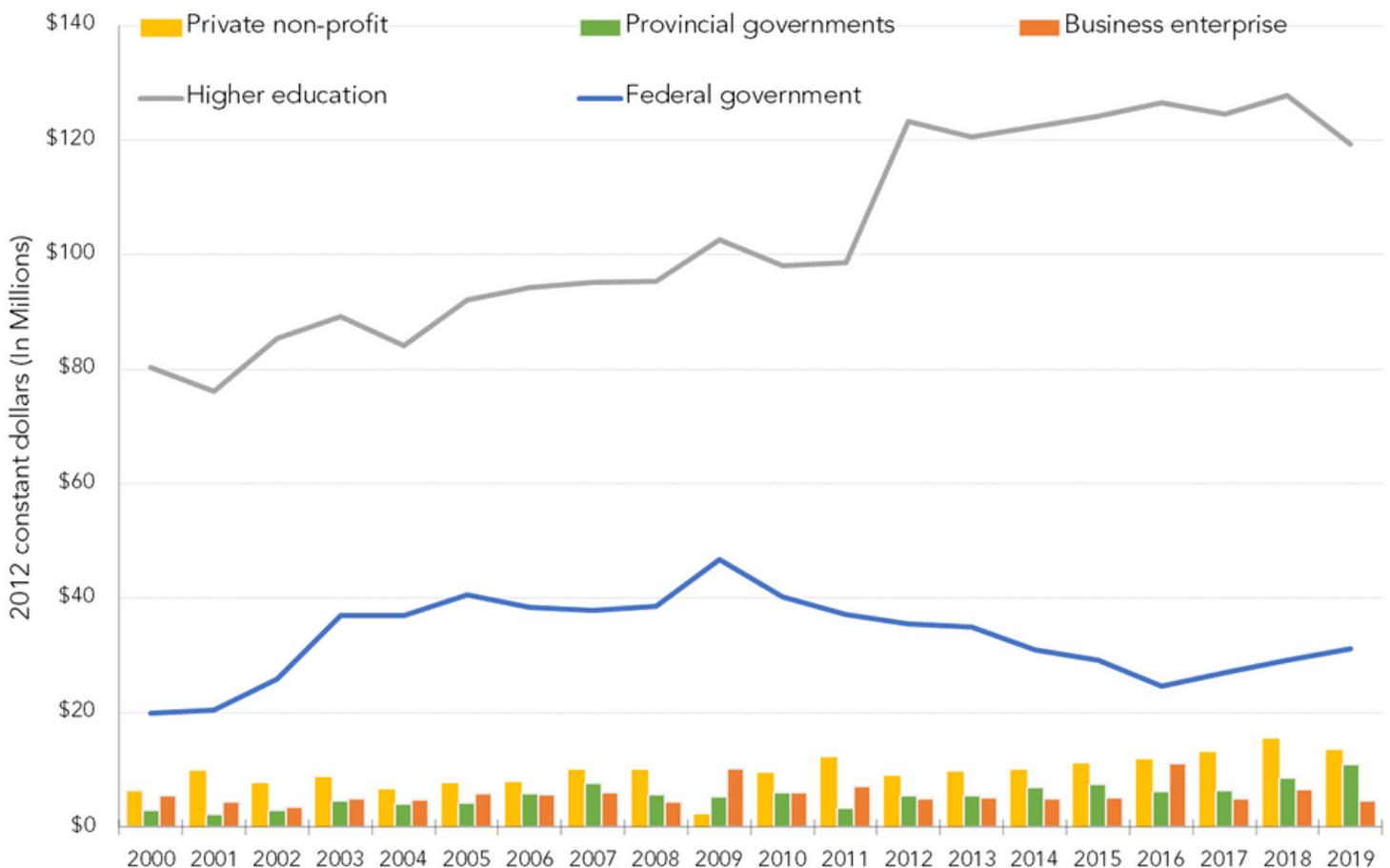


(See full data in Appendix B)

R&D Funding Sources

Funding for R&D comes from six major sources: federal government, provincial government, business enterprise, private non-profits, and the higher education sector (see Figure 6). Over half of the funding for R&D activity in New Brunswick comes from the higher education sector, which provided \$119.2 million (66%) in 2019/2020. This sector is not only the most important source of funding for R&D, but it is also the fastest-growing, as other sources have flattened in recent years. The federal government is the second-largest source of funding, giving \$31.2 million (17.4%) in 2019/2020.

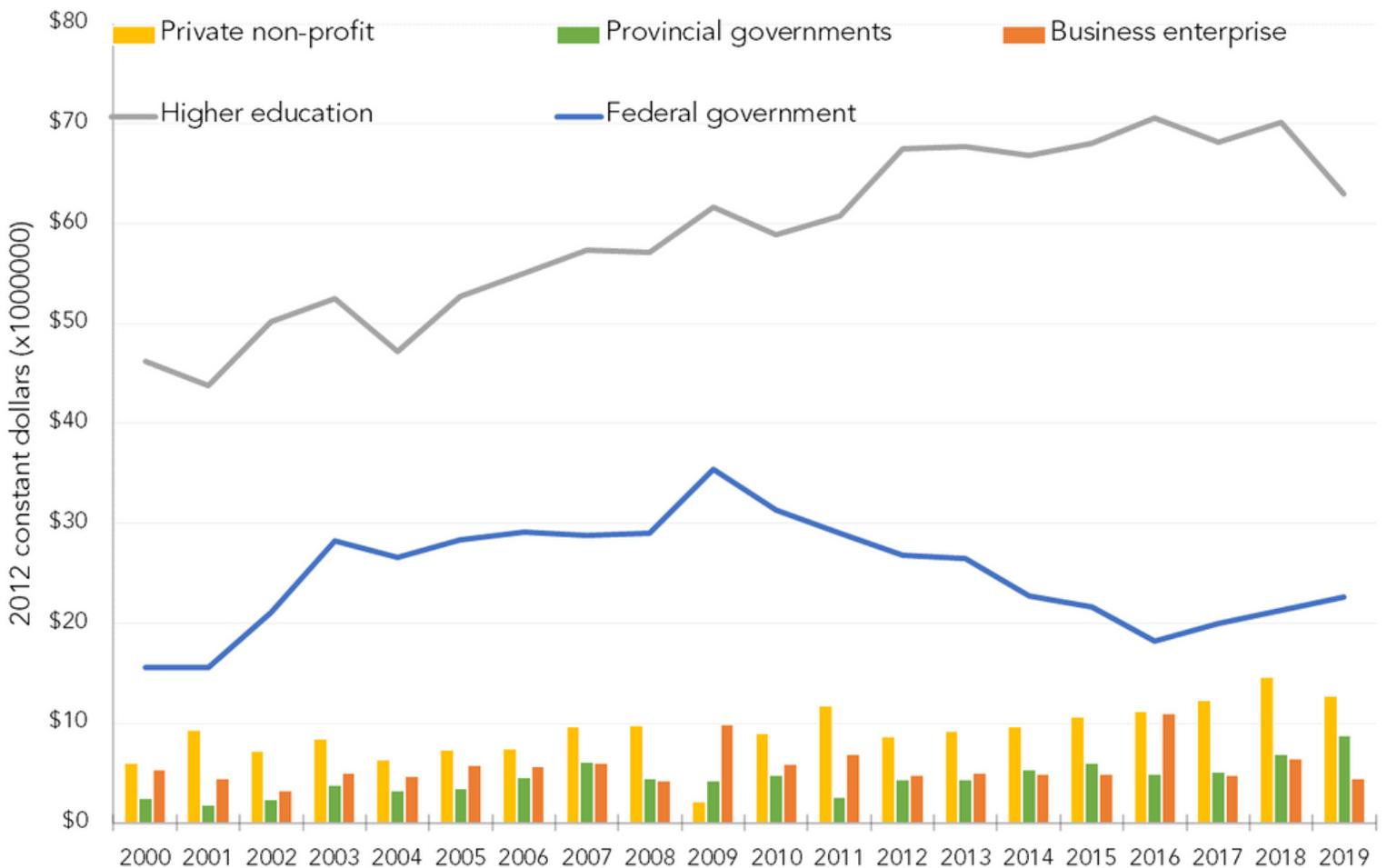
Figure 6: Funding for R&D Implemented by Higher Education Sector, by Source (2012 Constant Dollars)



(See full data in Appendix C)

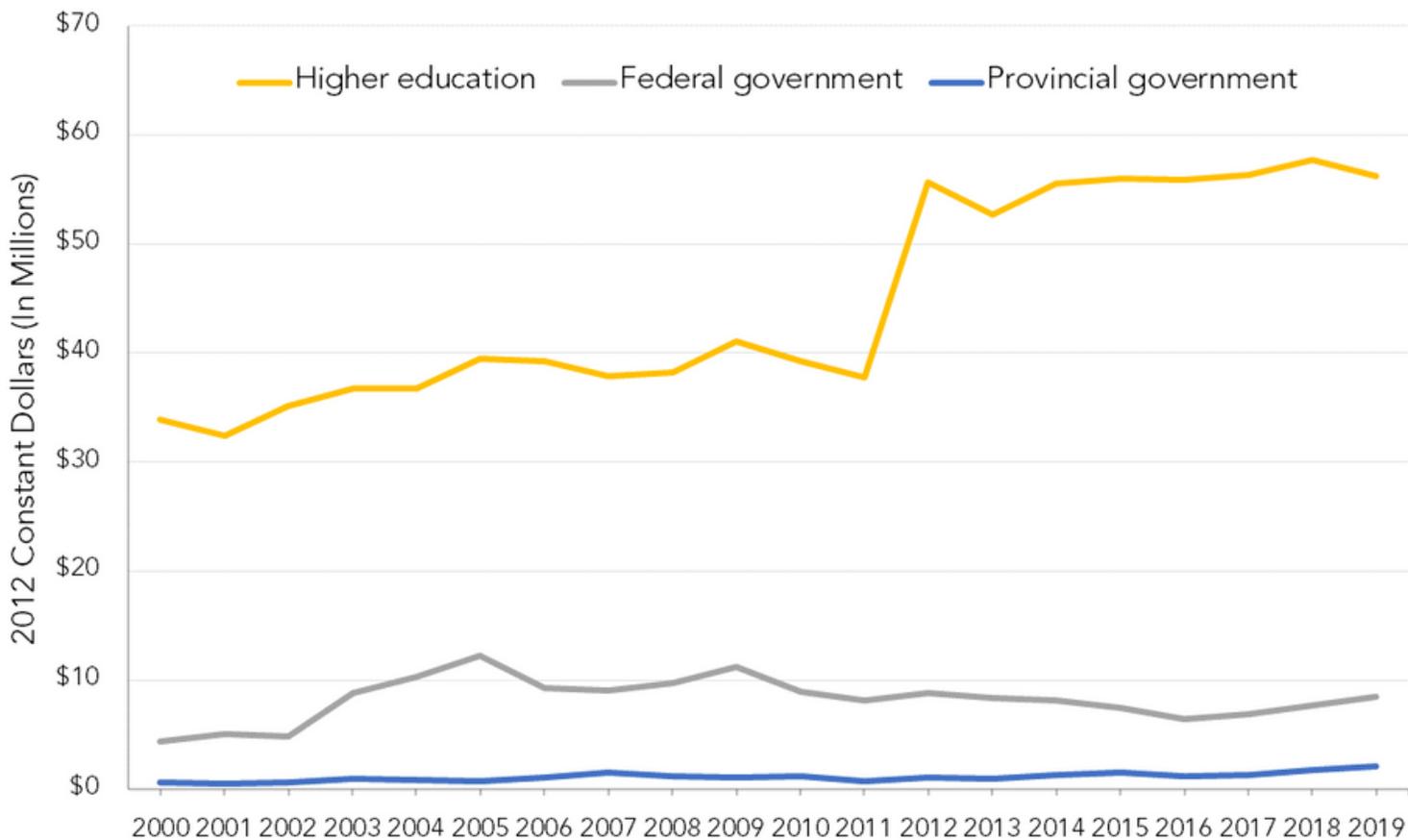
A comparison of Figures 7 and 8 shows that both Natural Sciences and Engineering and Social Sciences and Humanities saw a significant increase in R&D funding from the higher education sector from 2011 to 2012. Figure 7 registers this increase more dramatically since Social Sciences and Humanities have fewer funding sources than Natural Sciences and Engineering.

Figure 7: Funding for Natural Sciences and Engineering R&D Implemented by Higher Education Sector, by Source (2012 Constant Dollars)



(See full data in Appendix C)

Figure 8: Funding for Social Sciences and Humanities R&D Implemented by Higher Education Sector, by Source (2012 Constant Dollars)



(See full data in Appendix C)

SUMMARY

- R&D funding for New Brunswick post-secondary institutions has seen an overall decline in the past several years.
- Compared to Nova Scotia, New Brunswick has a very low R&D funding as the gap between the per capita funding has either been increasing or steady.
- In the last year, the goal seems to be progressing due to the increase in the trend of R&D funding, however, the annual increments are marginal compared to the annual increments of Canada and other provinces like Nova Scotia and hence New Brunswick is not progressing for this goal.
- Having high post-secondary education in R&D is key to attracting more researchers and students. It can also lead to an increase in private sector entities interested in partnering with post-secondary institutions.

APPENDIX A

R&D Funding for Universities in New Brunswick

| Year | Total (x1000) | NB CPI | Total (2012 Constant Dollars x1000) | NB Baseline (2009) (thousands) | Goal (x1000) | NS Baseline (thousands) |
|------|----------------|--------|-------------------------------------|--------------------------------|--------------|-------------------------|
| 1999 | \$ 31,770 | 92.1 | \$41,980.55 | \$72,158.31 | \$144,317 | \$182,000 |
| 2000 | \$ 28,638 | 95.4 | \$36,532.96 | \$72,158.31 | \$144,317 | \$182,000 |
| 2001 | \$ 33,081 | 97.8 | \$41,165.21 | \$72,158.31 | \$144,317 | \$182,000 |
| 2002 | \$ 33,647 | 100 | \$40,948.40 | \$72,158.31 | \$144,317 | \$182,000 |
| 2003 | \$ 45,617 | 102.8 | \$54,003.78 | \$72,158.31 | \$144,317 | \$182,000 |
| 2004 | \$ 50,126 | 104.7 | \$58,264.89 | \$72,158.31 | \$144,317 | \$182,000 |
| 2005 | \$ 56,132 | 107 | \$63,843.59 | \$72,158.31 | \$144,317 | \$182,000 |
| 2006 | \$ 59,664 | 109.1 | \$66,554.62 | \$72,158.31 | \$144,317 | \$182,000 |
| 2007 | \$ 59,423 | 111.5 | \$64,859.01 | \$72,158.31 | \$144,317 | \$182,000 |
| 2008 | \$ 65,259 | 114.1 | \$69,605.79 | \$72,158.31 | \$144,317 | \$182,000 |
| 2009 | \$ 67,830 | 114.4 | \$72,158.31 | \$72,158.31 | \$144,317 | \$182,000 |
| 2010 | \$ 60,945 | 116.5 | \$63,665.29 | \$72,158.31 | \$144,317 | \$182,000 |
| 2011 | \$ 65,162 | 119.9 | \$66,140.25 | \$72,158.31 | \$144,317 | \$182,000 |
| 2012 | \$ 62,599 | 121.7 | \$62,599.00 | \$72,158.31 | \$144,317 | \$182,000 |
| 2013 | \$ 57,978 | 122.8 | \$57,458.65 | \$72,158.31 | \$144,317 | \$182,000 |
| 2014 | \$ 55,767 | 125.2 | \$54,208.02 | \$72,158.31 | \$144,317 | \$182,000 |
| 2015 | \$ 55,199 | 126.6 | \$53,062.55 | \$72,158.31 | \$144,317 | \$182,000 |
| 2016 | \$ 65,240 | 128.4 | \$61,835.73 | \$72,158.31 | \$144,317 | \$182,000 |
| 2017 | \$ 55,249 | 130.4 | \$51,562.91 | \$72,158.31 | \$144,317 | \$182,000 |
| 2018 | \$ 66,910 | 133.4 | \$61,041.58 | \$72,158.31 | \$144,317 | \$182,000 |
| 2019 | \$ 69,117 | 136 | \$61,849.55 | \$72,158.31 | \$144,317 | \$182,000 |

Source: Financial Information of Universities and Colleges (FIUC) 1980-2017; Statistics Canada, CANSIM table 326-0021: Consumer Price Index, annual average, not seasonally adjusted

APPENDIX A

Per Capita Funding for Post-Secondary Education R&D in New Brunswick and Nova Scotia (2012 Constant Dollars)

| Year | NB Per Capita R&D Funding | NS Per Capita R&D Funding | Gap Between NS and NB (NS-NB) |
|------|---------------------------|---------------------------|-------------------------------|
| 2000 | \$154 | \$281 | \$127 |
| 2001 | \$152 | \$289 | \$137 |
| 2002 | \$168 | \$307 | \$139 |
| 2003 | \$193 | \$341 | \$147 |
| 2004 | \$182 | \$338 | \$156 |
| 2005 | \$201 | \$367 | \$166 |
| 2006 | \$204 | \$380 | \$176 |
| 2007 | \$211 | \$381 | \$171 |
| 2008 | \$211 | \$384 | \$174 |
| 2009 | \$226 | \$393 | \$167 |
| 2010 | \$213 | \$410 | \$197 |
| 2011 | \$210 | \$393 | \$183 |
| 2012 | \$235 | \$405 | \$170 |
| 2013 | \$232 | \$405 | \$173 |
| 2014 | \$231 | \$421 | \$190 |
| 2015 | \$234 | \$429 | \$196 |
| 2016 | \$236 | \$425 | \$189 |
| 2017 | \$230 | \$423 | \$193 |
| 2018 | \$242 | \$401 | \$160 |
| 2019 | \$229 | \$412 | \$183 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000); Statistics Canada, CANSIM Table 051-0001: Estimates of population, by age group and sex for July 1, Canada, provinces, and territories, annual (persons)

APPENDIX A

2019 Per Capita Funding for Higher Education Sector R&D in
New Brunswick, Nova Scotia, and Canada, by Source
(In 2012 Constant Dollars)

| Sector | Canada | Nova Scotia | New Brunswick |
|-----------------------|--------|-------------|---------------|
| Total Funding | \$378 | \$412 | \$229 |
| Federal Government | \$91 | \$118 | \$40 |
| Provincial Government | \$30 | \$14 | \$14 |
| Business Enterprise | \$30 | \$21 | \$6 |
| Higher Education | \$186 | \$228 | \$152 |
| Private Non-Profit | \$38 | \$26 | \$17 |
| Foreign | \$3 | \$3 | \$0 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000); Statistics Canada, CANSIM Table 051-0001: Estimates of population, by age group and sex for July 1, Canada, provinces, and territories, annual (persons)

APPENDIX B

Funding for Higher Education Sector R&D, by Subject (2012
Constant Dollars in Millions)

| Year | Total sciences | Natural sciences and engineering | Social sciences, humanities, and the arts |
|------|----------------|----------------------------------|---|
| 2000 | \$115.70 | \$76.62 | \$39.07 |
| 2001 | \$113.84 | \$75.42 | \$38.31 |
| 2002 | \$126.07 | \$85.03 | \$41.04 |
| 2003 | \$144.95 | \$98.01 | \$46.82 |
| 2004 | \$136.54 | \$88.41 | \$48.03 |
| 2005 | \$150.62 | \$97.69 | \$53.05 |
| 2006 | \$152.04 | \$102.05 | \$49.99 |
| 2007 | \$156.95 | \$108.06 | \$48.90 |
| 2008 | \$157.39 | \$107.84 | \$49.44 |
| 2009 | \$169.29 | \$115.81 | \$53.48 |
| 2010 | \$160.10 | \$110.10 | \$49.90 |
| 2011 | \$158.90 | \$111.40 | \$47.50 |
| 2012 | \$178.30 | \$112.20 | \$66.20 |
| 2013 | \$176.00 | \$113.20 | \$62.70 |
| 2014 | \$175.50 | \$109.80 | \$65.60 |
| 2015 | \$177.50 | \$111.80 | \$65.60 |
| 2016 | \$180.50 | \$116.20 | \$64.20 |
| 2017 | \$176.20 | \$110.80 | \$65.40 |
| 2018 | \$187.70 | \$119.70 | \$67.90 |
| 2019 | \$179.70 | \$111.90 | \$67.70 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000)

APPENDIX C

Funding for R&D Performed by Higher Education Sector, by Source (2012 Constant Dollars in Millions)

| Year | Federal government | Provincial governments | Business enterprise | Higher education | Private non-profit | Foreign sector |
|------|--------------------|------------------------|---------------------|------------------|--------------------|----------------|
| 2000 | \$19.97 | \$3.06 | \$5.46 | \$80.33 | \$6.33 | \$0.76 |
| 2001 | \$20.52 | \$2.29 | \$4.48 | \$76.08 | \$9.82 | \$0.55 |
| 2002 | \$25.87 | \$2.95 | \$3.49 | \$85.46 | \$7.64 | \$0.76 |
| 2003 | \$37.00 | \$4.69 | \$5.02 | \$89.17 | \$8.84 | \$0.11 |
| 2004 | \$36.89 | \$4.04 | \$4.80 | \$84.04 | \$6.55 | \$0.22 |
| 2005 | \$40.60 | \$4.26 | \$5.78 | \$92.12 | \$7.75 | \$0.11 |
| 2006 | \$38.42 | \$5.78 | \$5.68 | \$94.30 | \$7.86 | \$0.00 |
| 2007 | \$37.87 | \$7.64 | \$6.11 | \$95.18 | \$10.04 | \$0.11 |
| 2008 | \$38.64 | \$5.68 | \$4.37 | \$95.40 | \$10.04 | \$3.17 |
| 2009 | \$46.72 | \$5.35 | \$10.15 | \$102.60 | \$2.18 | \$2.18 |
| 2010 | \$40.30 | \$6.00 | \$6.00 | \$98.10 | \$9.50 | \$0.00 |
| 2011 | \$37.10 | \$3.30 | \$7.20 | \$98.60 | \$12.30 | \$0.20 |
| 2012 | \$35.50 | \$5.50 | \$5.00 | \$123.20 | \$9.00 | \$0.10 |
| 2013 | \$35.00 | \$5.50 | \$5.20 | \$120.50 | \$9.60 | \$0.00 |
| 2014 | \$31.00 | \$6.90 | \$5.00 | \$122.30 | \$10.10 | \$0.00 |
| 2015 | \$29.20 | \$7.50 | \$5.10 | \$124.20 | \$11.20 | \$0.00 |
| 2016 | \$24.70 | \$6.20 | \$11.10 | \$126.50 | \$11.80 | \$0.00 |
| 2017 | \$27.00 | \$6.50 | \$4.90 | \$124.50 | \$13.10 | \$0.00 |
| 2018 | \$29.10 | \$8.60 | \$6.60 | \$127.80 | \$15.40 | \$0.00 |
| 2019 | \$31.20 | \$11.00 | \$4.60 | \$119.20 | \$13.50 | \$0.00 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000)

APPENDIX C

Funding for Natural Sciences and Engineering R&D Performed by Higher Education Sector, by Source (2012 Constant Dollars in Millions)

| Year | Federal government | Provincial governments | Business enterprise | Higher education | Private non-profit | Foreign sector |
|------|--------------------|------------------------|---------------------|------------------|--------------------|----------------|
| 2000 | \$15.61 | \$2.51 | \$5.35 | \$46.28 | \$6.00 | \$0.76 |
| 2001 | \$15.61 | \$1.86 | \$4.48 | \$43.77 | \$9.39 | \$0.55 |
| 2002 | \$21.07 | \$2.40 | \$3.27 | \$50.21 | \$7.31 | \$0.76 |
| 2003 | \$28.27 | \$3.82 | \$5.02 | \$52.50 | \$8.51 | \$0.11 |
| 2004 | \$26.63 | \$3.27 | \$4.69 | \$47.26 | \$6.33 | \$0.22 |
| 2005 | \$28.38 | \$3.49 | \$5.78 | \$52.72 | \$7.42 | \$0.11 |
| 2006 | \$29.14 | \$4.58 | \$5.68 | \$55.01 | \$7.53 | \$0.00 |
| 2007 | \$28.82 | \$6.11 | \$6.00 | \$57.30 | \$9.71 | \$0.11 |
| 2008 | \$29.03 | \$4.48 | \$4.26 | \$57.08 | \$9.82 | \$3.17 |
| 2009 | \$35.47 | \$4.26 | \$9.93 | \$61.67 | \$2.18 | \$2.18 |
| 2010 | \$31.30 | \$4.80 | \$5.90 | \$58.90 | \$9.00 | \$0.00 |
| 2011 | \$29.00 | \$2.60 | \$6.90 | \$60.80 | \$11.80 | \$0.20 |
| 2012 | \$26.80 | \$4.40 | \$4.80 | \$67.50 | \$8.70 | \$0.10 |
| 2013 | \$26.50 | \$4.40 | \$5.10 | \$67.70 | \$9.20 | \$0.00 |
| 2014 | \$22.80 | \$5.40 | \$4.90 | \$66.80 | \$9.70 | \$0.00 |
| 2015 | \$21.70 | \$6.00 | \$5.00 | \$68.10 | \$10.70 | \$0.00 |
| 2016 | \$18.20 | \$5.00 | \$11.00 | \$70.60 | \$11.20 | \$0.00 |
| 2017 | \$20.00 | \$5.20 | \$4.80 | \$68.20 | \$12.30 | \$0.00 |
| 2018 | \$21.30 | \$6.90 | \$6.50 | \$70.10 | \$14.70 | \$0.00 |
| 2019 | \$22.60 | \$8.80 | \$4.50 | \$63.00 | \$12.80 | \$0.00 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000)

APPENDIX C

Funding for Social Sciences and Humanities R&D Performed by Higher Education Sector, by Source (2012 Constant Dollars in Millions)

| Year | Federal government | Provincial government | Business enterprise | Higher education | Private non-profit | Foreign |
|------|--------------------|-----------------------|---------------------|------------------|--------------------|---------|
| 2000 | \$4.37 | \$0.65 | \$0.00 | \$33.84 | \$0.22 | \$0.00 |
| 2001 | \$5.02 | \$0.55 | \$0.00 | \$32.42 | \$0.55 | \$0.00 |
| 2002 | \$4.80 | \$0.65 | \$0.11 | \$35.15 | \$0.44 | \$0.00 |
| 2003 | \$8.84 | \$0.98 | \$0.00 | \$36.67 | \$0.33 | \$0.00 |
| 2004 | \$10.26 | \$0.87 | \$0.11 | \$36.67 | \$0.22 | \$0.00 |
| 2005 | \$12.22 | \$0.76 | \$0.00 | \$39.51 | \$0.33 | \$0.00 |
| 2006 | \$9.28 | \$1.09 | \$0.11 | \$39.18 | \$0.33 | \$0.00 |
| 2007 | \$9.06 | \$1.53 | \$0.11 | \$37.87 | \$0.33 | \$0.00 |
| 2008 | \$9.71 | \$1.20 | \$0.00 | \$38.20 | \$0.44 | \$0.00 |
| 2009 | \$11.24 | \$1.09 | \$0.22 | \$41.04 | \$0.00 | \$0.00 |
| 2010 | \$8.90 | \$1.20 | \$0.10 | \$39.20 | \$0.30 | \$0.00 |
| 2011 | \$8.10 | \$0.70 | \$0.30 | \$37.80 | \$0.50 | \$0.00 |
| 2012 | \$8.80 | \$1.10 | \$0.30 | \$55.70 | \$0.30 | \$0.00 |
| 2013 | \$8.40 | \$1.00 | \$0.00 | \$52.70 | \$0.30 | \$0.00 |
| 2014 | \$8.10 | \$1.30 | \$0.00 | \$55.50 | \$0.40 | \$0.00 |
| 2015 | \$7.50 | \$1.50 | \$0.00 | \$56.00 | \$0.40 | \$0.00 |
| 2016 | \$6.40 | \$1.20 | \$0.00 | \$55.90 | \$0.50 | \$0.00 |
| 2017 | \$6.90 | \$1.30 | \$0.00 | \$56.30 | \$0.70 | \$0.00 |
| 2018 | \$7.70 | \$1.70 | \$0.00 | \$57.70 | \$0.70 | \$0.00 |
| 2019 | \$8.50 | \$2.10 | \$0.00 | \$56.20 | \$0.70 | \$0.00 |

Source: Statistics Canada, CANSIM Table 358-0162: Provincial estimates of research and development expenditures in the higher education sector, by funding sector and type of science, annual (dollars x 1,000,000)