

B.C. Post-Secondary Supply Model 2019/20 to 2030/31 Methodology Highlights

PREPARED FOR MINISTRY OF
ADVANCED EDUCATION AND
SKILLS TRAINING
BY BC STATS – NOVEMBER 2021

AUTHORS

Ian Darling

CONTACT

lan.Darling@gov.bc.ca

ACKNOWLEDGEMENTS

Funding for this project was made possible through the Labour Market Information initiative under the Canada-British Workforce Development Agreement (WDA), which is administered for B.C. by the Ministry of Advanced Education and Skills Training.

PUBLISH DATE

2021-11

Copyright © 2021, BC Stats. All rights reserved.

This material is owned by BC Stats and protected by copyright law. It may not be reproduced or redistributed without the prior written permission of BC Stats. To request permission to reproduce all or part of this material, please complete the copyright permission request form at <https://www2.gov.bc.ca/gov/content/home/copyright>.

Table of Contents

1. Occupation Outcomes Highlights	1
1.1. Introduction.....	1
1.2. Highlights	1
1.3. Data Sources.....	2
2. How the PSSM Works.....	3
2.1. Graduation Projection Model	4
2.2. Occupation Projection Model.....	5
3. Data Sources.....	7
3.1. BC Student Outcomes Program	7
3.2. Student Transitions Project.....	8
3.3. 2016 Census.....	8

1. Occupation Outcomes Highlights

1.1. Introduction

The B.C. Post-Secondary Supply Model (PSSM) provides projections of the new supply of skilled labour for three age groups (17 to 29, 30 to 44, and 45 to 64) that will exit B.C.'s public post-secondary education system between 2019/20 and 2030/31 with a credential that takes three months or longer to complete. International students and not for credit or skills upgrading programs are not included. Likewise, the graduate projections do not include certain credentials at public research universities or Royal Roads University.

The model produces projections of the number of post-secondary graduates¹ by highest credential awarded and field of study, and then uses these projections as an input to project the new supply of available skilled labour² by occupation.

1.2. Highlights

During the period from 2019/20 to 2030/31, the PSSM makes the following projections for those aged 17 to 64:

- B.C.'s public post-secondary system will produce approximately 748,000 students with the necessary education to obtain a skilled occupation.
- Within two years of exiting the post-secondary system, an estimated 622,000 (or 83 percent) will enter the labour market by working or looking for work and not pursuing further studies.
- Approximately 561,000 (or 75 percent) will enter the labour market in British Columbia.
- Over 8 in 10 of the 561,000 former students are expected to find work in high-skilled occupations³ (457,000 or 81 percent) requiring post-secondary education.

¹ For some credentials, the PSSM also produces projections for near completers. Occupation projections of apprenticeship graduates include graduates from B.C.'s private post-secondary institutions.

² For the purpose of the PSSM, available skilled labour includes graduates working (full- or part-time), and graduates actively looking for work and not pursuing further studies.

³ High-skilled occupations (as defined by the National Occupational Classification (NOC) 2016) are those that normally require post-secondary education.

1.3. Data Sources

Administrative and survey data used in the PSSM come from a number of datasets, including:

1. BC Student Outcomes Program: Occupational outcomes
 - a) Baccalaureate Graduate Survey (BGS) two-year-out
 - b) BC Diploma, Associate Degree, and Certificate Student Outcomes (DAC) Survey
 - c) BC Apprenticeship Student Outcomes (APP) Survey
 - d) BC Trades Foundation and Trades-Related Vocational Student Outcomes Survey
2. Student Transitions Project (STP) (historical enrolment and graduation data)

In addition to administrative and survey data maintained by the K to 12 and post-secondary education system, the PSSM relies on the following data sources:

1. BC Stats, Population Estimates and Projections (by age and gender)
2. Statistics Canada, 2016 Census, custom table for B.C. (occupational outcomes for first professional degree, graduate certificate and diploma, master's and doctoral degree holders)

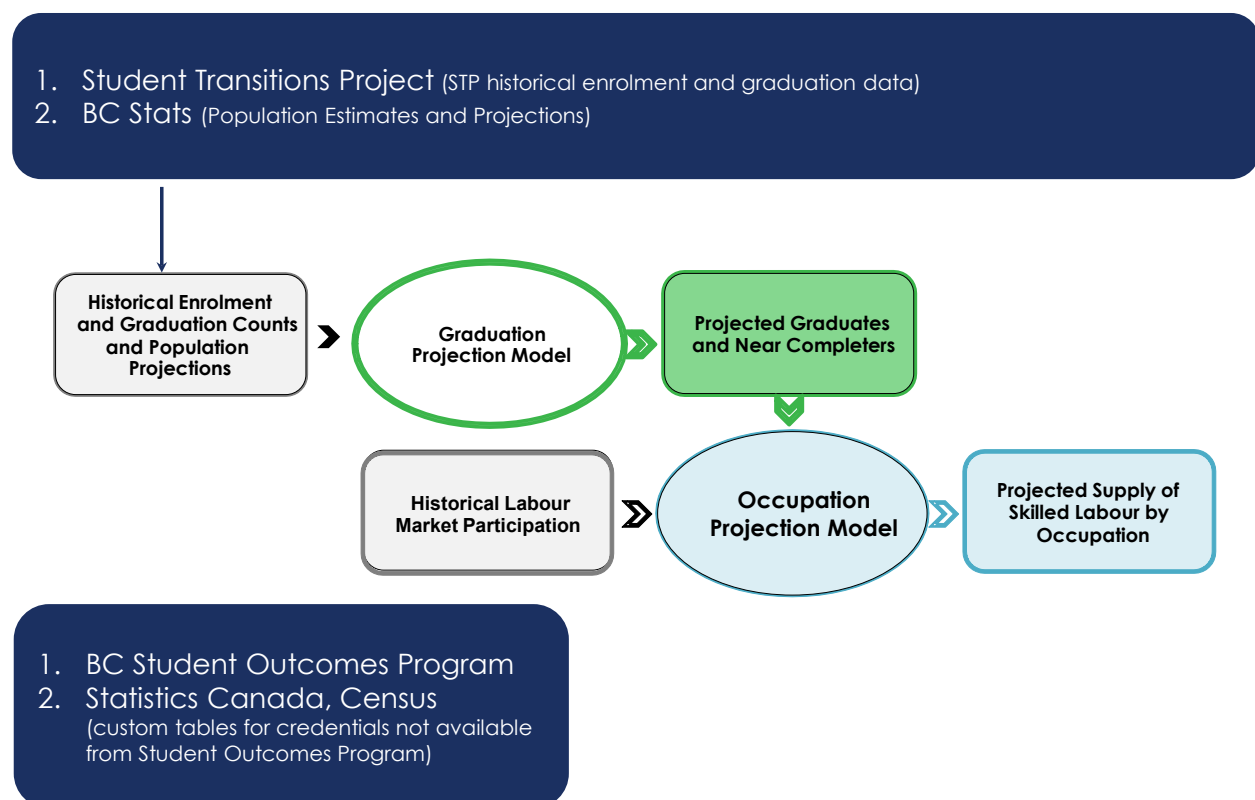
2. How the PSSM Works

The PSSM is composed of two main sub-models, as illustrated below in Figure 1.

The Graduation Projection Model estimates the number of graduates that will leave the post-secondary system during the forecast period. Not all of these graduates will make their services available to the labour market; some will continue onto further studies and others will postpone their entry into the labour force for other reasons (e.g., travel, family responsibilities, etc.).

The Occupation Projection Model combines graduation information with historical labour market participation patterns reported by former post-secondary students to predict how many of the forecasted graduates will, in fact, join the labour market, and in what type of job.

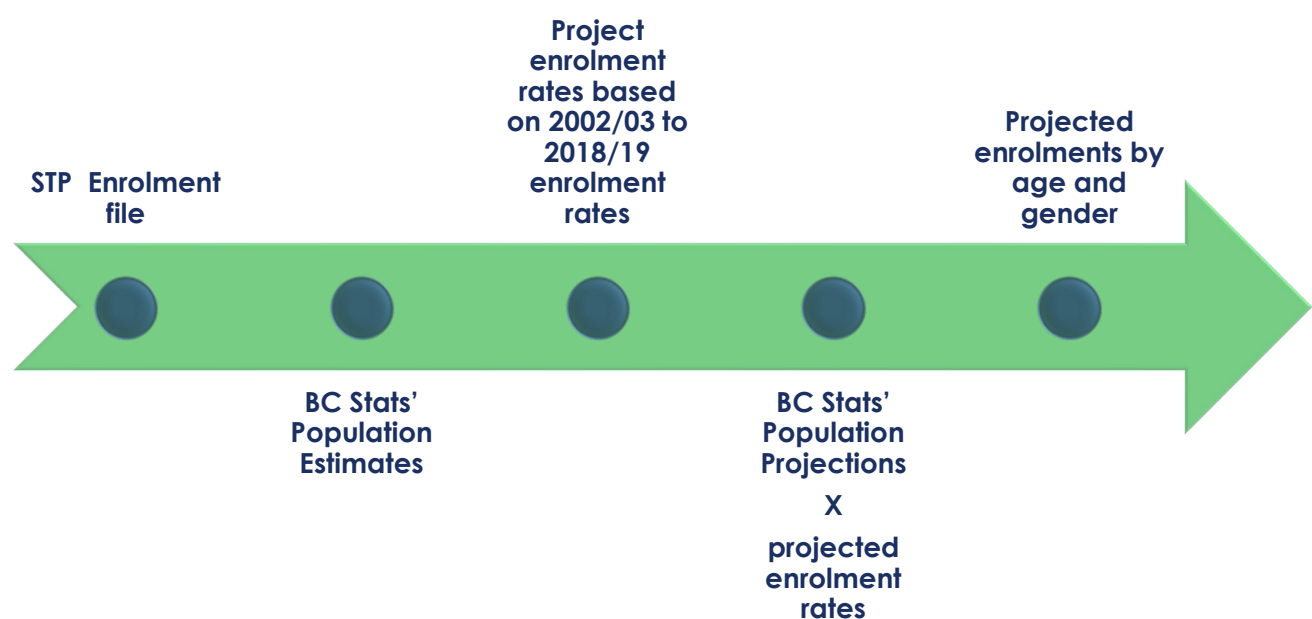
FIGURE 1: THE POST-SECONDARY SUPPLY MODEL



2.1. Graduation Projection Model

- 1) **Enrolment Projections:** The model begins by forecasting post-secondary enrolments. As shown below in Figure 2, enrolment projections are created by combining unique historical enrolment counts from the Student Transitions Project with population estimates by detailed age and gender groupings. The rate that each grouping is enrolled between 2002/03 and 2018/19 is then projected forward. The post-secondary enrolment rate is applied to population projections by detailed age and gender groupings produced by BC Stats⁴ to yield projected enrolments for each age and gender group.

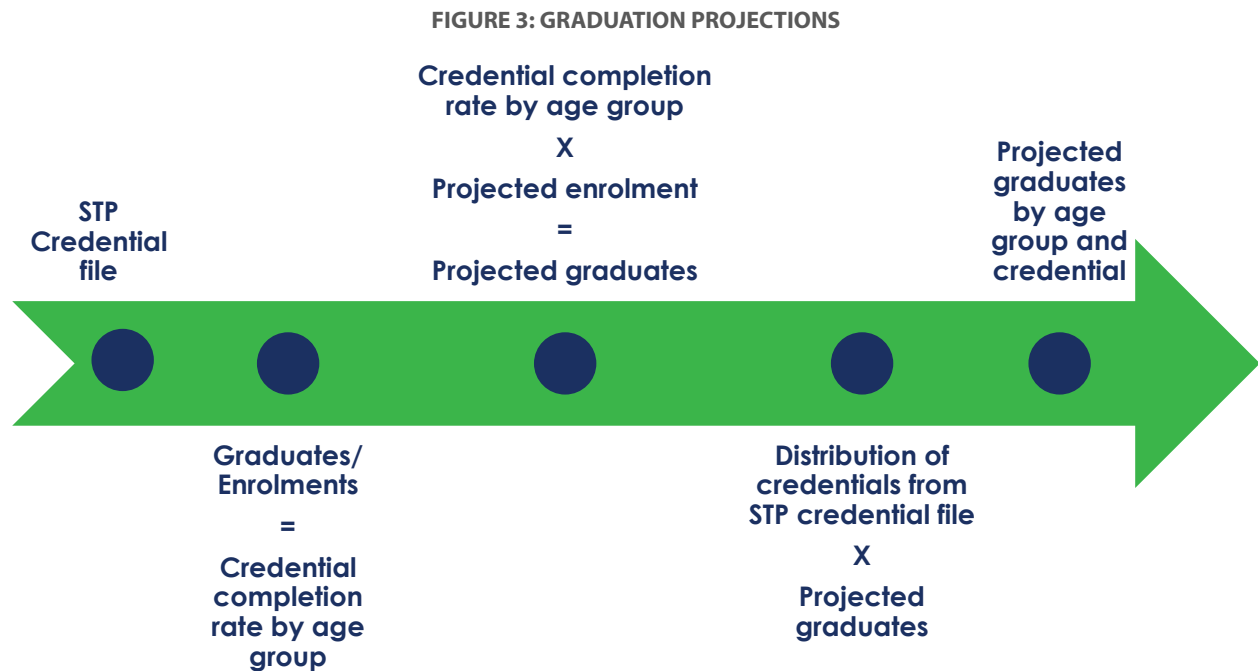
FIGURE 2: ENROLMENT PROJECTIONS



- 2) **Graduation Projections:** The next step is to forecast graduates by age group, credential and field of study. As depicted below in Figure 3, graduation projections are created first by finding, across all years, the highest credential completed for each former student so there is no double counting. A credential completion rate by age and gender groupings is calculated for the two most recent years by dividing graduates by enrolments. The credential completion rate is applied to the projected enrolments by age and gender. The two most recent years of highest credentials are used to determine the distribution of credentials (e.g. certificate, diploma, bachelor's degree, etc.) for the projected graduates. The Graduation Projection Model also

⁴ For further details regarding the assumptions of the population projection produced by BC Stats please visit <https://www2.gov.bc.ca/gov/content/data/statistics/people-population-community/population/population-projections>

forecasts separately the number of “near completers” in certificate, diploma, associate degree, university transfer, advanced certificate, advanced diploma, and post-degree certificate/diploma programs.



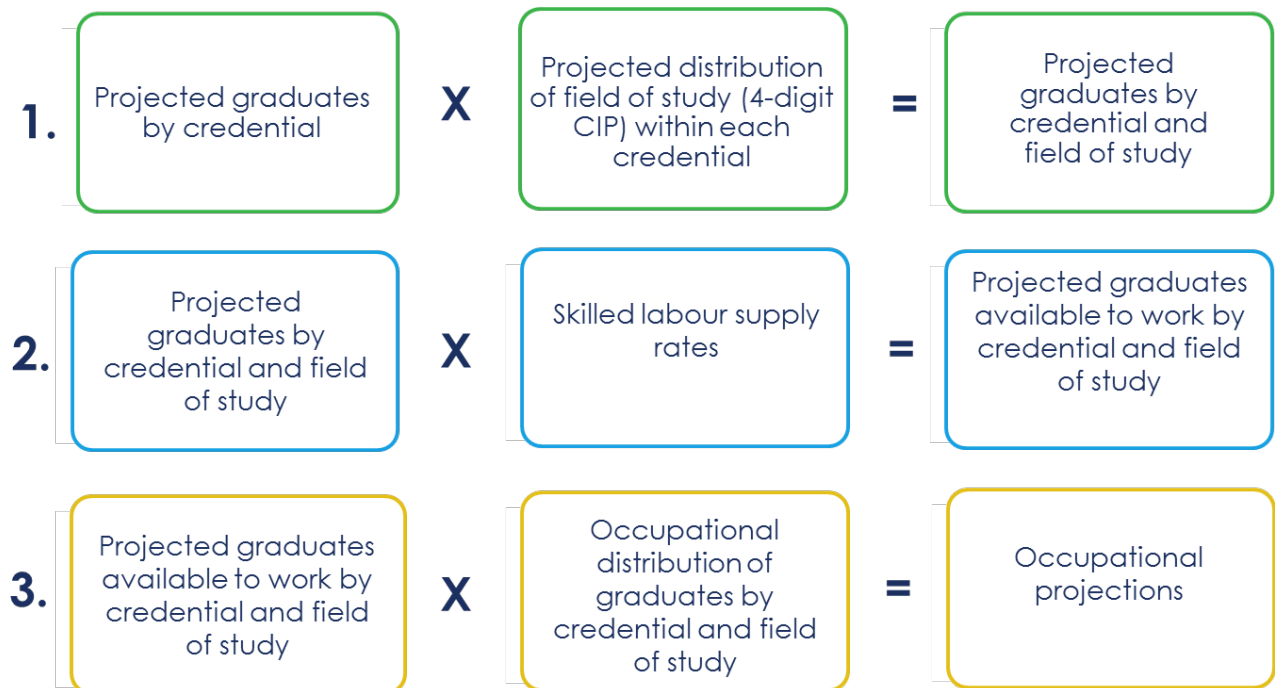
2.2. Occupation Projection Model

Projected graduates by credential and historical labour market information are used to generate estimates of skilled labour by occupation that will be available to the B.C. labour market. For each field of study and credential combination, the Occupation Projection Model uses data from the BC Student Outcomes Program (and 2016 Census for selected credentials) to predict how many of the expected graduates will make their skills available to the labour market, and in what occupation.

The main calculation steps for Occupation Project Model are summarized below in Figure 4. The steps include:

- 1) For each credential, the weighted five most recent years of graduates by age group from the STP credential file is assumed to reflect the future distribution of graduates across fields of study. The projected graduates by credential are multiplied by this field of study by credential distribution.
- 2) Projected graduates by credential and field of study are multiplied by the proportion of graduates available to work in B.C., in each credential and field of study combination.
- 3) Those graduates available to work are distributed to occupations. In the final step, the results from all credential and field of study combinations are summed.

FIGURE 4: OCCUPATION PROJECTION MODEL



3. Data Sources

3.1. BC Student Outcomes Program

Each year, thousands of students complete programs of study at British Columbia's public post-secondary institutions. These institutions and the Ministry of Advanced Education and Skills Training recognize that student feedback is important to maintaining a high-quality, relevant education system.

The detailed historical labour market information available for former students is critical to the reliability of the labour supply estimates produced by the PSSM. The model draws on results from four separate surveys, each focusing on a different segment of the post-secondary system:

- 1) The Baccalaureate Graduate Survey (BGS) two-year-out
- 2) BC Diploma, Associate Degree, and Certificate Student Outcomes (DAC) Survey
- 3) BC Apprenticeship Student Outcomes (APP) Survey
- 4) BC Trades Foundation and Trades-Related Vocational Student Outcomes Survey

The results from outcomes surveys provide the information needed to predict the proportion of graduates that will enter the labour market during the forecast period *and* the types of occupations they will most likely enter. The annual surveys are conducted on a census basis, yielding a high number of responses on which to base detailed labour market findings for specific fields of study and post-secondary credential combinations. Currently the PSSM draws results from the 2015 to 2019 survey years, using a progressive weighting system so that more recent years receive substantially more emphasis.

Occupation projections for public post-secondary institution graduates residing in B.C. are provided for apprenticeship, apprenticeship certificate, certificate, diploma, associate degree, university transfer, advanced certificate, advanced diploma, baccalaureate, first professional degree, post-degree certificate, post-degree diploma, graduate certificate, graduate diploma, master's degree, and doctoral degree programs. Students who substantially complete their credential are referred to as near completers. "Substantially complete" refers to students who complete at least 24 credits at their institution.

Occupation projections of apprenticeship graduates include graduates from B.C.'s private post-secondary institutions.

Some graduates cannot be included in the model because there is no Student Outcomes data for them and no suitable alternative: graduates of private post-secondary institutions (except apprenticeship), and certificate, diploma, advanced certificate, advanced diploma, post-degree certificate, post-degree diploma, graduate certificate, or graduate diplomas programs at public research universities or Royal Roads University.

3.2. Student Transitions Project

The Student Transitions Project analyses how students move from K to 12 into and through public post-secondary education. The STP is a partnership between the Ministry of Education, the Ministry of Advanced Education and Skills and Training, public post-secondary institutions, and the BC Council on Admissions and Transfer.

STP research is made possible through the use of Personal Education Numbers (PENs), which track student mobility. By linking PENs across the two education systems, the STP data can be used to analyse student transitions from high school into and among post-secondary institutions. This information helps government policy-makers, school districts, and post-secondary institutions plan programs to meet B.C.'s education and labour market requirements. For more information about the STP visit:

<https://www2.gov.bc.ca/gov/content/education-training/post-secondary-education/data-research/student-transitions-project>

3.3. 2016 Census

A custom tabulation purchased from Statistics Canada for the 2016 Census is used to determine the percentage of graduates with a first professional degree, graduate certificate or diploma, master's or doctoral degree expected to participate in the labour market and their occupation transition probabilities.



BC Stats is the provincial government's leader in statistical and economic research, information and analysis essential for evidence-based decision-making. BC Stats, the central statistics agency of government, is excited to be taking a lead role in the strategic understanding of data sources and analysis across government. The goal is to increase overall business intelligence—information decision makers can use. For more information, please contact Kathleen Assaf.



Box 9410 Stn Prov Govt
Victoria, B.C.
V8V 9V1

Web: www.bcstats.gov.bc.ca
Twitter: @BCStats
Email: BC.Stats@gov.bc.ca

