

URSULA MCCLOY, KATHLEEN WILLIAMS,  
STEPHEN CHILDS & KEVIN DU MANOIR

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# Transfer patterns of Seneca's business students: Student profile and academic success at Toronto universities

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**Seneca**

CENTRE FOR RESEARCH  
IN STUDENT MOBILITY

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## List of Contacts

### **URSULA MCCLOY**

Director, Centre for Research in Student Mobility

SENECA COLLEGE

*ursula.mccloy@senecacollege.ca*

### **KATHLEEN WILLIAMS**

Research Analyst, Centre for Research in Student Mobility

SENECA COLLEGE

*kate.williams@senecacollege.ca*

### **STEPHEN CHILDS**

Senior Institutional Analyst, Surveys and Special Projects

Office of Institutional Planning and Analysis

YORK UNIVERSITY

*sechilds@yorku.ca*

### **KEVIN DU MANOIR**

Senior Admission Data Analyst

Undergraduate Admissions and Recruitment

RYERSON UNIVERSITY

*kevin.dumanoir@ryerson.ca*

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## Executive Summary

Students in Toronto, Ontario, have several options close to the city when considering post-secondary institutions to attend, including, but not limited to, York University, Ryerson University, and Seneca College. The proximity of these and other post-secondary institutions in Toronto facilitates the movement of students between institutions and the creation of pathways.

Recently, ONCAT's business transfer committee, which is composed of college and university representatives from business faculties across Ontario, set a priority to "gather data and create a report to share widely on the success of transfer students in business." To address that priority, this study investigates the academic success of students who were enrolled in a Seneca College business program during 2012 through 2017, who either transferred to Seneca from York University or Ryerson University, or transferred from Seneca to York or Ryerson. Research questions include:

1. What share of Seneca's business students, including non-graduates and graduates, continue to a university program (including graduate degrees)? What share of Seneca business entrants transfer from a university program (including graduate certificates)?
2. What is the socio-demographic and academic profile of students who transfer in each direction? How does it compare with the profile of Seneca business students who have not transferred?
3. How well do transfer students perform academically after transfer? What are the socio-demographic, program and academic characteristics of those who are successful after transfer?
4. How well are students performing within transfer agreements and other high-volume pathways? Does the amount of transfer credit provided have an effect on student success?

### METHODS

The sample for the current study includes all Seneca students who enrolled in a business program at Seneca during 2012-13 to 2016-17 (n=24,610). The study sample was shared with York and Ryerson who, using a matching procedure based on students' personal identifiers, identified which of these students had enrolled at each respective institution at any time from 2007 to 2018. For each matched student, the universities then extracted detailed student data including: the program(s) enrolled in, credits attempted and earned per term, amount of transfer credit awarded upon university entry, term and cumulative GPA, graduation status, and program of graduation. Seneca merged the extracted university data with the College's previously created linked data file for all Seneca students. This linked dataset includes data on student demographics, Seneca grades and enrollment status, student survey responses at entry, math and English testing results, high school records, and neighbourhood income data from the 2006 census. This study presents the results of both descriptive and regression techniques.

## RESULTS

Of the 24,610 students enrolled in a Seneca business program between 2012 and 2017, approximately 11% attended either York or Ryerson between 2006-07 and 2017-18, and 0.2% attended all three institutions. In total, 1,233 transferred from York to Seneca, 392 from Ryerson to Seneca, 701 from Seneca to York, and 395 from Seneca to Ryerson.

### *Student profile*

- Overall, Seneca's business student population is older, with only 43% of students starting at age 20 or under. The share of Seneca students age 20 and under was much larger for those who transferred to York (71%) and Ryerson (58%). In contrast, the share of students age 20 or under entering Seneca from York or Ryerson was much lower, at 42% and 20% respectively.
- Business programs at Seneca attract large numbers of international students, with an overall share of 36% for the years studied. A high percentage of students who transferred from Seneca business to York were also international (42%) compared to the share who transferred to Ryerson (42% vs. 11%). The large majority of students transferring from York or Ryerson to Seneca were Canadian citizens (84% and 89%, respectively). Only 12% of transfers from York and 6% from Ryerson were international students.
- Two thirds of students who eventually transferred to Ryerson or York had plans for university upon college entry.
- University graduates entering Seneca primarily enrolled in graduate certificate programs (87%), whereas those who did not complete their university degree entered a range of credentials at Seneca, with 18% choosing a college degree. Of Seneca students continuing on to York or Ryerson, an overwhelming share entered business or related programs (82% at York, 95% at Ryerson), whereas university students entering Seneca came from various university programs.
- Only 32% of students entering Seneca graduated from university pre-transfer, whereas 78% of Seneca students who transferred to York or Ryerson had graduated pre-transfer.
- York and Ryerson students who came to Seneca without a degree had poor grades, with over two thirds obtaining an average of D or below prior to transfer. In contrast, the university degree-holders who transferred had much stronger grades, with 71% of Ryerson transfers and 47% of York transfers having a university average of B or above.
- Of Seneca students who transferred to university, 58% had a Seneca average of B or above, with graduates having higher averages than non-graduates.

*Propensity to transfer to university:* Older students, international students, and those who reported English as their first language, were less likely to transfer to York or Ryerson. Students in three-year diploma programs were most likely to transfer compared to students in the other credentials, whereas students from hospitality and tourism programs were less likely to transfer compared with students from most other program areas. Overall, academically stronger students were more likely to continue on to university: students who took university preparatory courses in high school, obtained good grades at Seneca, and performed well in math assessment testing at Seneca entry, were more likely to continue on to Ryerson or York. As would be expected, having plans for university at college entry, or receiving transfer advising at Seneca's Degree and Credit Transfer Office (DCTO), greatly increased the rate of transfer.

*Comparison of transfer and non-transfer Seneca students:* Students entering business programs from university have stronger high school grades and assessment scores than other non-transfer students, and are more likely to be retained and obtain good grades at Seneca. However, when these background characteristics, as well as socio-demographic characteristics, are controlled for in the regression models, university students perform similarly to other Seneca students.

*Success after transfer:* Few factors were found to significantly influence success for students who transfer to York or Ryerson: students who scored higher on math assessment upon Seneca entry and who had stronger Seneca GPAs (pre-transfer) obtained higher university GPAs and had higher odds of being retained within a year of transferring. The lack of effect of socio-demographic characteristics of interest (such as gender, age, status in Canada, first language) on post-transfer success is interesting; these characteristics may have directly influenced students' pre-transfer GPA and academic success, but had little or no direct effect on their post-transfer academic success.

At Seneca, students transferring from York or Ryerson obtained higher GPAs if they were female, came from a middle-income rather than a low-income neighbourhood, and had a parent with a degree. Academic background, including higher HS grades, English and math assessment testing, and university GPA were all associated with a higher GPA at Seneca. Similar factors were significant in the odds of graduating on-time, however, income and parent's education, and English assessment scores were not significant in the regression models.

*Pathway analysis:* For students entering Seneca from York or Ryerson, the selected pathways of interest were those entering a degree or graduate certificate program in business. Overall, 12% of Seneca's business degree students had transferred from York or Ryerson; over half them had pursued a business or related degree at university. These students had previously struggled in university, with 85% obtaining an average of D or below, and thus appear to be using the college degree pathway as a "second chance" at acquiring a degree. At Seneca they obtained lower grades than the non-transfer students (GPA of 2.3 vs. 2.5 for non-transfers) and had a higher withdrawal rate at three years after program entry (36% vs. 28%).

In contrast, students entering Seneca's graduate certificate programs in business had good grades at university and performed very well at Seneca in terms of graduation rates and grades; 84% graduated within one year, with a GPA of 3.6 /4. Students were primarily graduates from the social sciences and humanities (77%), with 58% entering one of two Seneca business programs: Human Resources Management and Public Relations – Corporate Communications.

Established pathways from Seneca business diplomas to commerce degrees were selected for in-depth analysis of Seneca business students who transferred to Ryerson or York. Overall, these long-standing pathways appear to be functioning well. The Seneca-to-Ryerson business pathway focuses on graduates of three-year business diploma programs who for the most part can enter the third year of one of several business management majors, or enter a stand-alone two-year degree completion program in business technology management. Despite taking, on average, a reduced course load, 43% obtained a Ryerson degree within two years, and 73% had a degree within three years of entering. At York, pathways to commerce degrees attract more Seneca graduates of two-year programs, and students on average take a reduced course load. Overall, 24% of Seneca graduates of two-year business programs completed a commerce degree at York within two years, and 40% within three years. In

comparison, 29% of the three-year diploma graduates completed their degree at York within two years, and 35% within three years. Regression models using the whole population of students who transferred to university, irrespective of pathway, showed that it was the amount of credit or advanced standing, as well as Seneca pre-transfer grades, that explained who graduated within two years. There was no institutional effect, indicating that the transfer policy was the key determinant.

## CONCLUSIONS

The significant bi-directional movement of students between Seneca College and major neighbouring universities, York and Ryerson, is noteworthy, reflective of longstanding institutional partnerships. Key drivers of success post-transfer (GPA and retention) include a student's GPA prior to transfer and math assessment scores, regardless of pathway (university to college or college to university).

Overall, the results suggest there are two populations of students taking the university-to-college pathway: (1) those who did poorly in university and did not graduate and are seeking a second chance at a post-secondary credential and 2) those who are successful university graduates and are choosing one-year graduate certificates with specialized training to prepare them for the labour market. Seneca business students transferring to university are, primarily, academically strong students who are continuing in business by laddering their Seneca diploma to a university degree.

## Introduction

Toronto has the largest number and highest concentration of post-secondary institutions in Canada, including four universities and four publicly funded colleges. Many Toronto students move between institutions and sectors within the city, in a large part due to the proximity and vast array of post-secondary options. Two institutions in particular, Ryerson University and York University, have had policies in place for the past 40 to 50 years to facilitate the transfer of students from college to university and have historically led the province in pathway options, receiving the highest share of college transfer students (McCloy, Steffler, & Decock, 2017a). Less is known about the flow of transfer students from Toronto universities to colleges.

Business programs have been a focus of both York's and Ryerson's development of college-to-university pathways. Recently, ONCAT's business transfer committee, which includes college and university representatives from business faculties across Ontario, set a priority to "gather data and create a report to share widely on the success of transfer students in business." In order to address that priority, this study aims to track the mobility patterns and success of Seneca College business students for the years 2012 through 2017. Several types of academic business program pathways between York, Ryerson and Seneca are investigated. Pathways of interest include:

1. Those likely geared to the labour market – such as combining two types of post-secondary education (PSE) credentials, particularly a degree and college graduate certificate,
2. Credential completion – such as starting a program at one institution, transferring credit, and completing at another institution, and
3. Admission pathways – such as not transferring credit but being eligible for admission at another institution.

Among students who do not complete their first credential prior to transfer are those who may have been academically unsuccessful, or did not find the right fit at their first institution, and therefore chose to switch programs and/or institutions. The student records at the sending institution may have shown these students as having withdrawn, and similarly, the records at the receiving institution may not have shown them to be transfers, especially if the students were not eligible for transfer credit. Transfer students who are not eligible for transfer credit may include those who graduated from college "access" or preparatory programs, or from other one-year college certificate programs, and subsequently enrolled in university with little or no credit. Therefore, the goal of this study is to follow students, using institutional administrative databases, who either start a program at university and move to a Seneca business program, or start a Seneca business program and continue on to university.

Research questions include:

1. What share of Seneca's business students, including leavers and graduates, continue on to a university program (including graduate degrees)? What share of Seneca business entrants transfer from a university program (including graduate certificates)?
2. What is the socio-demographic and academic profile of those who transfer in each direction? How does it compare with the profile of Seneca business students who have not transferred?

3. How well do transfer students perform academically after transfer? What are the socio-demographic, program, and academic characteristics of those who are successful after transfer?
4. How well are students performing within transfer agreements and other high-volume pathways? Does the amount of transfer credit provided have an effect on student success?

## Literature Review

### COLLEGE TO UNIVERSITY

#### TRANSFER STUDENT PROFILE

There has been extensive research looking to understand the profile of students who transfer from college to university, both in Ontario and specifically from Seneca College. At the provincial level, an analysis of the Key Performance Indicators (KPI) Graduate Survey shows that college graduates reporting a disability are only slightly less likely to transfer to university than those without a disability, and college graduates who are Indigenous do not differ in their transfer rates from non-Indigenous graduates (Williams & McCloy, 2019). In addition, college graduates who are less likely to transfer to university are older, from a rural community, do not live nearby a university, are from a low-income neighbourhood, are international, or attended college part-time. College graduates of preparatory/upgrading and community service programs are more likely to transfer to university than graduates of business programs, who in turn are more likely to transfer than graduates of all other program areas at Seneca. Graduates of two- and three-year college programs are more likely to transfer to university than graduates of one-year credentials (Williams & McCloy, 2019).

Research within Seneca College has delved deeply into the academic, motivational, and service-usage factors that may influence whether a student transfers to university directly after college graduation. Previous research has found that, in addition to the characteristics reported at the provincial level, the most important driver of whether a graduate transfers to university is having a strong academic background, including both high school and college grades as well as English and math skills at college entry (McCloy, Steffler, Bain-Greenwood & Decock, 2017; McCloy & Williams, 2019). Having a parent with a degree also slightly increases the likelihood of transfer to university (Steffler, McCloy, & Decock, 2018). Students at college entry who indicate they have plans for university after graduation, and students who receive transfer advising at college entry, are far more likely to transfer, even when controlling for aspirations for transfer (McCloy, Baker, Williams, & Decock, 2017).

Analysis of the Ontario Graduate Satisfaction Survey has shown that transfer rates from college to university have been declining, in part due to an increase in the colleges' provision of degrees (McCloy, Steffler, & Decock, 2017a). Even so, transfer rates from Seneca to York and Ryerson remain significant, particularly within business program areas. Previous research involving Seneca and York, which entailed matching student records, found that between 2001 and 2012, 1,892 Seneca business students subsequently enrolled at York (Smith et al., 2016). More recent statistics from York indicate that between 2011 and 2015 approximately 116 students per year reported previous enrollment in a Seneca business program (York Seneca Partnership, 2017). Additionally, the KPI Graduate Survey shows that 82% of Seneca's business graduates who transfer to an Ontario university attend Ryerson or York. The survey also shows that of all graduates who transfer to Ryerson from Seneca, 70% come from

Seneca's business programs (CRSM internal analysis). Ryerson has also estimated that between 400 and 500 Seneca students transferred to Ryerson business programs during 2012 to 2017 (personal communication, Ryerson Registrar's Office).

## SUCCESS AFTER TRANSFER

A study of students who transferred from Seneca to York between 2001 and 2012 presented evidence that those who ultimately graduated from York were academically stronger throughout both college and university (Smith et al., 2016). Overall, the average sending GPA at Seneca was 73%, and the GPA obtained at York after transfer was 69%. Those who eventually graduated from York had a sending GPA at Seneca of 77% and a York GPA of 75%. In comparison, those who withdrew from York had a Seneca average of 69% and a York average of 59%.

Several characteristics were associated with graduation at York after transfer from Seneca. Students who were female, younger, non-Canadian citizens, and non-native English speakers were more likely to graduate. Those who received more transfer credit were more likely to graduate, but those who entered business or natural and applied science were less likely to graduate. Aspirations for university at the start of college and relatedness of program pre- and post-transfer had little or no influence on a student's likelihood to graduate from York (Smith et al., 2016).

A follow-up study, which used a subset of the York-Seneca dataset (developed for Smith et al., 2016) to analyze transfer to York from Seneca's Liberal Arts Transfer program, found similar results for the associations with graduation rate; however, high school grades were also included in the analysis. Interestingly, only Seneca grades and not high school grades were associated with subsequent grades at York (McCloy, Steffler, & Decock, 2017b).

In a similar study at Algonquin College, students who transferred from Algonquin to the University of Ottawa were more likely to persist to third year if they attended university full-time versus part-time, and if they entered engineering rather than health sciences. Pre-transfer grades and graduation status before transfer were not included in the models (Finnie et al., 2012).

## UNIVERSITY TO COLLEGE

Between 2015 and 2018, 16% of incoming non-international students at Seneca submitted a transcript from an Ontario university; among these students, 65% had graduated with a university credential prior to Seneca entry (Bogers, Cusson, & Staddon, 2019). Relative to other students at Seneca, students from university were more likely to be female (62% vs. 53%), older (25% vs. 18% over 25 years of age), and from a high-income neighbourhood (46% vs. 34% from the highest tercile). Overall, 32% entered a graduate certificate program and 42% entered a business program. Students predominately came from Toronto universities, with 29% from York, 22% from the University of Toronto, and 13% from Ryerson.

With the growth in degree offerings at Seneca, the option exists for Seneca to be a receiving institution for students interested in transferring from a university degree program to a college degree program. Overall, 15% of domestic students who entered a Seneca degree program between 2015 and 2018 submitted an Ontario university transcript (CRSM internal

analysis). For the business degree programs, the share who submitted a university transcript was higher at 22%.

The data on previous education from the submitted transcripts described above have only been in the Seneca information system since 2015, and therefore little is known about the success of these transfer students. Results from the Seneca-York study (Smith et al., 2016) for the years 2001 to 2012, showed that for students who transferred from York to Seneca, the average pre-transfer GPA at York was 64% and the average post-transfer GPA at Seneca was 76%. Those who subsequently graduated from Seneca had a higher average at York than those who did not (67% vs. 61%). Regression analysis showed that, overall, higher grades pre- and post-transfer led to an increased likelihood of graduating at Seneca. Socio-demographic factors and the relatedness between the pre- and post-transfer programs had little effect on graduation at Seneca.

In the study investigating transfer students between Algonquin and the University of Ottawa, leaving rates by the second year at Algonquin did not differ among those students who transferred from the University of Ottawa and those who entered Algonquin directly from high school (Finnie et al., 2012). However, once controlling for high school grades (which were higher in the university-to-college transfers), student transfers from university were more likely to have withdrawn by the second year at college.

## **TRANSFER AGREEMENTS AND POLICIES FOR SENECA BUSINESS STUDENTS**

### **SENECA TO YORK**

York University primarily accepts transfer students through its block transfer credit policy, in which a transfer student receives a set amount of credit for the number of semesters previously completed, provided a GPA of 3.0 was obtained (3.3 for Bachelor of Commerce entry) and the program is aligned and at a sufficient "academic level". All of Seneca's business diploma programs listed in Table 1 are considered "highly academic" by York. Graduates of three-year Business Administration diplomas can enter a Bachelor of Commerce degree and obtain 42 credits (almost 1.5 years of study), provided they have a GPA of 3.3 and a specified course in math at either the high school (MHF4U) or Seneca level. Graduates of Seneca's two-year business programs are eligible for 30 credits per year of study toward a Bachelor of Commerce degree. Policy for block transfer credit is intended to facilitate access to York's programs while reducing the need to assess individual applications or develop bilateral agreements with colleges.

Table 1. York University's block transfer credit pathways by Seneca program/terms completed

| College Program/Terms Completed             | Potential Credit from York | Other York Programs |   |
|---|----------------------------|---------------------|---|
|   |                            | Other York Programs | BCom Requirements   |
| Three-Year Advanced Diploma/6 or More Terms | 42 credits                 | 3.0 GPA             | 3.3 GPA & MHF4U* (Advanced Functions) or Seneca's Mathematics of Business and Finance and the Business Statistics courses.<br>Eligible Seneca programs (3-yr):<br>Business Administration - Entrepreneurship and Small Business<br>Business Administration - Financial Planning<br>Business Administration - Human Resources<br>Business Administration - International Business<br>Business Administration - Management<br>Business Administration - Marketing<br>Business Administration - Purchasing and Supply Management |
| <b>5 Terms</b>                              | 36 credits                 | 3.0 GPA             |   |
| <b>Two-Year Diploma/4 Terms</b>             | 30 credits                 | 3.0 GPA             | 3.3 GPA & MHF4U (Advanced Functions)* or Seneca's Mathematics of Business and Finance and the Business Statistics courses.<br>Eligible Seneca programs (2-yr):<br>Accounting and Payroll<br>Business - Insurance<br>Business - International Business<br>Business - Marketing<br>Financial Services - Client Services<br>Business   |
| <b>3 Terms</b>                              | 24 credits                 | 3.0 GPA             |   |
| <b>One-Year Certificate/2 Terms</b>         | 15 credits                 | 3.0 GPA             |   |
| <b>One Term</b>                             | 9 credits                  | 3.0 GPA             |   |

\*MHF4U (Advanced Functions): Grade 12 University preparatory math course in Ontario HS curriculum.

Sources: Seneca College website, <https://www.senecacollege.ca/dcto/guide/york-university.html>

York University website, <https://futurestudents.yorku.ca/transfer/college-transfers>

York also has two articulation agreements with Seneca for the two-year accounting diploma and the three-year accounting and finance diploma offered through Seneca.<sup>1</sup> Although the agreements have undergone several iterations, currently, those who have graduated since 2015 from the three-year accounting and finance diploma and achieved a C or above in every course completed are eligible for a block of up to 57 credits toward the Bachelor of Commerce honours degree program at York (four years). For graduates of the two-year accounting diploma, those who have graduated since 2015 and maintained a C or above in every course completed are granted 45 credits toward the Bachelor of Commerce honours

<sup>1</sup> See York University's website at: <https://futurestudents.yorku.ca/transfer/college-transfers/seneca>

degree program at York. Both articulation agreements require students to have graduated with a Seneca GPA of 3.0 or higher to be eligible for transfer to York.

## SENECA TO RYERSON

Ryerson’s approach to student pathways has focussed on general advanced-standing policies and procedures set by each faculty in conjunction with the Registrar and Admission Offices rather than formal bilateral agreements. Likely due to its polytechnic roots, Ryerson considers itself to have a public responsibility to facilitate these transfers. These policies have been in existence for decades, likely since Ryerson first had the authority to grant degrees in 1971 (personal communication, Registrar’s Office). Over the years, faculty monitored the performance of transfer students, and designed and modified reach-back courses dependent on students’ performance, changes to the college’s curriculum, and the requirement that 50% of the program was delivered at Ryerson (personal communication, Registrar’s Office, Ryerson). Ryerson considers itself to have particularly strong links with Seneca and characterizes the College’s curriculum as an “excellent fit”.

Ryerson’s admission requirements, unlike York’s, require the transfer student to have graduated, and often from a three-year diploma program. The minimum recommended GPA is a 3.0 /4.0, but is generally higher, and can vary each year on a competitive basis. The admission requirements for transfer from a college of applied arts and technology (CAAT) to Ryerson’s business programs are presented in Table 2.

Table 2. Ryerson admission requirements for transfer from Seneca

| <b>Ryerson Business Degree Program</b>  | <b>Admission Requirements for Transfer Students from a CAAT</b>   |
|---|---|
| Bachelor of Commerce – Business Technology (Degree completion)<br>2-Year Duration | Graduate of any CAAT three-year business program  |
| Bachelor of Commerce – Business Management (Direct Entry)                         | Graduate of any CAAT three-year business program enters third year of the program but may be required to take up to six additional reach-back courses dependent of specific course completion and grades from sending institution.<br>Direct entry major offerings include: Economics and Management Science, Entrepreneurship, Global Management, Law and Business, Human Resources Management, Marketing Management and Real Estate Management. Majors in each of Accounting and Finance were discontinued for direct entry programs in 2015. |
| Bachelor of Commerce – Retail Management (Direct Entry)                           | Seneca graduates of Fashion Business (two-year diploma) and Fashion Business Management (three-year diploma) with a GPA of 3.0 enter third semester with some reach-back courses required. Graduates of the three-year program may be eligible for additional transfer credit.  |
| Bachelor of Commerce (Honours) – Hospitality and Tourism Management               | Graduates of a variety of Seneca’s Hospitality and Tourism programs are eligible for admission and can apply for individual course transfer credit.   |

Sources: Seneca College website: <https://www.senecacollege.ca/dcto/guide/ryerson-university.html>

Ryerson University website: <https://www.ryerson.ca/admissions/undergraduate/requirements/transfer-student/>

## UNIVERSITY TO SENECA PATHWAYS

Primary pathways for both university students and graduates into Ontario colleges include graduate certificate programs (which require a degree or diploma) as well as concurrent, collaborative, and accelerated diploma programs. Within business, Seneca offers a concurrent program with York in creative advertising and 17 graduate certificates in business. However, currently there are no block credit transfer pathways for university students transferring to Seneca,<sup>2</sup> and therefore transfer credits from universities are assessed primarily on a course-by-course basis. University courses may be eligible for transfer credit at college if the student achieved the minimum grade requirement: a C for students transferring to non-degree programs and a C+ for students transferring to college degree programs.

# Methodology

## STUDY POPULATION

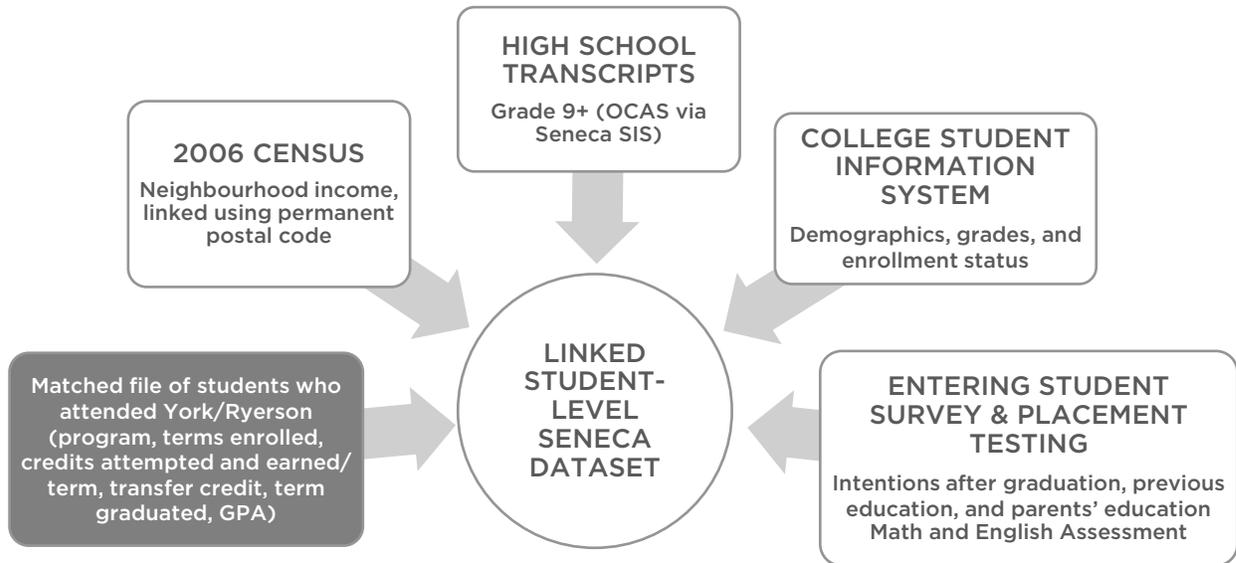
The sample for the study included all Seneca students who enrolled in a business program at Seneca and earned at least one course credit during 2012–13 to 2016–17 (n = 24,610). Students were excluded from the study sample if they had first enrolled at Seneca prior to 2007. To match student records and combine data between Seneca, York and Ryerson, the three institutions became joint signatories to data sharing and confidentiality agreements. Following approval from the Research Ethics Board (REB), Seneca securely transmitted to York and Ryerson the personal identifiers (Ontario Education Numbers [OEN], full name, date of birth, postal code) for each of the 24,610 Seneca business students included in this study.

York and Ryerson separately identified students within the study sample who had enrolled in a degree program at their respective institutions during 2007 to 2018 through a matching procedure based on students' personal identifiers. The universities then extracted data for each matched student, including: the program(s) enrolled in, credits attempted and earned per term, amount of transfer credit awarded upon university entry (from Seneca and other), first language (for York only), term and cumulative GPA, graduation status, and program of graduation. Seneca merged the extracted data with the College's previously created linked data file (Figure 1) for all Seneca students. This linked data file includes student demographics, Seneca grades and enrollment status (from the college student information system), entering-student survey responses and placement test results, high school courses and grades, and neighbourhood income data from the 2006 census.

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<sup>2</sup> There are several agreements for college diploma graduates to transfer to Seneca degree programs, for both Seneca and non-Seneca students.

Figure 1. Data sources included in Seneca’s linked student-level dataset



### HIGH SCHOOL RECORDS

For every Seneca student who attended an Ontario high school, the College’s student information system contains one record for every high school course taken in Grades 9 through 12. The overall senior high school average was calculated from all Grade 11 and 12 courses for those students who had a minimum of six Grade 11 or 12 courses. The total number of failed Grade 11 or 12 high school courses was calculated to better indicate whether the student struggled in high school. A variable was also generated to identify whether a student took mainly university preparation courses or college preparation courses, defined as “mostly U” and “mostly C”, respectively.<sup>3</sup> A student was classified as having taken “mostly U” high school courses if a minimum of half of the Grade 11 or 12 courses taken were of a university (U) or university/college (M) type.

### NEIGHBOURHOOD INCOME

As an estimate of individual student household income, the student’s permanent postal code was matched to household income data from the 2006 census.<sup>4</sup> Using the six-digit permanent postal code in the College’s student information system, each student from Ontario was assigned to a 2006 Dissemination Area (DA) using a 2011 Statistics Canada postal code conversion file (PCCF). If a student’s permanent postal code was missing or invalid, the Ontario high school postal code was used. A student’s neighbourhood income

<sup>3</sup> See Ontario Ministry of Education (2011), *The Ontario Curriculum Grades 9 and 12. Course descriptions and prerequisites*, <http://www.edu.gov.on.ca/eng/document/curricul/secondary/descript/descri9e.pdf>

<sup>4</sup> The 2006 census was used here because the 2011 census was non-mandatory and considered unreliable.

group was derived by splitting the DAs into income terciles of low, medium and high, based on the average pre-tax household income for Ontario households.

### ENTERING STUDENT SURVEY

During the mandatory placement testing, all entering Seneca students must complete a background survey (BDAT), which enquires about the following topics:

- University aspirations upon entry to the College: “After graduation from my program, I plan to”
- Previous university: “The last school I attended was”
- First language: “The language I learned first was” and
- Whether either parent has a university degree: “The highest level of education completed by my father (mother) / guardian is” (two separate questions for each parent).

The study generated a variable for a student's parent's education by combining the respondents who reported not knowing either parent's education with respondents categorized as having “no degree” (Steffler, McCloy, & Decock, 2016). If two or more completed surveys existed, the earliest record was used to reflect a student's true entering status. The “previous university” variable is limited in scope because entering students are only asked about the last school they attended and not whether they have ever attended university or have completed a credential at another institution.

### PROGRAM OF ENTRY

For the purposes of analysis, the program a student entered at their initial post-secondary institution and the program following transfer, were grouped according to specialization (at Seneca) or major field of study (at York and Ryerson). Each university provided “specialization major” (SPEMAJ) categories for each of their programs. For regression analysis, the SPEMAJ categories were then converted into three academic groupings: business and economics, natural and applied sciences, and social sciences and humanities (Appendix A, Table A 1). For Seneca, the specific Seneca business faculty was used for each academic grouping, except for some of the smaller faculties, which were combined (Appendix A, Table A 2). The Seneca dataset also categorized students as entering either a one-year certificate, two-year diploma, three-year diploma, four-year degree, or one-year graduate certificate program.

### COLLEGE ENGLISH AND MATH ASSESSMENT TESTING

Until recently, most business diploma and certificate programs at Seneca required entering students to take the computerized placement test, Accuplacer, for arithmetic and/or algebra.<sup>5</sup> The placement test assesses the college numeracy and math proficiency level of students entering a college program requiring math. Based on the test results, students may or may not be placed in a non-credit foundation math course during their first year of college. Entering students also had to complete the Accuplacer placement test for reading

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<sup>5</sup> Starting in the fall of 2019, the Ontario Colleges Math Test replaced Accuplacer at Seneca. Seneca also phased out language assessment testing, including Accuplacer for reading comprehension, in the fall of 2019.

comprehension, though the results were rarely used to determine course placement. For analysis in the study, Accuplacer’s established proficiency levels were used (Table 3).

Table 3. Accuplacer proficiency levels<sup>6</sup>

| Arithmetic           | Score / 120 | Algebra                   | Score / 120 | Reading Comprehension | Score / 120 |
|----------------------|-------------|---------------------------|-------------|-----------------------|-------------|
| Below Minimal Skills | 20–30       | Below minimal pre-algebra | 20–24       | Low                   | 20–50       |
| Minimal Skills       | 31–56       | Minimal pre-algebra       | 25–56       | Minimal               | 51–77       |
| Basic Skills         | 57–89       | Minimal elementary        | 57–75       | Adequate              | 78–98       |
| Adequate Skills      | 90–111      | Sufficient elementary     | 76–107      | Sufficient            | 99–120      |
| Substantial Skills   | ≥112        | Substantial elementary    | ≥108        |                       |             |

## GRADES

Grades before transfer were calculated as the average of all credit courses ever taken at the respective institution up until the student transferred, whereas grades after transfer were the average of all courses at the receiving institution following transfer. GPAs were grouped into four categories that correspond to the grade letters A, B, C, or D & below, based on grading schemes provided on each institution’s website (Table 4). Seneca’s grading scheme was adapted to provide a grade range for the A category (3.75 to 4.0 instead of 4.0). For the descriptive analysis, the actual GPA from the institution was reported. However, the letter grade was used for the regression models with multiple grading schemes, with a grade of B or above (a “good grade”) as the binary outcome.

Table 4. Grading schemes at York, Ryerson and Seneca

| Description              | Grade | Per Cent Range | Seneca GPA, 4pt Scale | York GPA, 9pt Scale | Ryerson GPA, 4.33pt Scale |
|--------------------------|-------|----------------|-----------------------|---------------------|---------------------------|
| Marginal/ Unsatisfactory | D/F   | <60%           | <2                    | <4                  | <1.67                     |
| Satisfactory/ Competent  | C     | 60-69%         | 2- <3                 | 4- <6               | 1.67-<2.67                |
| Good                     | B     | 70-79%         | 3- <4.0*              | 6.0-<8.0            | 2.67-<3.67                |
| Excellent                | A     | 80-100%        | 4*                    | 8.0-9.0             | 3.67-4.33                 |

\* For analysis, Seneca’s A was a GPA of 3.75 to 4.0.

## PROGRESS TO GRADUATION

The descriptive analysis investigated graduation status (withdrew, still enrolled, or graduated) by pathway for one and two years after transfer. For Seneca students, the analysis investigated the percentage who graduated two or three years after transfer. For university students transferring to Seneca, the complication of a variety of credential durations necessitated reporting the share of students who either were still enrolled, or graduated two or three years after transfer was reported, and the share who graduated within the standard program length. For York and Ryerson, the outcome was defined as whether the student was either still enrolled or graduated one year after transfer. For Seneca, the outcome was defined

<sup>6</sup> The College Board (2016), ACCUPLACER Program Manual, <https://secure-media.collegeboard.org/digitalServices/pdf/accuplacer/accuplacer-program-manual.pdf>

as whether the student graduated within the standard program length for the student's credential of enrollment.

### **USE OF SENECA'S DEGREE AND CREDIT TRANSFER OFFICE (DCTO)**

Seneca's Degree and Credit Transfer Office provides one-on-one transfer advising to Seneca students and other transfer-related services (McCloy, Baker, Decock, & Williams, 2017). Prior to the first advisement appointment, the student completes an appointment card which, which collects information the student's name and ID and other information. The student ID flags whether or not the student received transfer advising, and is linked to the Seneca-York-Ryerson database created for this study.

### **TRANSFER CREDIT**

Both York and Ryerson provided data on the amount of transfer credit students received upon entering each university for courses completed at other post-secondary institutions.

For York, the total amount of transfer credit awarded upon starting at York University was defined as the sum of all credit awarded for a student's academic history for all Ontario colleges and universities on record. The total amount of transfer credit awarded upon starting at Ryerson University was defined as the sum of all credit awarded for a student's academic history for all institutions on record. However, as described earlier, students entering via a direct entry or degree completion pathway enter at an upper semester or are admitted directly to the two-year degree completion program, instead of being assigned transfer credit.

To harmonise Ryerson's approach with York's, an estimate of transfer credit was generated based on the typical number of credits in the first years of Ryerson's degrees. For students entering Business Management degrees (full or part time) at the "5D" term (5th semester, through Ryerson's direct transfer pathway), an additional 16 credits were added to the total number of transfer credits (maximum of 6 reach-back courses) awarded on the student's record. For students entering Business Technology (two-year degree completion program, full or part time), an additional 22 credits were added to the total number of transfer credits awarded on the student's record to indicate the equivalent of two years of advanced standing received for the college diploma. Finally, as an additional rule, for any other program of entry at Ryerson, students who entered an advance semester (semester 3 starts) but with no transfer credit on record, were assigned 11 credits.

Data on transfer credit awarded to incoming Seneca students were only available from the start of the 2015 academic year onward; therefore, the data were not used in any of the analyses.

### **ANALYTIC METHODS**

The current study presents the results of both descriptive and regression techniques. Descriptive results for each outcome of interest are presented by selected characteristics. To control for the independent effects of variables, regression models were used for each outcome of interest. Linear regression was used when the outcome of interest was a continuous variable, whereas logistic regression was used when the outcome of interest was a

dichotomous variable. For all regression analyses, the dataset was restricted to individuals with complete data for all variables included in the regression model. The model-building methodology is described in Appendix B.

For each outcome of interest, four sub-populations were analyzed:

1. The first sub-population was the base population, which included all students with data for socio-demographic and program-related variables including: gender, age, status in Canada, GPA, program, credential, DCTO use, graduation status, and transfer credit (from York).
2. The second sub-population included all variables as in the first sub-population with the addition of high school data. The addition of high school variables required the exclusion of all international students and those who did not submit high school grades to Seneca upon college entry. Additionally, this sub-population included neighbourhood income data.
3. The third sub-population included all variables as in the first sub-population with the addition of Seneca's English assessment scores. This sub-population included international students. Seneca assessment testing was completed for all students entering Seneca's one-year certificate, two-year diploma, and three-year advanced diploma programs; and therefore this sub-population excluded all students entering Seneca's graduate certificate and degree programs.
4. The fourth sub-population included all variables in the third sub-population, with the addition of Seneca math assessment scores.

## Results

### DESCRIPTIVE ANALYSIS

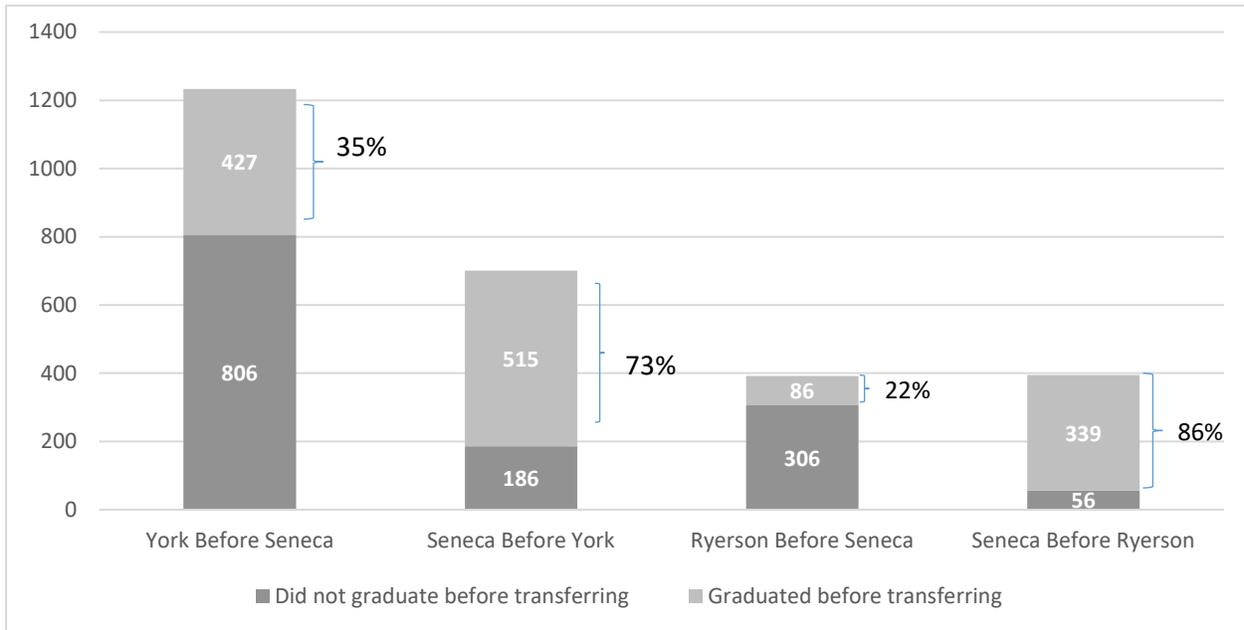
#### STUDENT CHARACTERISTICS AND MOTIVATIONS BY PATHWAY

The study population included any student who had enrolled in a Seneca business program during fall 2012 to winter 2017, totaling 24,610 students. Almost 11% of this group attended either York or Ryerson between 2006-07 and 2017-18, and 0.2%<sup>7</sup> attended all three institutions. Figure 2 contains the breakdown of the numbers of students who transferred by pathway, as well as the percentage who graduated before transfer. Students transferring from university to Seneca were mostly non-graduates, with only 35% from York, and 22% from Ryerson, graduating before transfer. However, 73% of Seneca students who transferred to York, and 86% who transferred to Ryerson, graduated before transferring.

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<sup>7</sup> These students were included for each of the institutions they attended; for example, students who attended Ryerson, followed by Seneca, then York, were included in both the Ryerson-Seneca analysis and the Seneca-York analysis. In cases where the populations were analysed together, the pathway was affixed to the first transition.

Figure 2. Number of transfers by pathway



Note: Includes any Seneca student who entered a business program at Seneca between 2012 and 2016-2017, and had enrolled in York or Ryerson any time between 2007 and 2017-18.

Table 5 presents distinct socio-demographic characteristics of students by transfer pathway. Differences in gender distribution by pathway are shown by both institution and direction of transfer.

Almost 60% of students originating from York were female, whereas the share of female students going from Seneca to York was similar to the share in the overall business student population (52%). Students who either came from or continued on to Ryerson were more likely to be male than students for other pathways (54% to 56%).

The age distribution at the time of entry to Seneca’s business programs also showed distinct patterns by pathway. Overall, Seneca’s business student population skewed older, with only 43% of students starting at age 20 or under. Students who eventually continued on to York or Ryerson were much younger, particularly those continuing on to Ryerson (71% were 20 years of age or under at Ryerson compared to 58% at York). For university students entering Seneca, Ryerson students were markedly younger than York students, with 42% under 21 years of age compared to only 20% from York.

Age differences aside, the socio-demographic characteristics of students entering Seneca from York or Ryerson were similar to those of the general student population at Seneca. With regard to status in Canada, a large share of business students at Seneca were international (36%). Students who continued on to York from Seneca were the most similar to the overall Seneca population compared to other transfer pathways investigated, with an almost equal share of international students (42%) and Canadian students (41%). Additionally, only 24% of students who transferred from Seneca to York reported English as a first language, which is less than half of the proportion of students who reported English as a first language among all other transfer pathways investigated and the overall Seneca population. The vast majority of students originating from York or Ryerson were Canadian citizens (84% and 89%), with the

highest proportion of students who were identified as permanent residents<sup>8</sup> being those who transferred from Seneca to Ryerson (18%). Students who came to Seneca from York or Ryerson were more likely to report having a parent with a degree (42% and 44%, respectively) and to come from a higher-income neighbourhood (44%) than the non-transfer population (37%).<sup>9</sup> Compared to the Seneca non-transfer students, students who transferred to York or Ryerson from Seneca were slightly more likely to report having a parent with a degree, and had a similar neighbourhood income distribution.

Table 5. Socio-demographic characteristics of students by transfer pathway

|  |                  | Non-Transfers (Seneca Only) | York Before Seneca | Ryerson Before Seneca | Seneca Before York | Seneca Before Ryerson | Total Seneca Population |
|--|------------------|-----------------------------|--------------------|-----------------------|--------------------|-----------------------|-------------------------|
|  |                  | 21,922                      | 1,233              | 392                   | 701                | 395                   | 24,610                  |
| <b>Gender</b>                                  | Female           | 51.8%                       | 59.7%              | 46.4%                 | 51.5%              | 44.3%                 | 52.0%                   |
|  | Male             | 48.0%                       | 40.3%              | 53.6%                 | 48.5%              | 55.7%                 | 47.9%                   |
| <b>Start Age in Business Program at Seneca</b> | <19              | 18.1%                       | 1.1%               | 2.0%                  | 23.3%              | 33.7%                 | 17.4%                   |
|  | 19-20            | 25.1%                       | 18.6%              | 39.8%                 | 34.4%              | 37.7%                 | 25.5%                   |
|  | 21-22            | 18.6%                       | 27.3%              | 25.8%                 | 21.7%              | 13.2%                 | 19.2%                   |
|  | 23-24            | 13.5%                       | 29.0%              | 20.9%                 | 8.3%               | 6.1%                  | 14.1%                   |
|  | 25+              | 24.7%                       | 24.0%              | 11.5%                 | 12.4%              | 9.4%                  | 23.9%                   |
| <b>Status in Canada</b>                        | International    | 37.7%                       | 11.6%              | 5.6%                  | 42.4%              | 10.6%                 | 35.6%                   |
|  | Canadian Citizen | 49.6%                       | 83.6%              | 88.8%                 | 41.2%              | 71.9%                 | 52.0%                   |
|  | Domestic - Other | 12.8%                       | 4.8%               | 5.6%                  | 16.4%              | 17.5%                 | 12.4%                   |
| <b>English - First Language</b>                |                  | 41.6%                       | 41.4%              | 56.7%                 | 24.1%              | 52.6%                 | 41.3%                   |
| <b>Neither Parent Has a Degree</b>             |                  | 68.0%                       | 58.4%              | 56.0%                 | 63.7%              | 65.4%                 | 67.3%                   |
| <b>Neighbourhood Income Group</b>              | Low Income       | 30.1%                       | 25.3%              | 20.1%                 | 27.3%              | 29.8%                 | 29.5%                   |
|  | Mid Income       | 32.6%                       | 30.6%              | 35.9%                 | 31.4%              | 34.2%                 | 32.5%                   |
|  | High Income      | 37.3%                       | 44.2%              | 44.0%                 | 41.3%              | 36.0%                 | 38.0%                   |

Notes: (1) Data on English as a first language and parent's education is from a survey that is not administered to those in degree or graduate certificate programs. York, however, also had student's first language as a field in its information system and therefore supplemented this variable when missing at Seneca. (2) In total, 42 students attended all three institutions and are included in each column: 9 students overlapped with Seneca and York in their enrollment, and 2 overlapped with Ryerson and are not included in the pathway columns. (3) Neighbourhood income excludes international students.

Seneca's entering student survey asks students to indicate their main reason for attending Seneca. Table 6 presents the results by student pathway. Overall, students most commonly indicated that they chose to attend Seneca because of available programs of interest and career advancement opportunities. However, these reasons differed by transfer pathway.

<sup>8</sup> In Table 5, permanent residents are labeled as "domestic-other," which includes, in addition to permanent residents, any other students whose status enables them to be eligible for domestic tuition fees.

<sup>9</sup> Interestingly, results from the National Survey of Student Engagement show both York and Ryerson have a higher percentage, with more than half of their first-year students reporting that at least one of their parents has a degree. Sources: York University, Office of Institutional Planning and Analysis, custom calculation; and Ryerson University, <https://www.ryerson.ca/upo/reports/undergrad/nsse/>.

Students entering Seneca after attending York or Ryerson were somewhat more likely to cite career reasons (after first-choice program availability) as the reason they chose Seneca. About one third of students who eventually transferred from Seneca to York or Ryerson cited university preparation as their main reason for choosing Seneca. Within the group of students who transferred to Ryerson or York, Ryerson transfers were more likely to cite first-choice program availability, whereas York transfers were more likely to cite career advancement. Ryerson students who transferred in both directions were also more likely to cite the proximity of Seneca’s campus to their home compared to York students who transferred in both directions. Overall, the general transfer population was less likely than the non-transfer population to cite Seneca’s faculty reputation as a reason to choose Seneca.

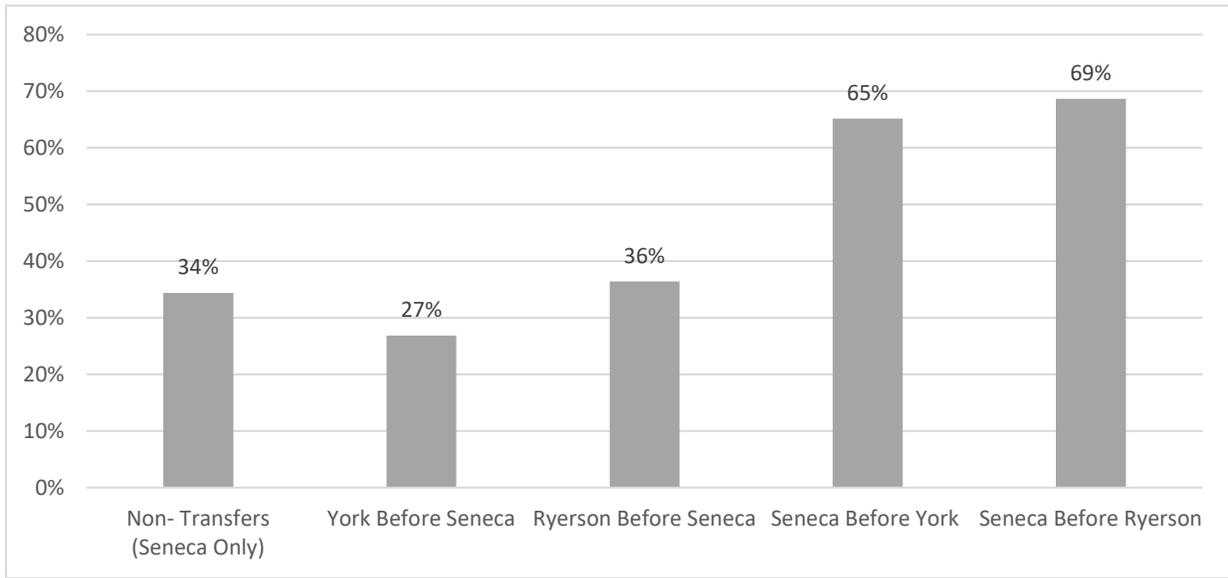
Table 6. Top reasons for choosing Seneca by transfer pathway

|   | <b>Non-Transfers (Seneca Only)</b> | <b>York Before Seneca</b> | <b>Ryerson Before Seneca</b> | <b>Seneca Before York</b> | <b>Seneca Before Ryerson</b> | <b>Total Seneca Population</b> |
|---|------------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|--------------------------------|
| <b>First choice program was available</b> | 29%                                | 31%                       | 25%                          | 16%                       | 25%                          | 28%                            |
| <b>To further advance my career</b>       | 21%                                | 29%                       | 26%                          | 21%                       | 12%                          | 22%                            |
| <b>To prepare for university</b>          | 13%                                | 9%                        | 15%                          | 35%                       | 31%                          | 13%                            |
| <b>Good reputation of the faculty</b>     | 13%                                | 9%                        | 9%                           | 8%                        | 6%                           | 13%                            |
| <b>Campus is close to home</b>            | 11%                                | 12%                       | 14%                          | 7%                        | 16%                          | 11%                            |
| <b>Family/friends attended Seneca</b>     | 8%                                 | 6%                        | 7%                           | 6%                        | 5%                           | 8%                             |
| <b>Seneca's campus is attractive</b>      | 6%                                 | 4%                        | 4%                           | 6%                        | 5%                           | 6%                             |

Note: Students who entered degree and graduate certificate programs at Seneca are excluded.

The entering survey asked Seneca students about their plans post-graduation, with one option being plans to attend university. For students who eventually went on to Ryerson or York, two thirds had plans for university upon college entry (Figure 3). Interestingly, even students who were entering Seneca after previous enrollment at York or Ryerson (27% and 36%, respectively) indicated they had plans to attend university after graduation from Seneca. This may indicate that some students who struggled in university envisioned graduating from college as a pathway back to university.

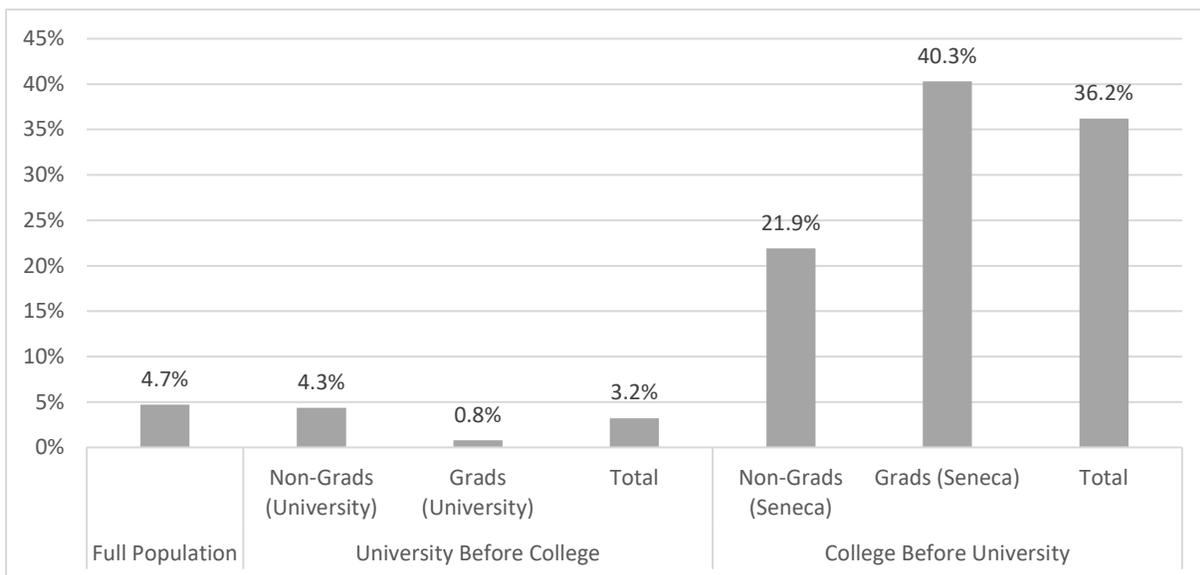
Figure 3. Percentage of students at college entry aspiring to attend university after college graduation, by transfer pathway



Note: Students who entered degree and graduate certificate programs at Seneca are excluded.

Seneca’s Degree and Transfer Office (DCTO) provides one-on-one advising for students planning to continue on to a college or university degree program. For the current study, the DCTO’s dataset of all students who visited the DCTO was merged with our linked student dataset. The results show that a large share of Seneca students who transferred to York or Ryerson sought out transfer advising (36%), and that those who graduated from their college program before transferring were much more likely to use the DCTO’s advising services (40% vs. 22%). Additionally, those who continued on to Ryerson were more likely to have received advising than those who went on to York (42% vs. 33%, data not shown). As expected, a minimal use of advising services was observed for students transferring to Seneca from York or Ryerson (3.2%).

Figure 4. DCTO use among study population by transfer pathway and graduation status prior to transfer



## ACADEMIC BACKGROUND

Table 7 presents the high school academic background for the study population by transfer pathway and graduation status pre-transfer. Overall, university-to-Seneca transfers had stronger high school academic backgrounds than non-transfers and college-to-university transfers. However, within the university-to-college transfer population, university non-graduates had weaker high school academic backgrounds than those who graduated from university. Only 71% of students who transferred from university to Seneca without graduating had an average of  $\geq 70\%$  (compared with 83% for those who graduated), and 17% had failed three or more courses in high school. However, Seneca graduates and Seneca non-graduates who transferred to York or Ryerson had similar high school backgrounds. The one exception, however, were the students who went on to York or Ryerson without graduating from Seneca: they were more likely to have taken university preparation courses in high school, which was associated with university eligibility (85% and 68%, respectively). Therefore, students who transferred from Seneca to university without graduating from Seneca prior to transfer may have gained entry to university solely on the basis of their high school grades.

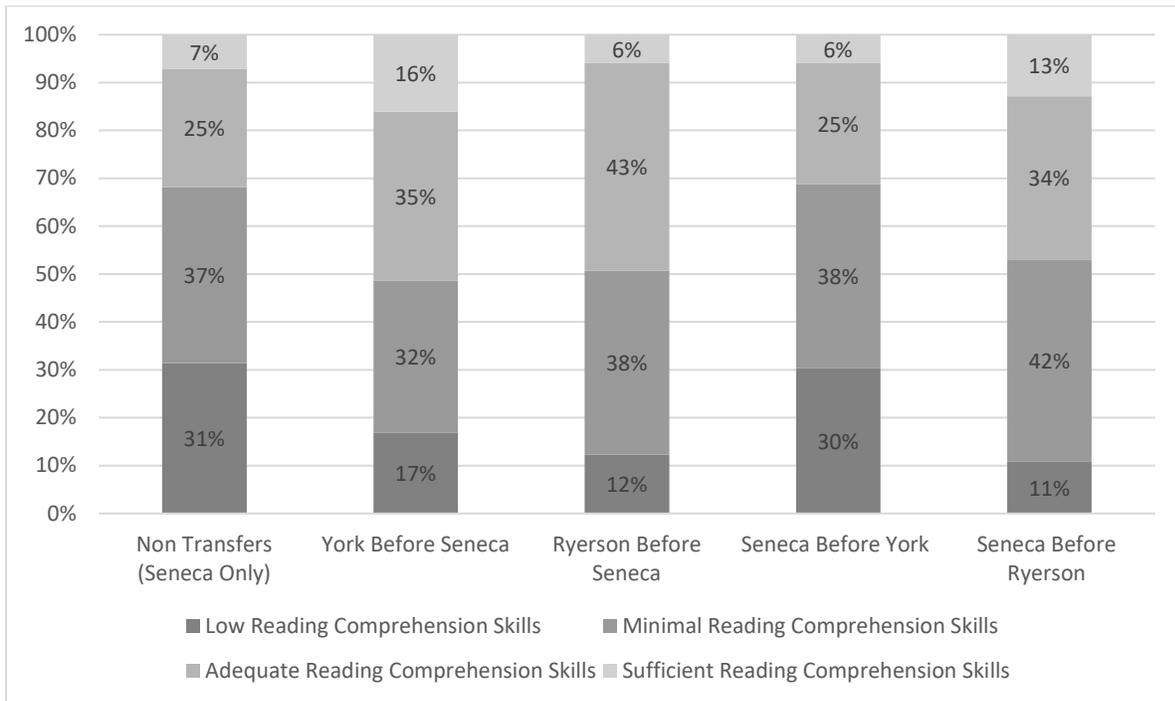
Table 7. High school academic background by transfer pathway and graduation status prior to transfer

|   |             | University Before College |                       | College Before University |                   |                   |
|---|-------------|---------------------------|-----------------------|---------------------------|-------------------|-------------------|
|   |             | Non-Grads<br>(University) | Grads<br>(University) | Non-Grads<br>(Seneca)     | Grads<br>(Seneca) | Non-<br>Transfers |
| <b>Total Sample with HS Grades</b>          |             | 681                       | 210                   | 131                       | 392               | 9,079             |
| <b>% Sample with HS Grades</b>              |             | 71.5%                     | 42.0%                 | 75.7%                     | 67.8%             | 66.4%             |
| <b>&gt;50% Senior HS Courses</b>            | Yes         | 97.2%                     | 98.0%                 | 84.7%                     | 67.6%             | 61.9%             |
| <b>U/M/OAC Level</b>                        |             |                           |                       |                           |                   |                   |
| <b>HS Average (All Grade 11/12 Courses)</b> | <60%        | 1.3%                      | 0.0%                  | 3.1%                      | 1.8%              | 5.8%              |
|   | 60-69%      | 27.9%                     | 17.1%                 | 44.3%                     | 41.6%             | 43.7%             |
|   | 70-79%      | 57.1%                     | 60.0%                 | 35.9%                     | 43.9%             | 39.7%             |
|   | $\geq 80\%$ | 13.7%                     | 22.9%                 | 16.8%                     | 12.8%             | 10.8%             |
| <b>Number of Failed Grade 11/12 Courses</b> | 0           | 59.8%                     | 71.4%                 | 63.4%                     | 58.2%             | 55.9%             |
|   | 1-2         | 23.2%                     | 24.3%                 | 16.0%                     | 23.2%             | 24.2%             |
|   | $\geq 3$    | 17.0%                     | 4.3%                  | 20.6%                     | 18.6%             | 19.9%             |
| <b>Eligible for University</b>              | Yes         | 80.8%                     | 86.2%                 | 42.0%                     | 28.8%             | 25.0%             |

Notes: (1) International students at Seneca are excluded. (2) HS: high school.

To assess whether incoming Seneca business students (certificate and diploma programs) are prepared for college-level math and English courses, Seneca requires students to complete placement testing upon college entry. Figure 5 shows that among students transferring from York or Ryerson to Seneca, only half had either “adequate” or “sufficient” skills in reading comprehension. For students who transferred from Seneca to university, those who continued on to Ryerson had much stronger skills in reading comprehension, which is likely associated with the much larger share who reported English as their first language.

Figure 5. Seneca reading comprehension assessment scores upon Seneca entry, by transfer pathway



Notes: (1) Students who entered degree and graduate certificate programs at Seneca are excluded. (2) Given that students entering graduate certificate programs do not undergo skills assessment, 93% of the university-to-college sample presented in the current figure had not graduated from university.

Students’ math assessment scores at Seneca entry differed from reading comprehension results by pathway (Table 8). Whereas students who originated at York or Ryerson outperformed the non-transfer population on Seneca’s math assessment tests for entering students, those who transferred from Seneca to York significantly outperformed students across all other transfer pathways. This outcome, in part, reflects the high proportion of Seneca to York transfers who were not Canadian citizens (59%). Previous research on Seneca students showed that non-Canadian citizens (both international students and permanent residents) had much stronger math skills than Seneca students with Canadian citizenship (McCloy & Williams, 2019). Math assessment scores by pathway and status in Canada is shown in Appendix C 2, clearly demonstrates the gap in math skills between Canadian and non-Canadian students at Seneca. However, it also shows that non-Canadian students who transferred to York have stronger math skills than non-Canadian students who transferred to Ryerson, indicating that math skills alone do not explain the differences in transfer pathway.

Table 8. Algebra and arithmetic assessment testing results by transfer pathway

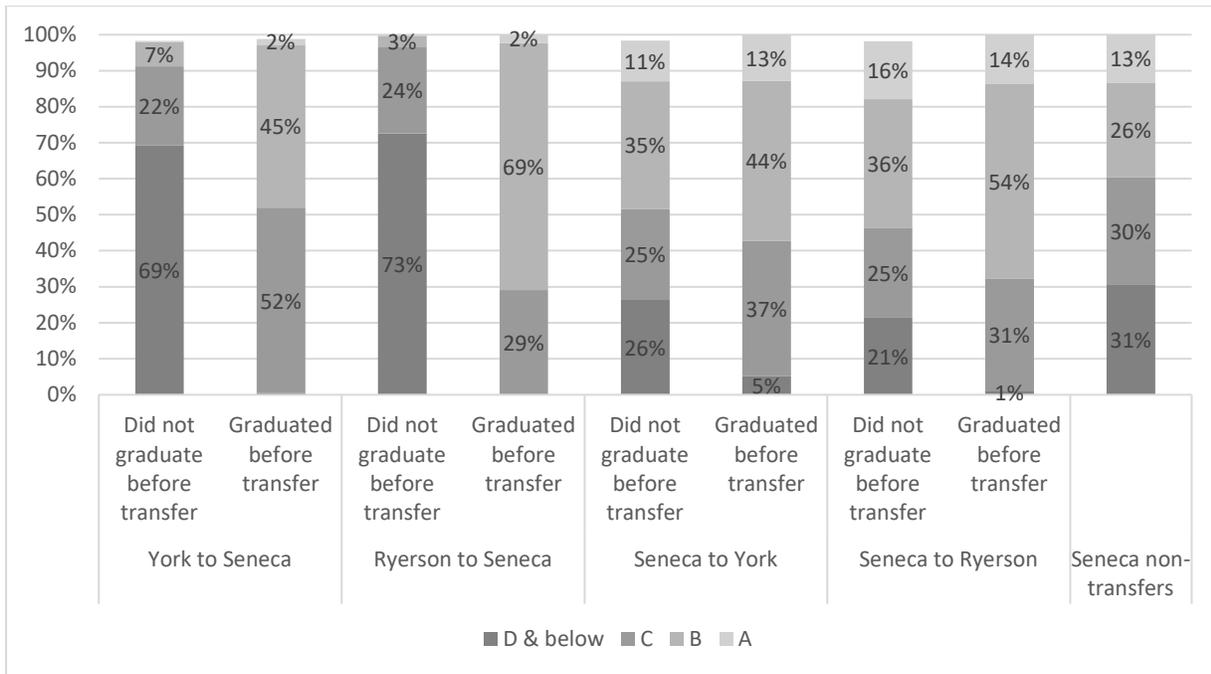
|   |                               | <b>Non-<br/>Transfers<br/>(Seneca Only)</b> | <b>York<br/>Before<br/>Seneca</b> | <b>Ryerson<br/>Before<br/>Seneca</b> | <b>Seneca<br/>Before<br/>York</b> | <b>Seneca<br/>Before<br/>Ryerson</b> |
|---|-------------------------------|---|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|
| <b>Total Sample with Arithmetic Scores</b>            |                               | 12,373                                      | 478                               | 173                                  | 526                               | 311                                  |
| <b>Arithmetic<br/>Proficiency<br/>Level</b>           | Below minimal skills          | 12%   | 10%                               | 9%                                   | 5%                                | 7%                                   |
|   | Minimal skills                | 21%   | 14%                               | 16%                                  | 12%                               | 18%                                  |
|   | Basic skills                  | 28%   | 30%                               | 29%                                  | 22%                               | 37%                                  |
|   | Adequate skills               | 26%   | 33%                               | 38%                                  | 39%                               | 26%                                  |
|   | Substantial skills            | 13%   | 14%                               | 8%                                   | 22%                               | 12%                                  |
| <b>Total Sample with Algebra Scores</b>               |                               | 11,645                                      | 453                               | 167                                  | 522                               | 310                                  |
| <b>Algebra<br/>Proficiency<br/>Level</b>              | Below minimal pre-<br>algebra | 5%  | 3%                                | 2%                                   | 2%                                | 2%                                   |
|   | Minimal pre-algebra           | 31%   | 25%                               | 25%                                  | 17%                               | 31%                                  |
|   | Minimal elementary            | 16%   | 15%                               | 17%                                  | 13%                               | 23%                                  |
|   | Sufficient<br>elementary      | 25%   | 32%                               | 39%                                  | 25%                               | 27%                                  |
|   | Substantial<br>elementary     | 22%   | 25%                               | 17%                                  | 43%                               | 17%                                  |
| <b>Total Average Math Assessment<br/>Score (/120)</b> |                               | 73.3  | 79.3                              | 78.2                                 | 89.2                              | 75.0                                 |

Notes: (1) Students who entered degree and graduate certificate programs at Seneca are excluded. (2) 94% of the university-to-college transfers who took a math assessment test had not graduated from university.

Figure 6 presents students pre-transfer grades by pathway. Students who transferred from York or Ryerson to Seneca without a credential had weak academic backgrounds, with 69% of non-graduates from York and 73% of non-graduates from Ryerson having an average of D or below. University graduates had much stronger grades, with Ryerson transfers more likely than York transfers to attain an average of B or above (71% vs. 47%).

Seneca students who transferred to York or Ryerson had better grades than those who did not continue on to either institution. Among those who transferred, students who had graduated before transferring to York or Ryerson, versus those who had not graduated, had stronger grades at Seneca. Seneca graduates who transferred to Ryerson were more likely than those who went on to York to have a B average or above (68% vs. 57%).

Figure 6. Grades at sending institution prior to transfer, by transfer pathway and graduation status



Note: Grades are the average of all grades at an institution up until the transfer point.

### PROPENSITY TO TRANSFER TO UNIVERSITY

This section presents the various characteristics of Seneca business students who continued on to Ryerson or York (students transferring from Ryerson or York are excluded).

The results show that older students, international students, and those who reported English as their first language are less likely to transfer, whereas students with a university-educated parent are somewhat more likely to transfer (Figure 7, Table 9). Accounting and finance students and those in three-year diploma programs are also more likely to transfer to university, with those in public administration or hospitality and tourism programs the least likely (Figure 8). As would be expected, having plans for university at entry, or receiving transfer advising at the DCTO, was positively associated with the likelihood of transfer to university (Table 9).

Overall, academically stronger students are more likely to continue on to university (Figure 9, Table 9). Students who take university preparatory courses in high school, obtain good grades in both high school and at Seneca, and perform well in assessment testing (particularly in math) at Seneca are more likely to transfer to Ryerson or York. Interestingly, those who report that their last school was university do not differ in their rate of transfer to York or Ryerson.

Figure 7. Proportion of Seneca business students who transferred to York or Ryerson by gender, age, and status in Canada at Seneca entry

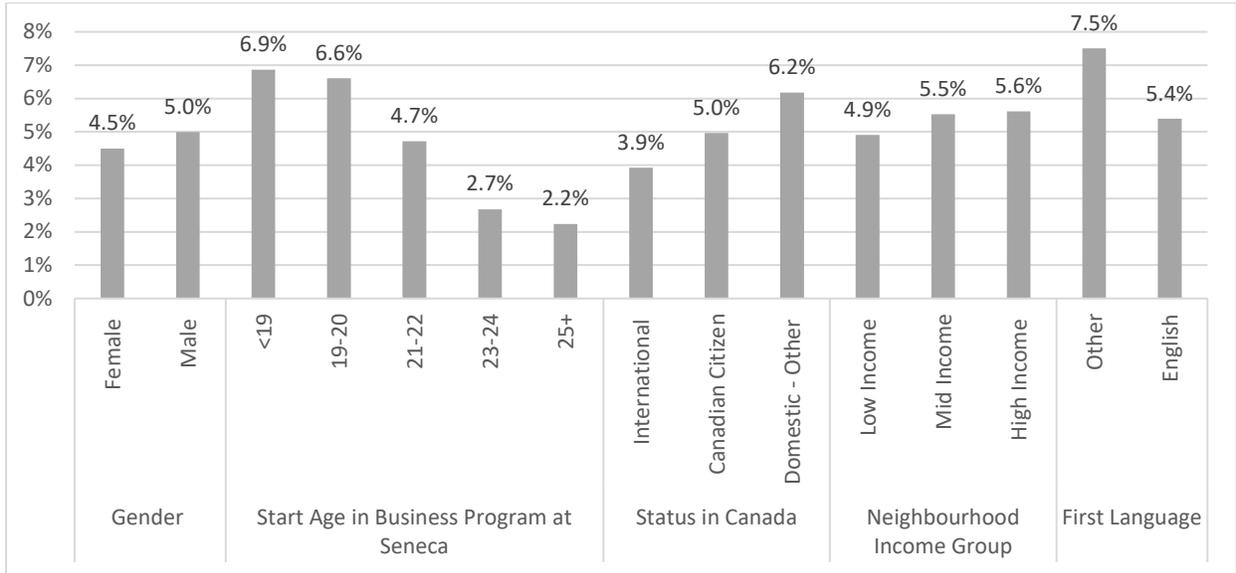


Figure 8. Proportion of Seneca business students who transferred to York or Ryerson by Seneca first business program area and credential

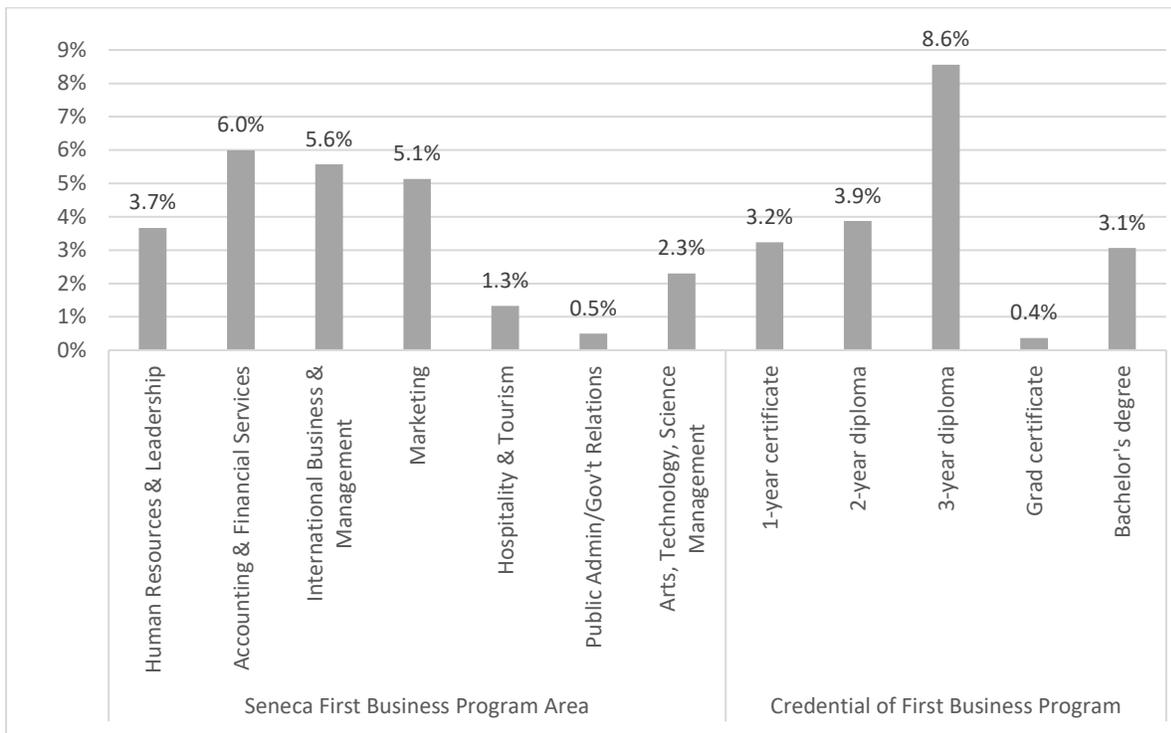
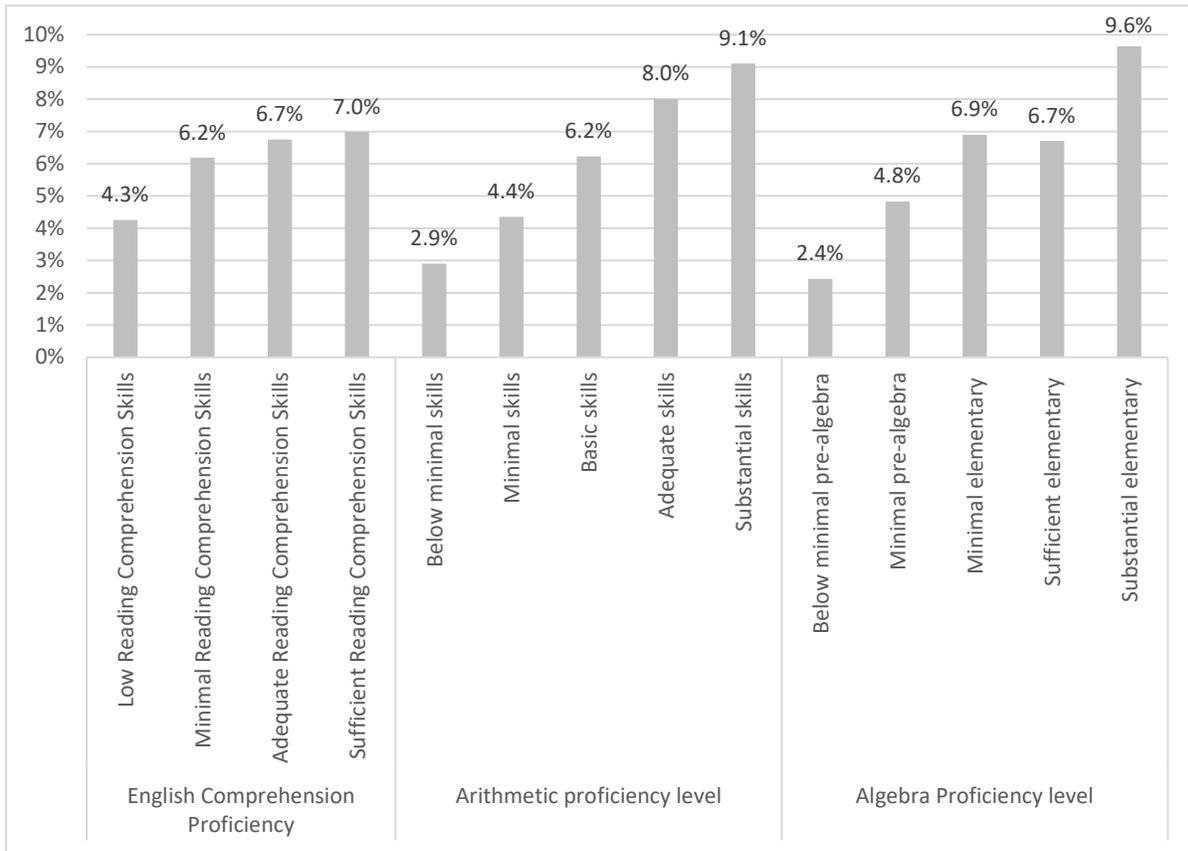


Figure 9. Proportion of Seneca business students who transferred to York or Ryerson by Seneca-entry assessment scores



Note: Students who entered degree and graduate certificate programs at Seneca are excluded.

Table 9. Proportion of Seneca business students who transferred to York or Ryerson by selected student characteristics

|   |             | <b>Total<br/>Population (n)</b> | <b>Transfer to York or<br/>Ryerson (n)</b> | <b>%<br/>Transfers</b> |
|---|-------------|---------------------------------|--|------------------------|
| <b>&gt;50% Senior HS Courses U/M/OAC Level</b>                              | No          | 3,607                           | 147  | 4.1%                   |
|   | Yes         | 5,985                           | 376  | 6.3%                   |
| <b>HS Average (All Grade 11/12 Courses)</b>                                 | <60%        | 534                             | 11   | 2.1%                   |
|   | 60-69%      | 4,192                           | 221  | 5.3%                   |
|   | 70-79%      | 3,813                           | 219  | 5.7%                   |
|   | ≥80%        | 1,052                           | 72   | 6.8%                   |
| <b>Number of Grade 11/12 Courses a<br/>Student Failed</b>                   | 0           | 5,379                           | 311  | 5.8%                   |
|   | 1-2         | 2,305                           | 112  | 4.9%                   |
|   | ≥3          | 1,908                           | 100  | 5.2%                   |
| <b>Eligible for University</b>  | No          | 7,164                           | 355  | 5.0%                   |
|   | Yes         | 2,428                           | 168  | 6.9%                   |
| <b>Seneca GPA, All Courses</b>  | <2          | 6,785                           | 90   | 1.3%                   |
|   | 2-3         | 6,894                           | 362  | 5.3%                   |
|   | 3-3.75      | 6,273                           | 496  | 7.9%                   |
|   | 3.75-4      | 3,044                           | 140  | 4.6%                   |
| <b>First Language</b>   | English     | 6,697                           | 361  | 5.4%                   |
|   | Other       | 9,319                           | 699  | 7.5%                   |
| <b>University Plan at Seneca Entry</b>                                      | No          | 10,116                          | 308  | 3.0%                   |
|   | Yes         | 5,744                           | 607  | 10.6%                  |
| <b>Was the Last School Attended a<br/>University or Degree Polytechnic?</b> | No          | 12,828                          | 744  | 5.8%                   |
|   | Yes         | 3,049                           | 173  | 5.7%                   |
| <b>Parent Has a Degree</b>  | No          | 10,622                          | 576  | 5.4%                   |
|   | Yes         | 5,255                           | 341  | 6.5%                   |
| <b>Used DCTO</b>  | Yes         | 1,107                           | 394  | 35.6%                  |
|   | No          | 21,886                          | 694  | 3.2%                   |
| <b>Neighbourhood Income Group</b>   | Low Income  | 5,802                           | 285  | 4.9%                   |
|   | Mid Income  | 6,553                           | 362  | 5.5%                   |
|   | High Income | 6,215                           | 349  | 5.6%                   |

Notes: (1) Data on English as a first language and parent's education are from a survey that is not administered to those in degree or graduate certificate programs. York, however, also had student's first language as a field in its information system and therefore supplemented this variable when missing at Seneca. (2) HS: high school.

Table 10 and Table 11 present the amount of transfer credit awarded to Seneca business students who transferred to York or Ryerson, by the amount of credit they accumulated at Seneca. Approximately half of the students who transferred to York had between two and three years of course credit at Seneca. The average course credit toward York was just under one year for Seneca graduates, whereas non-graduates averaged just over one semester. Among all Seneca business students who transferred to York, 18% obtained no credit at York for their previous Seneca studies.

Table 10. Amount of total transfer credit provided to Seneca business students transferring to York, by credits earned at Seneca and graduation status prior to transfer

| # Credits Earned at Seneca | Total      | Graduate (Seneca) |                               | Non-Graduate (Seneca) |                               | Missing & Zero Credit |
|----------------------------|------------|-------------------|-------------------------------|-----------------------|-------------------------------|-----------------------|
|                            | n          | n                 | Average Total Transfer Credit | n                     | Average Total Transfer Credit | n                     |
| <10                        | 73         | 4                 | -                             | 69                    | 11.4                          | 38                    |
| 10-19                      | 129        | 56                | 19.9                          | 73                    | 14.4                          | 36                    |
| 20-29                      | 350        | 312               | 25.4                          | 38                    | 24.4                          | 39                    |
| 30+                        | 149        | 143               | 34.7                          | 6                     | 36.0                          | 16                    |
| <b>Total</b>               | <b>701</b> | <b>515</b>        | <b>27.4</b>                   | <b>186</b>            | <b>16.0</b>                   | <b>129</b>            |

Notes: (1) Transfer credit not specific to Seneca courses. (2) Average credit includes zero and missing credit (as zero credit). (3) "-" indicates a cell size <5. (4) At Seneca, 10 credits = 2 semesters; at York, 30 credits = 2 semesters.

The vast majority of students transferred to Ryerson after graduating from a three-year diploma at Seneca, and thus obtained almost two years of credit toward their Ryerson degree. Less than 10% of transfer students from Seneca received no transfer credit at Ryerson for their previous Seneca studies.

Table 11. Amount of total credit provided to Seneca business students transferring to Ryerson, by credits earned at Seneca and graduation status prior to transfer

| # Credits Earned at Seneca | Total Sample | Graduate (Seneca) |                               | Non-Graduate (Seneca) |                               | Missing & Zero Credit |
|----------------------------|--------------|-------------------|-------------------------------|-----------------------|-------------------------------|-----------------------|
|                            | n            | n                 | Average Total Transfer Credit | n                     | Average Total Transfer Credit | n                     |
| <10                        | 22           | 2                 | -                             | 20                    | 2.0                           | 17                    |
| 10-19                      | 24           | 5                 | 16.8                          | 19                    | 3.3                           | 8                     |
| 20-29                      | 80           | 68                | 16.0                          | 12                    | 10.6                          | 10                    |
| 30+                        | 269          | 264               | 19.9                          | 5                     | 20.4                          | 2                     |
| <b>Total</b>               | <b>395</b>   | <b>339</b>        | <b>19.1</b>                   | <b>56</b>             | <b>5.9</b>                    | <b>37</b>             |

Notes: (1) Transfer credit not specific to Seneca courses. (2) Average credit includes zero and missing credit (as zero credit). (3) "-" indicates a cell size <5. (4) See the methods section for description of how Ryerson's direct entry and degree completion pathways were converted to Ryerson credit. (5) At Seneca, 10 credits = 2 semesters; at Ryerson, 22 credits = approximately 4 semesters. (5) We were unable to distinguish between the transfer student who submitted a transcript and received no credit, and the transfer student who did not submit a transcript for transfer credit.

## PROGRAMS AND CREDENTIALS BY PATHWAY

Table 12 presents the highest credential a student was enrolled in at York or Ryerson by transfer pathway, either prior to their first transfer event or following their return to the initial sending institution. Overall, results for York and Ryerson students are similar. The highest degree program enrolled in at university was a bachelor's for 99% of students who transferred from either York or Ryerson. For Seneca students who transferred to York or Ryerson, the bachelor degree program was the highest credential they enrolled in (98% and 99%, respectively).

Table 12. Highest credential enrolled in at York and Ryerson by pathway, pre- and post-transfer from Seneca

|                   | York to Seneca | Seneca to York | Ryerson to Seneca | Seneca to Ryerson |
|-------------------|----------------|----------------|-------------------|-------------------|
| Bachelor's Degree | 1,225          | 688            | 388               | 391               |
| Master's Degree   | 7              | 12             | 1                 | 3                 |
| PhD               | 1              | 1              | 1                 | 0                 |
| <b>Total</b>      | <b>1,233</b>   | <b>701</b>     | <b>392</b>        | <b>395</b>        |

Note: (1) For the Ryerson-to-Seneca pathway, 2 students in the data file were each identified as a "special student." (2) For the Seneca-to-Ryerson pathway, 1 student in the data file was identified as being in a certificate program. (3) Data not shown for these 3 students, but included in column totals.

Table 13 shows the type of credential enrolled in at Seneca by pathway and graduation status. For the university-to-Seneca pathway, an overwhelming share of those who graduated from university entered graduate certificate programs, which usually require a credential for entry. Those who had not graduated from university predominately entered two- or three-year diploma programs, with York students more likely to enter two-year diplomas (43%) and Ryerson students more likely to enter three-year diplomas (40%). Interestingly, a substantial share of students entered a bachelor's degree program at Seneca, particularly students transferring to Seneca from Ryerson (30%).

For the Seneca-to-university pathway, non-graduates were somewhat more likely to come from a Seneca degree program. Seneca graduates who went on to Ryerson were mainly from three-year diploma programs (81%), whereas graduates going on to York were split between the two- and three-year diploma programs.

Table 13. Seneca business credential of entry by transfer pathway and graduation status prior to transfer

|                             |                        | Total Sample | 1-Year Certificate | 2-Year Diploma | 3-Year Diploma | Bachelor's Degree | Graduate Certificate |
|-----------------------------|------------------------|--------------|--------------------|----------------|----------------|-------------------|----------------------|
|                             | Full Population        | 24,610       | 0.9%               | 42.7%          | 31.6%          | 7.1%              | 17.8%                |
| <b>York to Seneca</b>       | Non-Grads (York)       | 806          | 0.5%               | 42.7%          | 32.5%          | 14.1%             | 10.2%                |
|                             | Grads (York)           | 427          | 0.0%               | 8.0%           | 4.4%           | 0.5%              | 87.1%                |
| <b>Ryerson to Seneca</b>    | Non-Grads (Ryerson)    | 306          | 0.3%               | 28.8%          | 40.2%          | 27.5%             | 3.3%                 |
|                             | Grads (Ryerson)        | 86           | 0.0%               | 9.3%           | 0.0%           | 2.3%              | 88.4%                |
| <b>Seneca to York</b>       | Non-Grads (Seneca)     | 186          | 0.5%               | 34.4%          | 51.1%          | 13.4%             | 0.5%                 |
|                             | Grads (Seneca)         | 515          | 0.8%               | 49.7%          | 46.0%          | 1.4%              | 2.1%                 |
| <b>Seneca to Ryerson</b>    | Non-Grads (Seneca)     | 56           | 1.8%               | 19.6%          | 53.6%          | 23.2%             | 1.8%                 |
|                             | Grads (Seneca)         | 339          | 0.3%               | 17.4%          | 81.1%          | 0.9%              | 0.3%                 |
| <b>University to Seneca</b> | Non-Grads (University) | 1,104        | 0.5%               | 39.0%          | 34.6%          | 17.8%             | 8.1%                 |
|                             | Grads (University)     | 513          | 0.0%               | 8.2%           | 3.7%           | 0.8%              | 87.3%                |
| <b>Seneca to University</b> | Non-Grads (Seneca)     | 242          | 0.8%               | 31.0%          | 51.7%          | 15.7%             | 0.8%                 |
|                             | Grads (Seneca)         | 846          | 0.6%               | 37.0%          | 59.9%          | 1.1%              | 1.4%                 |

Students moving from Seneca business programs to York mostly entered programs related to business and economics (82%), with the remainder mostly entering arts programs (Table 14). Students moving in the other direction came from a variety of programs at York, with only 26% from business and related programs, and a large share from arts programs (56%). Most of the Seneca students who transferred to Ryerson entered a business or related program (95%). Among students originating at Ryerson, 56% came from business or related programs and 20% from science and engineering (Table 15).

Many of these institutional differences likely reflect the distribution of program offerings, with York's programs more based on the arts and humanities compared to Ryerson's.<sup>10</sup>

Table 14. York program of entry by transfer pathway

| First Program Enrolled in at York                   | Total Sample | %             | York Before Seneca | %             | York After Seneca | %             |
|---|--------------|---------------|--------------------|---------------|-------------------|---------------|
| <b>Bachelor of Commerce</b>                         | 390          | 20.1%         | 77                 | 6.2%          | 313               | 44.7%         |
| <b>Schulich Bachelor of Business Administration</b> | 7            | 0.4%          | 6                  | 0.5%          | 1                 | 0.1%          |
| <b>Bachelor of Arts</b>                             |              |               |                    |               |                   |               |
| Business and Society                                | 150          | 7.7%          | 64                 | 5.2%          | 85                | 12.1%         |
| Economics   | 100          | 5.2%          | 37                 | 3.0%          | 62                | 8.8%          |
| Business Economics                                  | 87           | 4.5%          | 41                 | 3.3%          | 46                | 6.6%          |
| Financial and Business Economics                    | 75           | 3.9%          | 38                 | 3.1%          | 37                | 5.3%          |
| Mathematics for Commerce                            | 15           | 0.8%          | 12                 | 1.0%          | 3                 | 0.4%          |
| <b>Bachelor of Human Resources Management</b>       | 68           | 3.5%          | 48                 | 3.9%          | 20                | 2.9%          |
| <b>Master of Accounting</b>                         | 1            | 0.1%          | 0                  | 0.0%          | 1                 | 0.1%          |
| <b>Master of Business Administration</b>            | 2            | 0.1%          | 0                  | 0.0%          | 2                 | 0.3%          |
| <b>Master of Finance</b>                            | 1            | 0.1%          | 1                  | 0.1%          | 0                 | 0.0%          |
| <b>Master of Financial Accountability</b>           | 3            | 0.2%          | 0                  | 0.0%          | 3                 | 0.4%          |
| <b>Master of Human Resources Management</b>         | 1            | 0.1%          | 0                  | 0.0%          | 1                 | 0.1%          |
| <b>Business Related Sub-Total</b>                   | <b>900</b>   | <b>46.4%</b>  | <b>324</b>         | <b>26.3%</b>  | <b>574</b>        | <b>81.9%</b>  |
| <b>Bachelor of Arts (Other) §</b>                   | 781          | 40.2%         | 685                | 55.6%         | 92                | 13.1%         |
| <b>Bachelor of Science ¥</b>                        | 140          | 7.2%          | 128                | 10.4%         | 12                | 1.7%          |
| <b>Other</b>  | 120          | 6.2%          | 96                 | 7.8%          | 23                | 3.3%          |
| <b>Total</b>  | <b>1,941</b> | <b>100.0%</b> | <b>1,233</b>       | <b>100.0%</b> | <b>701</b>        | <b>100.0%</b> |

Notes: (1) § Bachelor of Arts (Other) excludes Arts programs listed above. (2) ¥ Bachelor of Science also includes Collaborative Nursing and Applied Science.

<sup>10</sup> In 2016, 16% of York's full-time undergraduate enrollment was in Business & Commerce, versus 29% at Ryerson. Almost half (47%) of York's enrollment was in the Social Sciences and Humanities compared with 25% at Ryerson. See: Common Usage Data Ontario website at <https://cudo.ouac.on.ca/>

Table 15. Ryerson program of entry by transfer pathway

| First Program Enrolled in at Ryerson                              |   | Total Sample | %             | Ryerson Before Seneca | %             | Ryerson After Seneca | %             |
|---|---|--------------|---------------|-----------------------|---------------|----------------------|---------------|
| <b>Bachelor of Commerce</b>                                       | Business Management                                     | 378          | 47.9%         | 97                    | 24.7%         | 281                  | 71.1%         |
|   | Business Technology Management (Information Technology) | 96           | 12.2%         | 53                    | 13.5%         | 43                   | 10.9%         |
|   | Hospitality and Tourism Management                      | 48           | 6.1%          | 28                    | 7.1%          | 20                   | 5.1%          |
|   | Retail Management                                       | 25           | 3.2%          | 15                    | 3.8%          | 10                   | 2.5%          |
|   | Accounting and Finance                                  | 11           | 1.4%          | 4                     | 1.0%          | 7                    | 1.8%          |
| <b>Bachelor of Arts</b>   | International Economics and Finance                     | 27           | 3.4%          | 24                    | 6.1%          | 3                    | 0.8%          |
|   | Public Administration and Governance                    | 2            | 0.3%          | 1                     | 0.3%          | 1                    | 0.3%          |
| <b>Bachelor of Design</b>   | Fashion Communication                                   | 5            | 0.6%          | 0                     | 0.0%          | 5                    | 1.3%          |
|   | Fashion Design  | 2            | 0.3%          | 1                     | 0.3%          | 1                    | 0.3%          |
| <b>Professional Master's Diploma - Accounting</b>                 |   | 1            | 0.1%          | 0                     | 0.0%          | 1                    | 0.3%          |
| <b>Public Administration and Governance Certificate - Level 1</b> |   | 1            | 0.1%          | 0                     | 0.0%          | 1                    | 0.3%          |
| <b>Master of Arts</b>   | International Economics and Finance                     | 1            | 0.1%          | 0                     | 0.0%          | 1                    | 0.3%          |
| <b>Sub-total Business Related</b>                                 |   | <b>597</b>   | <b>75.7%</b>  | <b>223</b>            | <b>56.9%</b>  | <b>374</b>           | <b>94.7%</b>  |
| <b>Bachelor of Arts (Other) §</b>                                 |   | 59           | 7.5%          | 54                    | 13.8%         | 5                    | 1.3%          |
| <b>Bachelor of Science and Related ¥</b>                          |   | 52           | 6.6%          | 44                    | 11.2%         | 8                    | 2.0%          |
| <b>Bachelor of Engineering</b>                                    |   | 40           | 5.1%          | 36                    | 9.2%          | 2                    | 0.5%          |
| <b>Other</b>  |   | 41           | 5%            | 35                    | 8.9%          | 6                    | 1.5%          |
| <b>Total</b>  |   | <b>789</b>   | <b>100.0%</b> | <b>392</b>            | <b>100.0%</b> | <b>395</b>           | <b>100.0%</b> |

Notes: (1) § Bachelor of Arts (Other) excludes Arts programs listed above. (2) ¥ Bachelor of Science also includes Collaborative Nursing and Architecture.

At Seneca, 62% of business students were mainly enrolled in two program areas: (1) accounting and financial services, and (2) international business and management (Table 16). These two program areas were also predominant among students entering Seneca from York or Ryerson. However, program areas involving human resources and public administration & government relations had a much larger share of students entering from York and Ryerson than in the general Seneca population, likely because these program areas offer graduate certificates. Students who transferred from Seneca business to York were most likely to transfer from accounting areas (47%), followed by international business and management areas. Seneca students entering Ryerson were most likely to originate from international business and management program areas, with a much higher share from the human resources and leadership program area transferring to Ryerson (10%) than to York (3.6%). For all pathways, hospitality and tourism programs comprised a lower share of transfer students compared to the non-transfer Seneca population.

Table 16. Seneca program area of entry by transfer pathway

| First Program Enrolled in at Seneca                   | Non-Transfers (Seneca Only) | York Before Seneca | Ryerson Before Seneca | Seneca Before York | Seneca Before Ryerson | Total Seneca Population |
|---|-----------------------------|--------------------|-----------------------|--------------------|-----------------------|-------------------------|
| <b>Total Sample (n)</b>                               | 21,922                      | 1,233              | 392                   | 701                | 395                   | 24,610                  |
| <b>Accounting and Financial Services</b>              | 31.1%                       | 23.0%              | 28.3%                 | 46.9%              | 28.1%                 | 31.1%                   |
| <b>International Business &amp; Management</b>        | 31.7%                       | 20.1%              | 29.8%                 | 35.4%              | 41.3%                 | 31.3%                   |
| <b>Hospitality and Tourism</b>                        | 12.5%                       | 6.7%               | 6.6%                  | 2.3%               | 5.3%                  | 11.8%                   |
| <b>Marketing</b>                                      | 10.0%                       | 13.5%              | 11.5%                 | 10.4%              | 11.4%                 | 10.2%                   |
| <b>Human Resources and Leadership</b>                 | 7.7%                        | 20.9%              | 15.1%                 | 3.6%               | 9.9%                  | 8.4%                    |
| <b>Arts, Technology, Science Management</b>           | 4.3%                        | 2.8%               | 3.6%                  | 1.1%               | 3.8%                  | 4.1%                    |
| <b>Public Administration and Government Relations</b> | 2.7%                        | 13.0%              | 5.1%                  | 0.3%               | 0.3%                  | 3.2%                    |

Note: If a student had previous Seneca enrollment data prior to their university-to-Seneca transfer date, the first program of enrollment at Seneca was identified as the first program enrolled in following their transfer date.

## ACADEMIC OUTCOMES AFTER TRANSFER

Figure 10 presents the distribution of students' average grades at their receiving institution by graduation status and transfer pathway. Overall, combining graduates and non-graduates, 4% of students who transferred from college to university obtained a grade average of A at their receiving institution; 39% received a B, 43% a C, and 14% a D or below. Among students who transferred from university to college, 25% obtained a grade average of A at Seneca, 31% a B, 22% a C, and 22% a D or below (data not shown). Students who graduated before transferring performed better after transfer, with the effect far more pronounced for the university-to-Seneca pathways. As shown previously in Figure 6, York and Ryerson students who came to Seneca without a degree had very poor grades, with over two thirds obtaining a D or below prior to transfer. Although on average they obtained higher grades at Seneca than in university, only 43% from York and 35% from Ryerson obtained a B or above at Seneca. Those entering Seneca with a completed degree had strong grades, with 87% from York and 89% from Ryerson obtaining an average of B or above.

Among students who transferred to university, the distribution of grades at the receiving institution differed by graduation status prior to transfer and by the university to which they transferred, with those who transferred to Ryerson obtaining better grades.

Figure 10. Grades at the receiving institution after transfer by pathway and graduation status

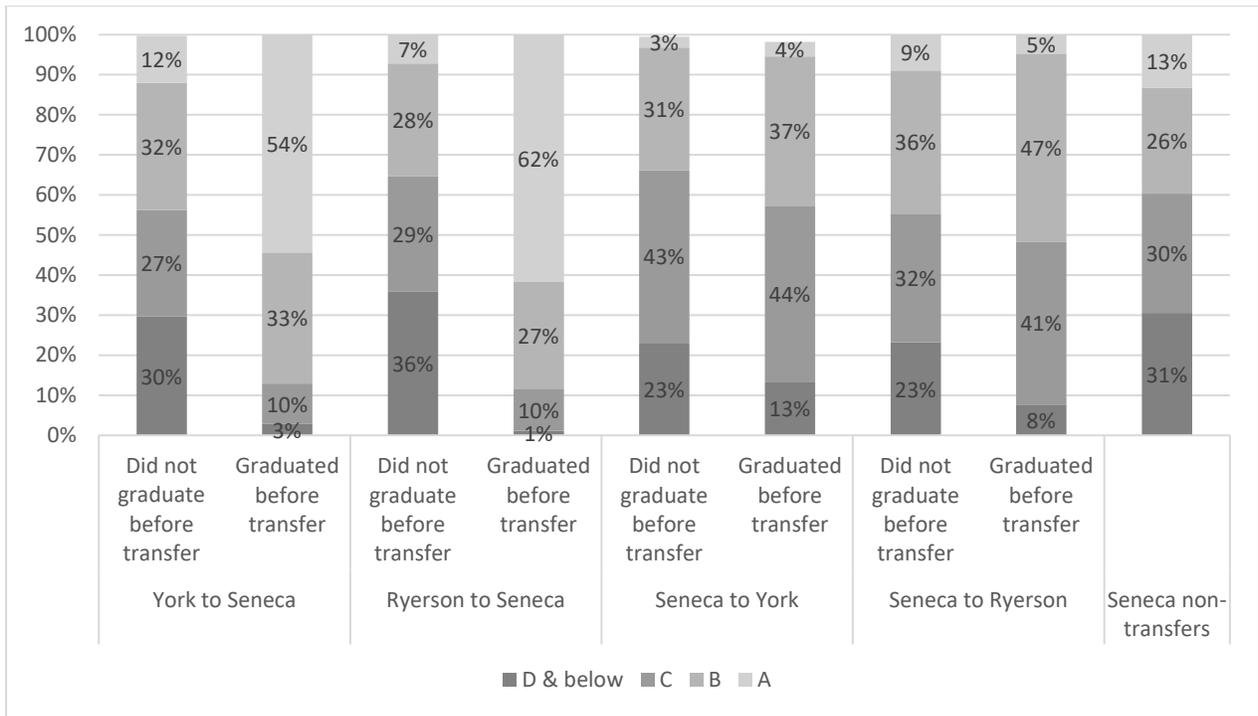


Table 17 and Table 18, respectively, present enrollment status after one and two years of study following transfer, by transfer pathway and graduation status. After one year, the overwhelming share of university graduates who had entered Seneca have graduated, likely due to the prevalence of one-year graduate certificate programs at Seneca. The withdrawal rates were slightly higher for university non-graduates compared to the rest of the pathways and were somewhat similar to those of the Seneca non-transfer population. However, first-year retention was strong for all investigated pathways.

Table 17. Enrollment status one year after transfer by pathway and graduation status at the sending institution

|                              |                     | n             | Withdrawn    | Still Enrolled | Graduated    |
|------------------------------|---------------------|---------------|--------------|----------------|--------------|
| <b>York to Seneca</b>        | Non-Grads (York)    | 803           | 20.4%        | 66.7%          | 12.8%        |
|                              | Grads (York)        | 423           | 14.2%        | 10.2%          | 75.7%        |
| <b>Ryerson to Seneca</b>     | Non-Grads (Ryerson) | 306           | 18.6%        | 74.2%          | 7.2%         |
|                              | Grads (Ryerson)     | 86            | 16.3%        | 11.6%          | 72.1%        |
| <b>University to Seneca*</b> |                     | <b>1,610</b>  | <b>18.3%</b> | <b>50.3%</b>   | <b>31.4%</b> |
| <b>Seneca to York</b>        | Non-Grads (Seneca)  | 159           | 13.2%        | 83.0%          | 3.8%         |
|                              | Grads (Seneca)      | 411           | 15.1%        | 79.1%          | 5.8%         |
| <b>Seneca to Ryerson</b>     | Non-Grads (Seneca)  | 45            | 15.6%        | 82.2%          | 2.2%         |
|                              | Grads (Seneca)      | 282           | 15.2%        | 84.8%          | 0.0%         |
| <b>Seneca to University*</b> |                     | <b>891</b>    | <b>14.6%</b> | <b>81.9%</b>   | <b>3.5%</b>  |
| <b>Seneca Non-transfers</b>  |                     | <b>21,504</b> | <b>18.9%</b> | <b>60.2%</b>   | <b>21.0%</b> |

Notes: (1) Students who transferred, or whose first program began after the 2017 winter term, were excluded. (2) \*In cases where more than one transfer event was identified per student, only the first transition event was counted.

At the two-year mark, Seneca students who entered York (both graduates and non-graduates) had the highest withdrawal rates of all pathways, with almost one third of students leaving (Table 18). The next highest rate of withdrawal by the two-year mark was for students from York and Ryerson who left Seneca without graduating (28% and 27%, respectively). University graduates who continued to Seneca had the highest share of graduates, reflective of their high enrollment in Seneca's shorter duration graduate certificate programs, followed by Seneca graduates who went on to Ryerson, 40% of whom completed a degree within two years of transfer.

Table 18. Enrollment status two years after transfer by pathway and graduation status at the sending institution

|                              |                     | n             | Withdrew     | Still Enrolled | Graduated    |
|------------------------------|---------------------|---------------|--------------|----------------|--------------|
| <b>York to Seneca</b>        | Non-Grads (York)    | 670           | 27.8%        | 35.2%          | 37.0%        |
|                              | Grads (York)        | 358           | 10.6%        | 2.2%           | 87.2%        |
| <b>Ryerson to Seneca</b>     | Non-Grads (Ryerson) | 267           | 27.3%        | 51.3%          | 21.3%        |
|                              | Grads (Ryerson)     | 65            | 16.9%        | 1.5%           | 81.5%        |
| <b>University to Seneca*</b> |                     | <b>1,355</b>  | <b>22.7%</b> | <b>28.0%</b>   | <b>49.3%</b> |
| <b>Seneca to York</b>        | Non-Grads (Seneca)  | 115           | 33.0%        | 53.0%          | 13.9%        |
|                              | Grads (Seneca)      | 289           | 31.5%        | 45.3%          | 23.2%        |
| <b>Seneca to Ryerson</b>     | Non-Grads (Seneca)  | 31            | 9.7%         | 83.9%          | 6.5%         |
|                              | Grads (Seneca)      | 224           | 17.4%        | 42.4%          | 40.2%        |
| <b>Seneca to University*</b> |                     | <b>654</b>    | <b>25.8%</b> | <b>47.4%</b>   | <b>26.8%</b> |
| <b>Seneca non-transfers</b>  |                     | <b>18,165</b> | <b>26.8%</b> | <b>32.6%</b>   | <b>40.6%</b> |

Notes: (1) Students who transferred, or whose first program began after the 2016 winter term, were excluded. (2) \*In cases where more than one transfer event was identified per student, only the first transition event was counted.

The results show the strong association between grades before transfer and both graduation rates and grades post-transfer for all transfer pathways. For example, Seneca students who continued on to York or Ryerson with an average of D or below (GPA <2.0) continued to obtain about a D average in university and had extremely low two- and three-year graduation rates (Figure 11, Figure 12). Although Seneca's B-average students went on to obtain higher university grades than C average students at Seneca, the graduation rates were similar between the two grade levels, particularly at York.

University students who entered a Seneca business program with a university average of D or below were much less likely to complete their Seneca program on time and more likely to receive poor grades at Seneca (Figure 13, Figure 14). University students entering Seneca with a university average of C or above tended to obtain an average of B or above at Seneca. Students from York achieved similar academic outcomes at Seneca regardless of whether they had an average of B or C at York: most students were observed to have strong retention and grades of B or above at Seneca. However, for Ryerson students at Seneca, more variation in academic performance was observed between those entering with a university average of B versus C.

Figure 11. Academic outcomes at Ryerson after transfer from Seneca, by Seneca GPA

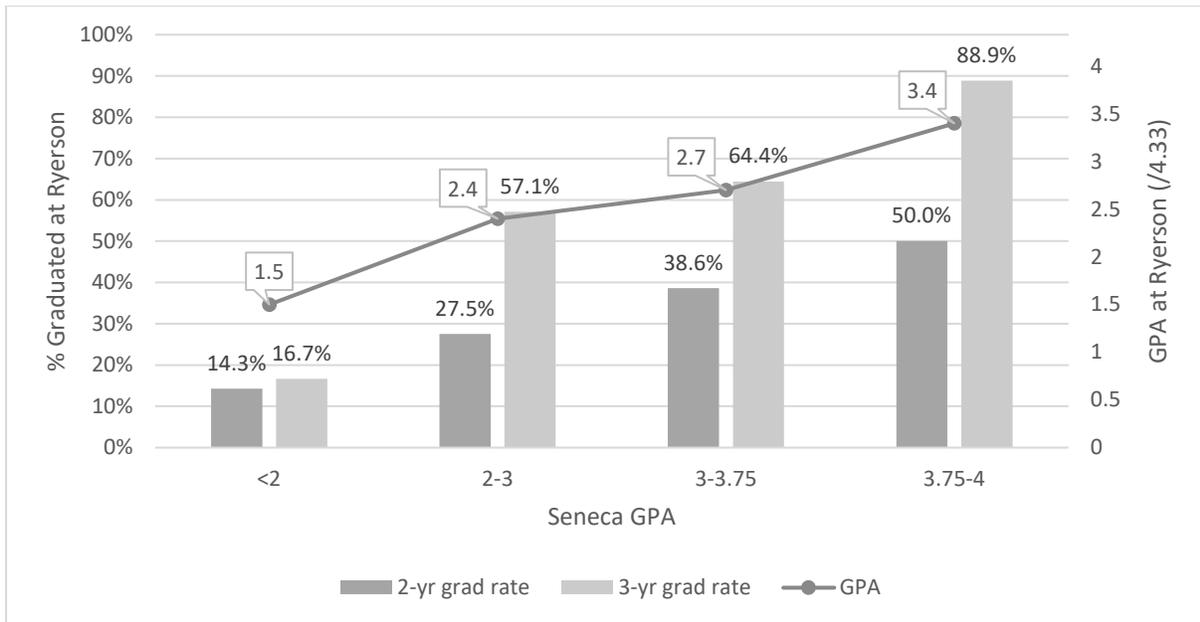


Figure 12. Academic outcomes at York after transfer from Seneca, by Seneca GPA

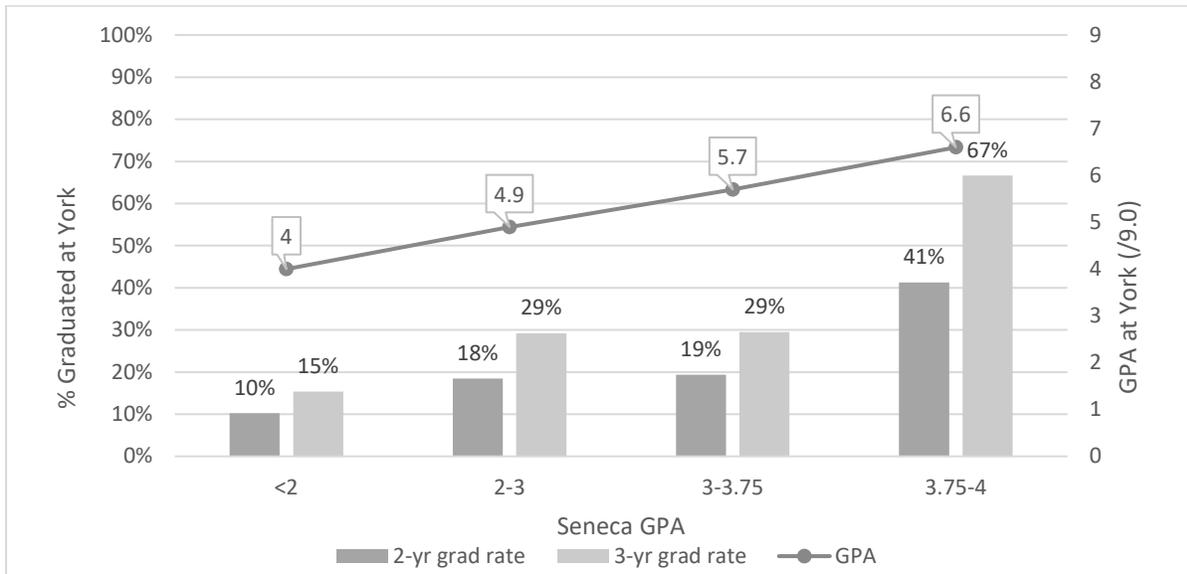


Figure 13. Academic outcomes at Seneca after transfer from York, by York GPA

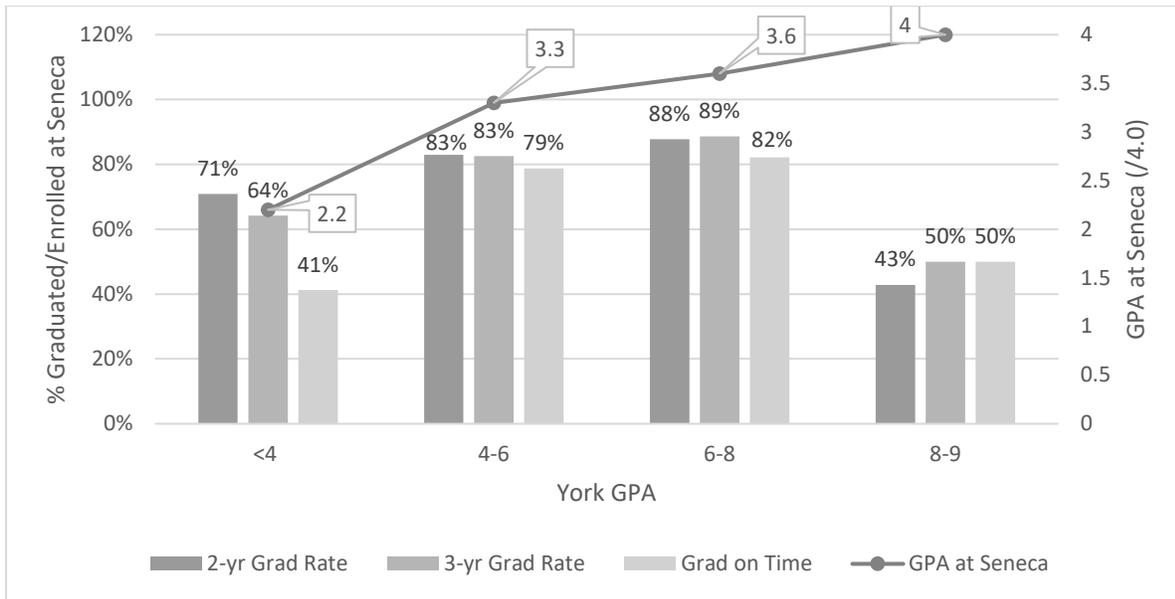


Figure 14. Academic outcomes at Seneca after transfer from Ryerson, by Ryerson GPA

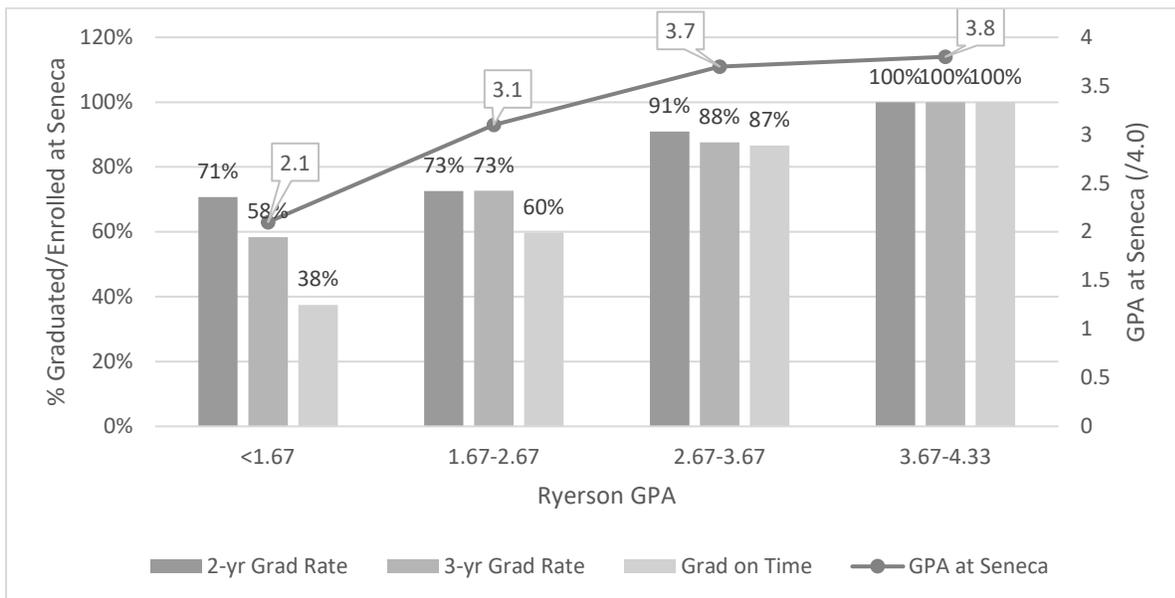


Table 19 presents the average GPAs, retention and graduation outcomes achieved at university by the amount of transfer credit or advanced standing awarded to Seneca transfer students. A positive trend was observed for higher GPAs among Seneca transfer students who received higher advanced standing upon university entry, with a stronger gradient at York. First-year retention differed little by the amount of advanced standing, except for those who entered university with no record of transfer credit, who had lower first-year retention. At Ryerson, however, Seneca transfer students who received more advanced standing upon university entry had a higher graduation rate within three years of transferring. Results for York are complicated by the conferring of both three- and four-year degrees.

However, at both York and Ryerson, the transfer population with more than three semesters of transfer credit had a higher share of graduates within three years.

Table 19. Academic outcomes at university for Seneca transfer students by estimated transfer credit received

|                | Transfer Credit       | n   | Mean GPA | First Year Retention | Grad in 3 Years |
|----------------|-----------------------|-----|----------|----------------------|-----------------|
| <b>York</b>    | 0 & Missing           | 129 | 4.8/9.0  | 76.3%                | 23.5%           |
|                | <15 (<1 semester)     | 104 | 5.2/9.0  | 88.3%                | 29.0%           |
|                | 15-29 (1-2 semesters) | 327 | 5.5/9.0  | 88.9%                | 35.6%           |
|                | 30-44 (2-3 semesters) | 112 | 5.4/9.0  | 83.9%                | 26.2%           |
|                | 45+ (>3 semesters)    | 29  | 6.2/9.0  | 85.7%                | 60.0%           |
| <b>Ryerson</b> | 0 & Missing           | 37  | 2.2/4.33 | 67.7%                | 14.3%           |
|                | <6 (<1 semester)      | 18  | 2.6/4.33 | 86.7%                | 14.3%           |
|                | 6-10 (1-2 semesters)  | 14  | 2.6/4.33 | 60.0%                | --              |
|                | 11-16 (2-3 semesters) | 55  | 2.5/4.33 | 91.1%                | 50.0%           |
|                | 17+ (>3 semesters)    | 271 | 2.7/4.33 | 86.7%                | 76.2%           |

Notes: (1) Transfer credit includes all credit granted at the receiving institution for any previous academic history at another institution (not specific to Seneca). (2) For the one-year retention calculation, students who entered university after the 2017 winter term were excluded (n = 131 for York, n = 68 for Ryerson); those graduated by the one-year mark were included as retained. (3) For the three-year graduation rate calculation, students who entered university after the 2015 winter term were excluded (n = 435 for York, n = 216 for Ryerson). (4) "--" indicates a cell size of <5. (5) York also confers three-year ordinary degrees and four-year honours degrees.

## PATHWAY ANALYSIS

### SENECA TO RYERSON

As described, the predominant business pathway for college students at Ryerson is the direct entry pathway, which enables graduates of three-year business diplomas to enter the third year of a Ryerson business management major, with a requirement of up to six reach-back courses dependent on the student's academic history. Additionally, Ryerson offers a two-year degree completion program in business technology management for CAAT graduates of three-year business diplomas.

Table 20 presents in detail the numbers of students moving through these pathways. In total, 292 students in Seneca's three-year business administration program graduated between 2012–13 and 2016–17 and enrolled in one of Ryerson's business management programs or in its business technology management program. Prior to transfer to Ryerson, the most common business program from which Seneca students graduated was the management diploma program (n = 80), followed by the human resources diploma program (n = 48). The most common Ryerson degree program entered by Seneca transfer students was marketing, with 67 Seneca graduates entering, followed by the now discontinued majors of accounting and finance (n = 56). Seneca's graduates were often also transferring within majors, with 37 moving within human resources, 33 within marketing, and 30 within accounting and finance.

Table 20. Number of Seneca transfers by program for Ryerson's direct entry and degree completion pathways, graduates of three-year business administration diplomas

| Ryerson Business Management Major                      |                      |                  |            |               |             |           |             |                 |              |            |
|--|----------------------|------------------|------------|---------------|-------------|-----------|-------------|-----------------|--------------|------------|
| Seneca Business Advanced Diploma Program of Graduation | Econ. & Mgt. Science | Entrepreneurship | Global Mgt | Hum. Res. Mgt | Law & Busin | Marketing | Real Estate | *Acct & Finance | Bus Tech Mgt | Total      |
| Accounting & Finance                                   | 1                    |                  |            |               |             |           |             | 30              | 4            | 35         |
| Entrepreneurship and Small Business                    | 1                    | 3                | 1          |               |             | 2         | 1           |                 | 4            | 12         |
| Financial Planning                                     | 5                    |                  | 2          | 1             | 1           | 3         |             | 7               | 1            | 20         |
| Human Resources  | 1                    |                  |            | 37            | 2           | 3         |             | 1               | 4            | 48         |
| International Business                                 | 4                    | 1                | 12         | 1             | 3           | 7         |             | 5               | 3            | 36         |
| Management   | 7                    | 2                | 13         | 6             | 7           | 18        | 1           | 9               | 17           | 80         |
| Marketing  |                      |                  | 1          |               | 1           | 33        | 2           |                 | 4            | 41         |
| Purchasing and Supply Management                       |                      |                  | 8          |               |             | 1         |             | 1               | 2            | 12         |
| Other Direct Entry                                     | 2                    |                  | 2          | 1             |             |           |             | 3               |              | 8          |
| <b>Total</b>   | <b>21</b>            | <b>6</b>         | <b>39</b>  | <b>46</b>     | <b>14</b>   | <b>67</b> | <b>4</b>    | <b>56</b>       | <b>39</b>    | <b>292</b> |

Notes: (1) \*Accounting and finance majors were discontinued in 2015. (2) Business Technology Management is a degree completion program. (3) Seneca programs listed are all three-year diplomas in business administration. (4) Other direct-entry pathways include those who did not complete a Seneca three-year business diploma, but were admitted as a direct entrant.

Table 21 shows the academic performance of Seneca students who took the direct entry or degree completion pathways offered by Ryerson. The average Seneca grades pre-transfer were similar across Ryerson majors of entry (from 3.1 to 3.3 /4.0, about 75%). However, post-transfer, Ryerson grades varied by programs, with graduates who entered Entrepreneurship or Global Management obtained the highest averages (2.9 /4.33), and those who entered Economics and Management Science obtaining the lowest GPA (2.3,C+). Average credits taken per year indicates that transfer students were not taking the full course load, which is generally 10 credits per year in upper years. Students appeared to be taking somewhat less than an 80% course load, with economics students taking the lightest course load.

Table 21. Sending and receiving GPA of Seneca transfers in Ryerson's business direct-entry and degree completion pathways, graduates of Seneca's three-year business diplomas

| Ryerson Business Major         | n          | GPA Seneca (/4.0) | GPA Ryerson (/4.33) | % Failed Courses at Ryerson | # Credits Taken Per Year |
|--------------------------------|------------|-------------------|---------------------|-----------------------------|--------------------------|
| Economics & Management Science | 21         | 3.2               | 2.3                 | 8.7%                        | 6.3                      |
| Entrepreneurship               | 6          | 3.3               | 2.9                 | 11.9%                       | 7.8                      |
| Global Management              | 39         | 3.3               | 2.9                 | 3.2%                        | 8                        |
| Human Resources Management     | 46         | 3.2               | 2.5                 | 5.1%                        | 8.1                      |
| Law and Business               | 14         | 3.1               | 2.6                 | 8.2%                        | 7.4                      |
| Marketing Management           | 67         | 3.3               | 2.7                 | 6.3%                        | 8.1                      |
| Real Estate Management         | 4          | -                 | -                   | -                           | -                        |
| Accounting & Finance           | 56         | 3.1               | 2.7                 | 7.9%                        | 7.4                      |
| Business Technology*           | 39         | 3.1               | 2.8                 | 7.6%                        | 8.2                      |
| <b>Total</b>                   | <b>292</b> | <b>3.2</b>        | <b>2.7</b>          | <b>6.5%</b>                 | <b>7.8</b>               |

Notes: (1) Includes all Seneca graduates of a three-year business diploma program who transferred to Ryerson's business direct-entry or degree completion pathways between fall 2013 and winter 2017. (2) Direct entry accounting and finance majors were discontinued in 2015 and are combined in the above table. (3) "-" indicates cell size <5.

In terms of retention and graduation rates, among Seneca students who transferred to Ryerson through direct entry or degree completion pathways, graduates in the business technology degree completion program had the highest one-year retention rate (97%) and the highest three-year graduation rate (88%). In addition to having the lowest grades (Table 21), transfer students in economics and management science also had the lowest first-year retention rate (63%), with 11% graduating at the two-year mark. Overall, 43% of students graduated within two years despite taking, on average, a course load of less than 80%, with 73% graduating within three years.

Table 22. Graduation and retention rate of Seneca transfers in Ryerson's business direct-entry and degree completion pathways, graduates of Seneca's three-year business diplomas

| <b>Major</b>                              | <b>2013-2017<br/>Entering Cohorts<br/>(n)*</b> | <b>First Year<br/>Retention<br/>Rate (%)</b> | <b>2-Year<br/>Graduation<br/>Rate (%)</b> | <b>3-Year<br/>Graduation<br/>Rate (%)</b> |
|---|--|--|---|---|
| <b>Economics &amp; Management Science</b> | 21   | 62.5%  | 11.1%                                     | ---                                       |
| <b>Entrepreneurship</b>                   | 6  | ---  | ---                                       | ---                                       |
| <b>Global Management</b>                  | 39   | 94.1%  | 42.3%                                     | 69.2%                                     |
| <b>Human Resources Management</b>         | 46   | 82.9%  | 64.7%                                     | 80.0%                                     |
| <b>Law &amp; Business</b>                 | 14   | 81.8%  | 62.5%                                     | 66.7%                                     |
| <b>Marketing Management</b>               | 67   | 89.3%  | 38.6%                                     | 80.0%                                     |
| <b>Real Estate Management</b>             | 4  | ---  | ---                                       | ---                                       |
| <b>Accounting &amp; Finance</b>           | 56   | 85.7%  | 30.4%                                     | 62.5%                                     |
| <b>Business Technology*</b>               | 39   | 96.6%  | 60.9%                                     | 87.5%                                     |
| <b>Total</b>                              | <b>292</b>                                     | <b>86.9%</b>                                 | <b>42.9%</b>                              | <b>72.5%</b>                              |

Notes: (1) Includes all Seneca graduates of a three-year business diploma program who transferred to Ryerson's business direct-entry or \*degree completion pathways between fall 2013 and winter 2017. (2) "---" indicates cell size <5. (3) For the one-year retention calculation, students who entered Ryerson after the 2017 winter term were excluded (n = 41) and those who graduated by the one-year mark were included as retained. (3) For the two-year graduation rate calculation, students who entered Ryerson after the 2016 winter term were excluded (n = 89). (4) For the three-year graduation rate calculation, students who entered Ryerson after the 2015 winter term were excluded (n = 143).

## SENECA TO YORK

As described, York's block transfer policy categorizes college programs by level of academic rigour. Within the business programs, Seneca and York have in place two articulation agreements: a two-year accounting diploma and a three-year accounting and finance diploma. During the study period, over 400 students graduated from a Seneca business program and transferred to a York business or related program (Table 23). Among Seneca graduates entering business and related programs at York, 57% entered commerce programs. Seneca students who transferred to York were more likely to come from two-year diploma programs. Overall, the two accounting-related programs (with articulated agreements) had the highest volume of transfers, at over 40% of the total.

Table 23. Number of Seneca business graduates who transferred to York business and related programs, by program area

|                               |  | Commerce | Economics<br>& Related | Busin &<br>Society | Human<br>Resources | Total |
|-------------------------------|--|----------|------------------------|--------------------|--------------------|-------|
| <b>1-Year<br/>Certificate</b> | Accounting Techniques  | 0        | 1                      | 0                  | 0                  | 1     |
| <b>2-Year</b>                 | Accounting   | 81       | 28                     | 8                  | 1                  | 118   |
|                               | Business - International Business                              | 21       | 35                     | 13                 | 1                  | 70    |
| <b>Diploma</b>                | Business   | 25       | 12                     | 10                 | 0                  | 47    |
|                               | Business - Marketing   | 15       | 1                      | 2                  | 3                  | 21    |
|                               | Financial Services - Client Services                           | 3        | 1                      | 0                  | 0                  | 4     |
|                               | Accounting and Payroll   | 2        | 1                      | 0                  | 0                  | 3     |
|                               | Business - Insurance   | 0        | 1                      | 0                  | 0                  | 1     |
|                               | International Transportation &<br>Customs                      | 2        | 4                      | 2                  | 1                  | 9     |
|                               | Hospitality Management – Hotel &<br>Restaurant                 | 1        | 0                      | 0                  | 0                  | 1     |
|                               | Fashion Business   | 0        | 0                      | 1                  | 1                  | 2     |
| <b>3-Year</b>                 | Accounting & Finance   | 42       | 5                      | 3                  | 0                  | 50    |
|                               | Business Administration - Financial<br>Planning                | 14       | 3                      | 3                  | 0                  | 20    |
| <b>Diploma</b>                | Business Administration -<br>Management                        | 11       | 2                      | 7                  | 0                  | 20    |
|                               | Business Administration -<br>International Business            | 6        | 7                      | 3                  | 0                  | 16    |
|                               | Business Administration - Human<br>Resources                   | 1        | 1                      | 1                  | 7                  | 10    |
|                               | Business Administration - Marketing                            | 6        | 0                      | 4                  | 0                  | 10    |
|                               | Business Administration -<br>Entrepreneurship & Small Business | 4        | 1                      | 1                  | 0                  | 6     |
|                               | Business Administration –<br>Purchasing & Supply Management    | 2        | 0                      | 1                  | 0                  | 3     |
|                               | Business Administration –<br>Accounting & Financial Planning   | 1        | 1                      | 0                  | 0                  | 2     |
| <b>4-Year<br/>Degree</b>      | Bachelor of Commerce – Business<br>Management                  | 0        | 1                      | 0                  | 1                  | 2     |
|                               | Bachelor of Commerce –<br>International Business Management    | 1        | 0                      | 0                  | 0                  | 1     |
| <b>Grad Cert</b>              | Financial Services Compliance<br>Administration                | 1        | 0                      | 0                  | 0                  | 1     |
| <b>Total</b>                  |  | 239      | 105                    | 59                 | 15                 | 418   |

Table 24 and Table 25 present the academic performance of Seneca business graduates both at Seneca and after transfer, at York. Transfer students entering commerce at York had the highest Seneca GPAs (3.3 /4.0) and the highest GPAs at York compared to other York program areas. Retention and graduation rates, however, were similar across all York program areas, with 25% of Seneca transfer students graduating within two years and 38% within three years. On average, students were taking fewer than 20 credits, less than two thirds of a full course load of 30 credits.

Table 24. Sending and receiving GPA of Seneca transfers to York's business and related programs, graduates of Seneca's business programs

|                                | n   | GPA Seneca (/4.0) | GPA York (/9.0) | % Failed Courses at York | # Credits Taken Per Year at York |
|--------------------------------|-----|-------------------|-----------------|--------------------------|----------------------------------|
| <b>Commerce</b>                | 241 | 3.3               | 5.8             | 2.3%                     | 19.5                             |
| <b>Economics &amp; Related</b> | 106 | 2.8               | 5.5             | 1.9%                     | 21.0                             |
| <b>Business and Society</b>    | 60  | 2.7               | 5               | 2.6%                     | 18.6                             |
| <b>Human Resources</b>         | 15  | 2.9               | 4.8             | 4.5%                     | 16.7                             |
| <b>Total</b>                   | 422 | 3.1               | 5.6             | 2.3%                     | 19.7                             |

Note: (1) Includes all Seneca graduates of two- or three-year business diploma programs who transferred to York's business degree completion pathways between fall 2013 and winter 2017.

Table 25. Graduation and retention rates of Seneca transfers to York's business and related degrees, graduates of Seneca's business credentials

| Major                          | 2013-2016 Entering Cohorts (n)* | First Year Retention (%) | 2-Year Graduation Rate (%) | 3-Year Graduation Rate (%) |
|--------------------------------|---------------------------------|--------------------------|----------------------------|----------------------------|
| <b>Commerce</b>                | 241                             | 85.0%                    | 26.1%                      | 38.6%                      |
| <b>Economics &amp; Related</b> | 106                             | 89.2%                    | 28.1%                      | 45.0%                      |
| <b>Business and Society</b>    | 60                              | 81.6%                    | 25.8%                      | 33.3%                      |
| <b>Human Resources</b>         | 15                              | 83.3%                    | ---                        | ---                        |
| <b>Total</b>                   | 422                             | 85.7%                    | 25.3%                      | 37.6%                      |

Notes: (1) Includes all Seneca business and related graduates who transferred to York's business and related degrees between fall 2013 and winter 2017. (2) "---" indicates cell size <5. (3) For the one-year retention calculation, students who entered York after the 2017 winter term were excluded (n = 86) and those who graduated by the one-year mark were included as retained. (2) For the two-year graduation rate calculation, students who entered York after the 2016 winter term were excluded (n = 185). (3) For the three-year graduation rate calculation, students who entered York after the 2015 winter term were excluded (n = 265).

The analysis of transfers to York's commerce degrees from Seneca's two- and three-year business diplomas (see Table 1 for program list) revealed that students entering York through the block transfer pathway had on average slightly higher Seneca grades than those entering through the articulated pathways, but received lower GPAs at York. Students who took the articulated pathway from accounting and finance had both the highest amount of transfer credit and the highest two- and three- year graduation rates.

Table 26. Graduation and retention rate of Seneca transfers to York's Bachelor of Commerce, graduates of Seneca's two- and three-year business diplomas

|   |  | n   | GPA<br>Seneca<br>(/4.0) | GPA<br>York<br>(/9.0) | First Year<br>Retention<br>Rate (%) | 2-Year<br>Graduation<br>Rate (%) | 3-Year<br>Graduation<br>Rate (%) | Average<br>Transfer<br>Credit |
|---|--|-----|-------------------------|-----------------------|-------------------------------------|----------------------------------|----------------------------------|-------------------------------|
| <b>Block<br/>Transfer</b>                       | 2-Year<br>Business<br>Grads                | 66  | 3.4                     | 5.6                   | 86.8%                               | 31.4%                            | 39.1%                            | 28.8                          |
|   | 3-Year<br>Business<br>Grads                | 44  | 3.4                     | 5.1                   | 81.3%                               | ---                              | ---                              | 39.5                          |
| <b>Articulated<br/>Pathways</b>                 | 2-Year<br>Accounting<br>Grads              | 81  | 3.2                     | 6                     | 90.0%                               | 19.2%                            | 40.5%                            | 29.8                          |
|   | 3-Year<br>Accounting<br>& Finance<br>Grads | 42  | 3.3                     | 6.5                   | 78.8%                               | 43.5%                            | 58.3%                            | 44.3                          |
| <b>Block &amp;<br/>Articulated<br/>Pathways</b> | 2-Year<br>Business<br>Grads                | 147 | 3.3                     | 5.8                   | 88.6%                               | 24.1%                            | 40.0%                            | 29.4                          |
|   | 3-Year<br>Business<br>Grads                | 86  | 3.3                     | 5.8                   | 80.0%                               | 29.2%                            | 34.6%                            | 41.9                          |
| <b>Grand Total</b>                              | 2 & 3-Yr                                   | 233 | 3.3                     | 5.8                   | 85.6%                               | 25.9%                            | 38.4%                            | 33.9                          |

Notes: (1) Includes all Seneca graduates of a two- or three-year business diploma program who transferred to York's Commerce degree programs between fall 2013 and winter 2017. (2) "---" indicates cell size <5. (3) For the one-year retention calculation, students who entered York after the 2017 winter term were excluded (n = 45) and those who graduated by the one-year mark were included as retained. (4) For the two-year graduation rate calculation, students who entered York after the 2016 winter term were excluded (n = 98). (5) For the three-year graduation rate calculation, students who entered York after the 2015 winter term were excluded (n = 147).

## UNIVERSITY TO SENECA BUSINESS DEGREES

The growth of degree offerings by Ontario colleges has created an additional pathway in Ontario's post-secondary education landscape: colleges as receivers of transfer students into their degree programs from both colleges and universities. As shown in Table 27, almost 200 students entered a Seneca commerce degree from either York or Ryerson during the five-year study period, with over half originating from the related program areas of business, commerce, or economics (54%), 27% from social sciences and humanities, and 19% from the sciences. Students were distributed across all of Seneca's commerce degrees, with the most commonly selected degrees being International Accounting and Finance, followed by Business Management.

Table 27. Pathways into Seneca's commerce degrees from university (York and Ryerson combined)

|   | Seneca Bachelor of Commerce Major        |                        |   |  |                                     | Total |
|---|--|------------------------|---|--|-------------------------------------|-------|
|   | International<br>Accounting<br>& Finance | Business<br>Management | International<br>Business<br>Management | Human<br>Resources<br>Strategy &<br>Technology | Financial<br>Services<br>Management |       |
| <b>Business/<br/>Economics/<br/>Commerce</b>      | 40                                       | 27                     | 15                                      | 9  | 14                                  | 105   |
| <b>Natural &amp; Applied<br/>Sciences</b>         | 12                                       | 6                      | 9                                       | 5  | 6                                   | 38    |
| <b>Social Sciences/<br/>Humanities/<br/>Other</b> | 12                                       | 15                     | 6                                       | 14   | 6                                   | 53    |
| <b>Total</b>                                      | 64                                       | 48                     | 30                                      | 28   | 26                                  | 196   |

Note: An additional nine students initially entered other Seneca non-commerce degree programs before entering a Seneca business degree program.

Table 28 depicts the pre- and post-transfer academic performance of students who transferred to a Seneca business degree, by subject area and sending university. Overall, results suggest that this group of transfer students performed poorly at university prior to transferring, with 85% obtaining a D or below at university. It appears that switching to Seneca was an alternate way to obtain a degree following poor performance at university. Once at Seneca, their performance improved, with averages in the C to C+ range. Students from Ryerson had lower GPAs both at Seneca entry and post-transfer, and a higher share of course failures. Seneca non-transfer students in business degree programs had higher GPAs at Seneca (2.5 vs. 2.3) and a lower rate of course failure.

Table 28. Academic performance pre- and post-transfer to a Seneca business degree program from university (York/Ryerson)

|   |                                    | n     | University GPA Before<br>Transfer |       |              | Seneca Outcomes<br>Post-Transfer |                     |
|---|------------------------------------|-------|-----------------------------------|-------|--------------|----------------------------------|---------------------|
|   |                                    |       | D &<br>Below                      | C     | B &<br>Above | GPA<br>(/4.0)                    | % Failed<br>Courses |
| <b>York</b>                                   | Business/ Economics/ Commerce      | 44    | 81.8%                             | 18.2% | 0.0%         | 2.5                              | 19.1%               |
|   | Natural & Applied Sciences         | 19    | 89.5%                             | 10.5% | 0.0%         | 2.5                              | 16.5%               |
|   | Social Sciences/ Humanities/ Other | 48    | 79.2%                             | 18.8% | 2.1%         | 2.4                              | 22.1%               |
| <b>Ryerson</b>                                | Business/ Economics/ Commerce      | 61    | 91.8%                             | 8.2%  | 0.0%         | 2.1                              | 27.2%               |
|   | Natural & Applied Sciences         | 19    | 89.5%                             | 5.3%  | 5.3%         | 2.3                              | 26.1%               |
|   | Social Sciences/ Humanities/ Other | 5     | ---                               | ---   | ---          | 2.8                              | 11.7%               |
| <b>Transfers from York or Ryerson (Total)</b> |                                    | 196   | 84.7%                             | 13.8% | 1.5%         | 2.3                              | 22.6%               |
| <b>Seneca Non-Transfer Degree Students</b>    |                                    | 1,411 | ---                               | ---   | ---          | 2.5                              | 17.4%               |

Table 29 presents the graduation and retention rates of university students who transferred to Seneca's business degree programs, by the last program area enrolled in at university. In

comparison to students who entered the program from York or Ryerson, Seneca students who had not transferred had slightly higher retention and graduation rates across all time points assessed. For example, by three years after entry, 36% of transfer students had left their program at Seneca without graduating compared to 28% of Seneca students who had not transferred from York or Ryerson. As seen with grades, Ryerson transfers were also less likely than York transfers to be still enrolled or to have graduated within three years of Seneca entry.

Table 29. Graduation and retention rate of university transfer students to Seneca's business degree programs by last program at university compared to Seneca non-transfer students whose first program was a Seneca business degree

|                                       |                                  | <b># Credits<br/>Earned /Yr<br/>at Seneca</b> | <b>First Year<br/>Graduated/<br/>Enrolled</b> | <b>2 Years<br/>Graduated/<br/>Enrolled</b> | <b>3 Years<br/>Graduated<br/>/ Enrolled</b> |
|---------------------------------------|----------------------------------|---|---|--|---|
| <b>York</b>                           | Business/Economics/Commerce      | 7.4   | 79.6%   | 73.8%                                      | 67.7%                                       |
|                                       | Natural & Applied Sciences       | 8.1   | 84.2%   | 66.7%                                      | 63.6%                                       |
|                                       | Social Sciences/Humanities/Other | 7.6   | 81.3%   | 75.0%                                      | 67.5%                                       |
| <b>Ryerson</b>                        | Business/Economics/Commerce      | 6.8   | 80.3%   | 70.7%                                      | 58.5%                                       |
|                                       | Natural & Applied Sciences       | 6.9   | 89.5%   | 75.0%                                      | 60.0%                                       |
|                                       | Social Sciences/Humanities/Other | 8.6   | ---   | ---  | ---   |
| <b>Transfers from York or Ryerson</b> |                                  | <b>7.3</b>                                    | <b>81.6%</b>                                  | <b>72.8%</b>                               | <b>64.0%</b>                                |
| <b>Seneca Non-Transfer Students</b>   |                                  | <b>7.8</b>                                    | <b>85.9%</b>                                  | <b>80.0%</b>                               | <b>72.1%</b>                                |

Note: (1) “---” cells indicate cell size <5 or 0. (2) Seneca non-transfer student population who entered a Seneca business degree program (n = 1,411).

Table 30 presents pathways to Seneca’s business graduate certificate programs by university and university program area. Seneca attracts far more York graduates than Ryerson graduates to its business-related graduate certificate programs, with York graduates comprising 85% of the total intake. Overall, the graduate certificate program with the largest intake of transfer students from York or Ryerson was the Human Resources Management program, followed by the program in Public Relations – Corporate Communications. Among students who transferred from York to a Seneca graduate certificate program, 83% came from a university program in social sciences, humanities, or “other” program. Alternatively, among students who transferred from Ryerson to a Seneca graduate certificate program, only 41% came from social sciences, humanities, or “other” university programs, and 46% came from a university program in business, economics, or commerce.

Table 30. Pathways to Seneca business graduate certificate programs by university and university program area

| University-to-College Transfer Pathway        |                         |                             |                                     |                         |                             |                                     |             |             |
|---|-------------------------|-----------------------------|-------------------------------------|-------------------------|-----------------------------|-------------------------------------|-------------|-------------|
| Seneca Business Graduate Certificate Entered  | York to Seneca          |                             |                                     | Ryerson to Seneca       |                             |                                     | Total (n)   | % Total     |
|   | Busin/<br>Econ/<br>Comm | Nat &<br>Applied<br>Science | Social<br>Science/<br>Hum/<br>Other | Busin/<br>Econ/<br>Comm | Nat &<br>Applied<br>Science | Social<br>Science/<br>Hum/<br>Other |             |             |
| Human Resources Management                    | 24                      | 2                           | 133                                 | 11                      | 2                           | 9                                   | 181         | 34%         |
| PR – Corporate Communications                 | 3                       | 0                           | 109                                 | 7                       | 0                           | 8                                   | 127         | 24%         |
| Government Relations                          | 1                       | 0                           | 26                                  | 0                       | 0                           | 2                                   | 29          | 6%          |
| Event Marketing – Sports, Entertainment, Arts | 4                       | 1                           | 15                                  | 3                       | 0                           | 5                                   | 28          | 5%          |
| Global Logistics & Supply Chain Management    | 8                       | 1                           | 8                                   | 5                       | 2                           | 0                                   | 24          | 5%          |
| Public Administration                         | 7                       | 0                           | 13                                  | 1                       | 0                           | 0                                   | 21          | 4%          |
| Marketing Management                          | 1                       | 1                           | 14                                  | 1                       | 1                           | 2                                   | 20          | 4%          |
| Professional Accounting Practice              | 6                       | 0                           | 10                                  | 1                       | 1                           | 1                                   | 19          | 4%          |
| Project Management – Environmental            | 0                       | 0                           | 13                                  | 0                       | 2                           | 3                                   | 18          | 3%          |
| Green Business Management                     | 0                       | 0                           | 11                                  | 1                       | 0                           | 0                                   | 12          | 2%          |
| Non-profit Leadership and Management          | 3                       | 0                           | 5                                   | 0                       | 1                           | 2                                   | 11          | 2%          |
| Other Programs*                               | 10                      | 2                           | 17                                  | 7                       | 2                           | 1                                   | 39          | 7%          |
| <b>Total</b>                                  | <b>67</b>               | <b>7</b>                    | <b>374</b>                          | <b>37</b>               | <b>11</b>                   | <b>33</b>                           | <b>529</b>  | <b>100%</b> |
| <b>% Total</b>                                | <b>13%</b>              | <b>1%</b>                   | <b>71%</b>                          | <b>7%</b>               | <b>2%</b>                   | <b>6%</b>                           | <b>100%</b> |             |

\*Nine graduate certificate programs had fewer than 10 students originating from York and Ryerson and are combined in the above table.

Table 31 presents the academic performance of students pre- and post-transfer to a Seneca graduate certificate program by transfer pathway. Prior to entering Seneca's graduate certificate programs, York and Ryerson students exiting university achieved an overall GPA of 5.8 (C+) and 2.9 (B-), respectively. During their Seneca studies, these students performed well, achieving an overall GPA of 3.6 (B+).

Table 31. Academic performance of students pre- and post-transfer to a Seneca business graduate certificate program by transfer pathway

| Seneca Business Graduate Certificate          | University-to-College Transfer Pathway |            |                   |            |
|---|--|------------|-------------------|------------|
|   | York to Seneca                         |            | Ryerson to Seneca |            |
|   | York GPA                               | Seneca GPA | Ryerson GPA       | Seneca GPA |
| Human Resources Management                    | 5.6                                    | 3.6        | 2.7               | 3.6        |
| Corporate Communications                      | 5.9                                    | 3.9        | 2.9               | 3.9        |
| Event Marketing - Sports, Entertainment, Arts | 5.7                                    | 3.8        | 2.9               | 3.9        |
| Government Relations                          | 5.8                                    | 3.5        | -                 | -          |
| Global Logistics & Supply Chain Management    | 5.6                                    | 3.2        | 2.9               | 3.7        |
| Public Administration                         | 6                                      | 3.5        | -                 | -          |
| Marketing Management                          | 5.4                                    | 2.9        | -                 | -          |
| Professional Accounting Practice              | 5.7                                    | 3.1        | -                 | -          |
| Project Management - Environmental            | 6.5                                    | 3.7        | 2.9               | 3.6        |
| Green Business Management                     | 5.8                                    | 3.5        | -                 | -          |
| Non-profit Leadership and Management          | 6.2                                    | 3.5        |                   |            |
| Financial Services Compliance Administration  | -                                      | -          | 2.9               | 2.9        |
| Fraud Examination & Forensic Accounting       | 6.1                                    | 3.9        | -                 | -          |
| International Business Management             | 6.3                                    | 3.4        | -                 | -          |
| <b>Total</b>                                  | <b>5.8</b>                             | <b>3.6</b> | <b>2.9</b>        | <b>3.6</b> |

Notes: (1) "-" cells indicate cell size <5 or 0. (2) Total GPA estimates include all university transfer students who entered Seneca graduate certificate programs, including programs not shown due to low cell counts.

Table 32 presents the first-year graduation rate for York and Ryerson students who transferred to a business graduate certificate program at Seneca. Overall, as seen for the grades in Table 31, students are successful post-transfer. Across all graduate certificate programs entered, the first-year graduation rate for university transfer students is 84%. The first-year graduation rate is also similar when comparing students who transferred to Seneca from York (84%) and Ryerson (82%).

Table 32. First-year graduation rate for students transferring from York/Ryerson to Seneca's business graduate certificate programs

| Seneca Business Graduate Certificate Entered  | York             |                  | Ryerson    |                          |
|---|------------------|------------------|------------|--------------------------|
|   | 1-year grad rate | 1-year grad rate | n          | Overall 1-year grad rate |
| Human Resources Management                    | 82%              | 77%              | 181        | 81.8%                    |
| Corporate Communication                       | 90%              | 87%              | 127        | 89.8%                    |
| Event Marketing – Sports, Entertainment, Arts | 75%              | 71%              | 27         | 74.1%                    |
| Government Relations                          | 79%              | -                | 26         | 80.8%                    |
| Global Logistics & Supply Chain Management    | 88%              | 100%             | 24         | 91.7%                    |
| Public Administration                         | 75%              | -                | 21         | 76.2%                    |
| Marketing Management                          | 94%              | -                | 20         | 90.0%                    |
| Professional Accounting Practice              | 50%              | -                | 19         | 52.6%                    |
| Project Management – Environmental            | 92%              | 100%             | 18         | 94.4%                    |
| Green Business Management                     | 82%              | -                | 12         | 83.3%                    |
| Non-profit Leadership and Management          | 100%             | -                | 11         | 81.8%                    |
| Financial Services Compliance Administration  | -                | 80%              | 9          | 77.8%                    |
| Fraud Examination & Forensic Accounting       | 100%             | -                | 6          | 100.0%                   |
| International Business Management             | 100%             | -                | 5          | 100.0%                   |
| Brand Management                              | -                | 100%             | 5          | 100.0%                   |
| Event Management – Event & Exhibit Design     | -                | 100%             | 5          | 100.0%                   |
| Project Management – Information Technology   | -                | 50%              | 5          | 60.0%                    |
| <b>Total</b>                                  | <b>84%</b>       | <b>82%</b>       | <b>526</b> | <b>83.5%</b>             |

Notes: (1) “-” indicates cell size <5 or 0. (2) Total graduation rates include all university transfer students who entered a Seneca business graduate certificate program, including programs not shown due to low cell counts.

## REGRESSION RESULTS

For each outcome of interest, four regression models were analyzed:

1. Model 1: Base population - gender, age, status in Canada, GPA, program, credential, DCTO use, graduation status, and transfer credit.
2. Model 2: Model 1 plus high school variables and neighbourhood income data. Excludes international students and those without high school grades.
3. Model 3: Model 1 plus Seneca English assessment scores and variables from the entering student survey (e.g., parent's education). Excludes all students entering Seneca's graduate certificate programs and degree programs.
4. Model 4: Model 3 plus Seneca math assessment scores.

The model-building methodology is described in Appendix B.

## PROPENSITY OF SENECA BUSINESS STUDENTS TO TRANSFER TO UNIVERSITY

Table 33 contains the results of the logistic regression models that investigated the odds of Seneca's business students to transfer to York or Ryerson, excluding students who originated from either university.

Across all models, older students (23 and older) had lower odds than younger students of transferring from a Seneca business program to York or Ryerson. Differences by gender varied by model. In Model 1, which contains no information on skills assessment scores or high

school grades, gender was not associated with a student's odds of transferring to university; nor was this association observed in Model 4, which contains math skills assessment. Alternatively, in Model 2 and Model 3, which contain high school grades and English assessment scores, respectively, males were observed to have higher odds of transferring to university.

International students were only observed to have lower odds of transferring to university in the models that excluded students enrolled in Seneca graduate certificate and degree programs, and included assessment scores. In these same models, students who reported English as their first language were also observed to have lower odds of transferring to university.

For program-related variables, enrollment in hospitality and tourism programs was associated with lower odds of transferring to university compared to enrollment in accounting and finance programs at Seneca. Additionally, enrollment in Seneca's two-year diploma programs was associated with higher odds of transferring to university compared to enrollment in graduate certificate programs and degree programs, but with lower odds of transferring to university compared to enrollment in three-year diploma programs.

For academic and skills-related variables (Model 2), students who took more than half of their high school senior courses at the university or mixed preparation level had higher odds of transferring to York or Ryerson from Seneca. Variables related to the number of high school course failures and high school grades were not found to be significant. However, grade average at Seneca was a strong influencer on transfer across all models. The odds of transferring to university were 9 to 13 times higher for Seneca students with an average of B or above compared to Seneca students with an average of D or below. Although English-language skills did not influence propensity to transfer, higher math assessment scores at Seneca entry (calculated as the average algebra and arithmetic Accuplacer scores) were associated with higher odds of transferring to university. Across all models, graduating from a Seneca program was not associated with the odds of transferring to York or Ryerson.

Having plans for university at Seneca entry and obtaining transfer advising were both strongly associated with higher odds of transferring to university, whereas previous self-reported university attendance was not.

In Models 2, 3, and 4, neighbourhood income and parent's education, respectively, were not significantly associated with a student's odds of transferring to York or Ryerson.

Table 33. Regression results: Propensity of Seneca students to transfer to university

| VARIABLES   | VARIABLES                           | Model 1           | Model 2            | Model 3            | Model 4            |
|---|-------------------------------------|-------------------|--------------------|--------------------|--------------------|
| <b>Gender</b><br>(Ref: Female)  | Male                                |                   | 1.44***<br>(0.16)  | 1.21**<br>(0.10)   |                    |
|   |                                     |                   |                    |                    |                    |
| <b>Start Age in Business Program at Seneca</b><br>(Ref: <19)                                | 19-20                               | 1.07<br>(0.10)    | 0.86<br>(0.10)     | 0.97<br>(0.10)     | 0.92<br>(0.10)     |
|   | 21-22                               | 0.84<br>(0.09)    | 0.80<br>(0.12)     | 0.90<br>(0.11)     | 0.83<br>(0.11)     |
|   | 23-24                               | 0.50***<br>(0.07) | 0.49***<br>(0.11)  | 0.62***<br>(0.10)  | 0.51***<br>(0.09)  |
|   | 25+                                 | 0.30***<br>(0.04) | 0.46***<br>(0.10)  | 0.39***<br>(0.06)  | 0.32***<br>(0.05)  |
| <b>Citizenship Status</b><br>(Ref: Canadian Citizen)  | International                       |                   | ---                | 0.76***<br>(0.08)  | 0.64***<br>(0.07)  |
|   | Domestic - Other                    |                   |                    | 1.06<br>(0.13)     | 1.01<br>(0.13)     |
| <b>Used DCTO</b><br>(Ref: No)   | Yes                                 | 8.05***<br>(0.65) | 7.80***<br>(0.91)  | 7.10***<br>(0.65)  | 6.78***<br>(0.64)  |
| <b>Seneca Faculty of First Business Program</b><br>(Ref: Accounting and Financial Services) | Human Resources & Leadership        | 0.65***<br>(0.10) | 0.70<br>(0.14)     | 0.77<br>(0.14)     | 0.95<br>(0.17)     |
|   | International Business & Management | 0.92<br>(0.07)    | 1.01<br>(0.12)     | 0.91<br>(0.09)     | 1.07<br>(0.10)     |
|   | Marketing                           | 0.93<br>(0.11)    | 0.85<br>(0.15)     | 0.95<br>(0.13)     | 1.11<br>(0.17)     |
|   | Hospitality & Tourism               | 0.20***<br>(0.04) | 0.31***<br>(0.08)  | 0.27***<br>(0.06)  | 0.28***<br>(0.09)  |
|   | Public Admin/Gov't Relations        | 0.80<br>(0.53)    | 1.65<br>(2.35)     | 0.69<br>(0.19)     | 1.84<br>(1.21)     |
|   | Arts, Technology, Science Mgt.      | 0.52***<br>(0.12) | 0.39***<br>(0.14)  |                    |                    |
|   |                                     |                   |                    |                    |                    |
| <b>Seneca GPA, All Courses Ever Attempted on 4-point Scale</b><br>(Ref: <2)                 | 2-3                                 | 3.97***<br>(0.49) | 4.12***<br>(0.69)  | 4.61***<br>(0.65)  | 4.43***<br>(0.65)  |
|   | 3-3.75                              | 9.28***<br>(1.13) | 11.38***<br>(1.92) | 12.71***<br>(1.80) | 11.00***<br>(1.64) |
|   | 3.75-4                              | 8.73***<br>(1.31) | 12.22***<br>(2.77) | 11.72***<br>(2.07) | 9.09***<br>(1.69)  |
| <b>Credential of First Business Program</b><br>(Ref: 2-Yr Diploma)                          | 3-Year Diploma                      | 1.45***<br>(0.11) | 1.59***<br>(0.21)  | 1.31***<br>(0.12)  | 1.37***<br>(0.13)  |
|   | 1-Year Certificate                  | 1.34<br>(0.55)    | 1.38<br>(0.87)     | 1.19<br>(0.59)     | 1.15<br>(0.65)     |
|   | Grad Certificate                    | 0.11***<br>(0.04) | 0.06***<br>(0.06)  | ---                | ---                |
|   | Bachelor's Degree                   | 0.47***<br>(0.08) | 0.48***<br>(0.11)  | ---                | ---                |
| <b>Graduate from Seneca</b><br>(Ref: No)  | Yes                                 |                   |                    |                    |                    |
| <b>DA Income Group</b><br>(Ref: Low Income)   | Mid Income                          |                   |                    |                    |                    |

| VARIABLES  | VARIABLES       | Model 1           | Model 2           | Model 3           | Model 4           |
|--|-----------------|-------------------|-------------------|-------------------|-------------------|
|  | High Income     | ---               |                   | ---               | ---               |
| >50% Senior HS Courses U/M/OAC Level (Ref: No)             | Yes             | ---               | 1.34**<br>(0.15)  | ---               | ---               |
| HS Grade 11 to OAC GPA                                     | 100% Scale      | ---               |                   | ---               | ---               |
| Number of HS Grade 11/12 Courses a Student Failed (Ref: 0) | 1-2             | ---               |                   | ---               | ---               |
|  | ≥3              | ---               |                   | ---               | ---               |
| Student Eligible for University (Ref: No)                  | Yes             | ---               |                   | ---               | ---               |
| Student's First Language (Ref: Other)                      | English         | ---               | ---               | 0.70***<br>(0.07) | 0.81**<br>(0.08)  |
| Plans for University (Ref: No)                             | Yes             | ---               | ---               | 3.09***<br>(0.27) | 2.80***<br>(0.26) |
| Last School Attended - University (Ref: No)                | Yes             | ---               | ---               |                   |                   |
| One Parent has a Degree (Ref: No)                          | Yes             | ---               | ---               |                   |                   |
| English Comprehension Assessment Score                     | 120 Point Scale | ---               | ---               |                   |                   |
| Average Math Assessment Score                              | 120 Point Scale | ---               | ---               | ---               | 1.01***<br>(0.00) |
| Constant   |                 | 0.00***<br>(0.00) | 0.00***<br>(0.00) | 0.00***<br>(0.00) | 0.00***<br>(0.00) |
| R-Squared  |                 | 0.2683            | 0.2719            | 0.2879            | 0.2895            |
| Observations   |                 | 22,987            | 9,599             | 14,708            | 12,353            |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca graduate certificate programs or degree programs were excluded. (6) Variables investigated but not selected and not presented in above table: year of entry to Seneca business program.

### SUCCESS AT SENECA: YORK AND RYERSON TRANSFER STUDENTS COMPARED TO NON-TRANSFER POPULATION

Table 34 presents the results of regression analyses that investigated the effect of various factors on the academic performance of York and Ryerson students who transferred to Seneca, compared to Seneca's non-transfer business students. With regard to Seneca GPA, students from both universities outperformed non-transfer Seneca business students (Model 1). However, when either high school grades or skills assessment results were included (Models 2, 3 and 4), the positive observed effect of transfer from a university to Seneca on Seneca GPA disappeared. For example, results of the regression model investigating the effect of transfer on Seneca GPA (Model 2), when controlling for high school variables, suggest transfer students from Ryerson obtained lower grades compared to non-transfer Seneca students. Additionally, transfer students from York achieved lower Seneca GPAs

compared to non-transfer Seneca students when controlling for math assessment scores (Model 4).

With regard to student-related characteristics, overall findings suggest that females compared to males, and older students compared to younger, were more likely to achieve higher overall GPAs at Seneca. Canadian citizens, compared to non-citizens, and students whose first language was English were each less likely to achieve higher Seneca GPAs. Transfer students who entered hospitality and tourism or marketing programs at Seneca were more likely to achieve higher grades than transfers who entered accounting and financial services programs at Seneca. Additionally, students who entered bachelor degree programs achieved higher overall Seneca GPAs than students who entered two-year diploma programs at Seneca.

As shown in Model 2 (contains high school variables), students who took more than half of their high school senior courses at the university or mixed preparation level were more likely to achieve higher GPAs at Seneca. Additionally, university eligibility based on high school performance was positively associated with overall Seneca GPA. Failure in one or more high school courses was negatively associated with the overall GPA achieved at Seneca. Assessment scores at Seneca entry were also positively associated with students' overall GPA at Seneca.

Interestingly, students who planned to attend university after college graduation obtained a lower GPA at Seneca.

Table 34. Regression results: Grades at Seneca for students transferring from York/Ryerson and non-transfer Seneca students

| VARIABLES  | VARIABLES                              | Model 1            | Model 2            | Model 3            | Model 4            |
|--|--|--------------------|--------------------|--------------------|--------------------|
| <b>Transfer Student<br/>(Ref: Seneca Only)</b>   | York                                   | 0.15***<br>(0.04)  | -0.07<br>(0.04)    | -0.03<br>(0.04)    | -0.10**<br>(0.05)  |
|  | Ryerson                                | 0.19***<br>(0.06)  | -0.12**<br>(0.06)  | 0.12<br>(0.07)     | 0.06<br>(0.07)     |
| <b>Gender<br/>(Ref: Female)</b>  | Male                                   | -0.40***<br>(0.01) | -0.12***<br>(0.02) | -0.40***<br>(0.02) | -0.41***<br>(0.02) |
| <b>Start Age in Business<br/>Program at Seneca<br/>(Ref: &lt;19)</b>                                 | 19-20                                  | -0.15***<br>(0.02) | -0.01<br>(0.02)    | -0.18***<br>(0.02) | -0.19***<br>(0.02) |
|  | 21-22                                  | -0.03<br>(0.02)    | 0.12***<br>(0.03)  | -0.11***<br>(0.03) | -0.13***<br>(0.03) |
|  | 23-24                                  | 0.19***<br>(0.03)  | 0.28***<br>(0.04)  | 0.04<br>(0.03)     | 0.03<br>(0.03)     |
|  | 25+                                    | 0.57***<br>(0.02)  | 0.48***<br>(0.03)  | 0.36***<br>(0.03)  | 0.37***<br>(0.03)  |
| <b>Citizenship Status<br/>(Ref: Canadian Citizen)</b>  | International                          | 0.22***<br>(0.02)  | ---                | 0.36***<br>(0.02)  | 0.23***<br>(0.02)  |
|  | Domestic - Other                       | 0.15***<br>(0.02)  | -0.07***<br>(0.03) | 0.27***<br>(0.03)  | 0.18***<br>(0.03)  |
| <b>Used DCTO<br/>(Ref: No)</b>   | Yes                                    | 0.48***<br>(0.04)  | 0.46***<br>(0.04)  | 0.50***<br>(0.04)  | 0.48***<br>(0.04)  |
| <b>Seneca Faculty of First<br/>Business Program<br/>(Ref: Accounting and<br/>Financial Services)</b> | Human Resources &<br>Leadership        | -0.02<br>(0.03)    | 0.16***<br>(0.03)  | -0.01<br>(0.04)    | 0.15***<br>(0.04)  |
|  | International Business<br>& Management | -0.10***<br>(0.02) | 0.02<br>(0.02)     | -0.04**<br>(0.02)  | 0.04**<br>(0.02)   |
|  | Marketing                              | 0.16***            | 0.26***            | 0.13***            | 0.11***            |

| VARIABLES   | VARIABLES                         | Model 1 | Model 2  | Model 3  | Model 4  |
|---|-----------------------------------|---------|----------|----------|----------|
|   |                                   | (0.03)  | (0.03)   | (0.03)   | (0.03)   |
|   | Hospitality & Tourism             | 0.19*** | 0.46***  | 0.25***  | 0.32***  |
|   |                                   | (0.02)  | (0.03)   | (0.02)   | (0.04)   |
|   | Arts, Technology,<br>Science Mgt. | -0.01   | 0.07     | 0.01     | -0.21    |
|   |                                   | (0.04)  | (0.05)   | (0.05)   | (0.14)   |
| <b>First Business Credential<br/>at Seneca<br/>(Ref: 2-Year Diploma)</b>      | 1-Year Certificate                | -0.02   | -0.20**  |          |          |
|   |                                   | (0.07)  | (0.09)   |          |          |
|   | 3-Year Diploma                    | -0.01   | -0.03    |          |          |
|   |                                   | (0.02)  | (0.02)   |          |          |
|   | Bachelor’s Degree                 | 0.28*** | 0.08**   | ---      | ---      |
|   |                                   | (0.03)  | (0.03)   |          |          |
| <b>DA Income Group<br/>(Ref: Low Income)</b>                                  | Mid Income                        | ---     | 0.08***  | ---      | ---      |
|   |                                   |         | (0.02)   |          |          |
|   | High Income                       | ---     | 0.05**   | ---      | ---      |
|   |                                   |         | (0.02)   |          |          |
| <b>&gt;50% Senior HS Courses<br/>U/M/OAC Level<br/>(Ref: No)</b>              | Yes                               | ---     | 0.25***  | ---      | ---      |
|   |                                   |         | (0.02)   |          |          |
| <b>HS GPA (Grade 11/12)</b>   | 100% Scale                        | ---     | 0.06***  | ---      | ---      |
|   |                                   |         | (0.00)   |          |          |
| <b>Number of HS Grade<br/>11/12 Courses a Student<br/>Failed<br/>(Ref: 0)</b> | 1-2                               | ---     | -0.21*** | ---      | ---      |
|   |                                   |         | (0.02)   |          |          |
|   | ≥3                                | ---     | -0.30*** | ---      | ---      |
|   |                                   |         | (0.03)   |          |          |
| <b>Student Eligible for<br/>University<br/>(Ref: No)</b>                      | Yes                               | ---     | 0.07***  | ---      | ---      |
|   |                                   |         | (0.03)   |          |          |
| <b>Student's First Language<br/>(Ref: Other)</b>                              | English                           | ---     | ---      | -0.10*** |          |
|   |                                   |         |          | (0.02)   |          |
| <b>Plans for University<br/>(Ref: No)</b>                                     | Yes                               | ---     | ---      | -0.18*** | -0.16*** |
|   |                                   |         |          | (0.02)   | (0.02)   |
| <b>Last School Attended -<br/>University<br/>(Ref: No)</b>                    | Yes                               | ---     | ---      | 0.24***  | 0.15***  |
|   |                                   |         |          | (0.02)   | (0.02)   |
| <b>English Comprehension<br/>Assessment Score</b>                             | 120 Point Scale                   | ---     | ---      | 0.01***  | 0.01***  |
|   |                                   |         |          | (0.00)   | (0.00)   |
| <b>Math Assessment Score</b>  | 120 Point Scale                   | ---     | ---      | ---      | 0.01***  |
|   |                                   |         |          |          | (0.00)   |
| <b>Constant</b>   |                                   | 2.60*** | -1.94*** | 1.96***  | 1.44***  |
|   |                                   | (0.03)  | (0.12)   | (0.04)   | (0.05)   |
| <b>Observations</b>   |                                   | 19,156  | 8,953    | 13,799   | 11,373   |
| <b>R-squared</b>  | R-squared                         | 0.15    | 0.33     | 0.25     | 0.28     |

Notes: (1) Standard errors in parentheses. (2) \*\*\*p<0.01, \*\*p<0.05. (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca degree programs were excluded. (6) For all models, students entering Seneca’s graduate certificate programs were excluded. (7) Variables investigated but not selected and not presented in above table: year of entry to Seneca business program and “One parent has a degree”.

Table 35 presents the regression results for models investigating the effect of various factors on the odds of graduating within the standard program length for students transferring to

Seneca from York or Ryerson compared to non-transfer Seneca business students. Similar to the results investigating Seneca GPA (Table 34), Model 1 presents evidence of higher odds of graduating on time for students who transferred from university, particularly York, compared to non-transfer Seneca business students. This positive effect disappeared when controlling for high school performance (Model 2) or skills assessment (Models 3 and 4).

Again, female students compared to male students, and older students compared to younger, had higher odds of graduating within the standard program length. International students compared to domestic students, and students’ whose first language was not English, were also more likely to graduate on time.

Students whose first program at Seneca was in the program areas of hospitality and tourism or human resources were more likely to graduate within the standard program length than students whose first program at Seneca was in accounting and financial services. The odds of graduating on time were higher for students entering bachelor degree programs compared to two-year diploma programs.

Similar to the results presented in Table 34, students who took more than half of their high school senior courses at the university or mixed preparation level had a higher likelihood of graduating within the standard program length. Additionally, being eligible for university based on high school performance, and higher assessment score upon Seneca entry, were also associated with higher odds of graduating on time. Students who had failed one or more high school courses had lower odds of graduating within the standard program length.

Interestingly, students who indicated on the entering Seneca student survey that they planned to attend university after graduation had lower odds of graduating on time. Alternatively, students who indicated they had attended a university prior to entering Seneca had a higher likelihood of graduating within the standard program length.

Table 35. Regression results: Odds of graduating on time at Seneca for students transferring from York/Ryerson and non-transfer Seneca students

| VARIABLES  | VARIABLES                       | Model 1           | Model 2           | Model 3           | Model 4           |
|--|---------------------------------|-------------------|-------------------|-------------------|-------------------|
| <b>Transfer Student<br/>(Ref: Seneca Only)</b>   | York                            | 1.25***<br>(0.11) | 0.96<br>(0.11)    | 0.99<br>(0.10)    | 0.87<br>(0.10)    |
|  | Ryerson                         | 1.27<br>(0.17)    | 0.79<br>(0.13)    | 1.02<br>(0.17)    | 0.97<br>(0.18)    |
| <b>Gender<br/>(Ref: Female)</b>  | Male                            | 0.60***<br>(0.02) | 0.73***<br>(0.04) | 0.59***<br>(0.02) | 0.59***<br>(0.03) |
| <b>Start Age in Business<br/>Program at Seneca</b>   | 1-Year Increments               | 1.05***<br>(0.00) | 1.03***<br>(0.01) | 1.03***<br>(0.00) | 1.03***<br>(0.00) |
| <b>Citizenship Status<br/>(Ref: Canadian Citizen)</b>  | International                   | 2.60***<br>(0.10) | ---               | 2.76***<br>(0.14) | 2.45***<br>(0.15) |
|  | Domestic – Other                | 1.34***<br>(0.07) |                   | 1.43***<br>(0.09) | 1.34***<br>(0.09) |
| <b>Used DCTO<br/>(Ref: No)</b>   | Yes                             | 2.08***<br>(0.17) | 2.22***<br>(0.26) | 2.22***<br>(0.21) | 2.16***<br>(0.21) |
| <b>Seneca Faculty of First<br/>Business Program<br/>(Ref: Accounting &amp;<br/>Financial Services)</b> | Human Resources<br>& Leadership | 1.15*<br>(0.09)   | 1.29***<br>(0.13) | 1.11<br>(0.11)    | 1.38***<br>(0.14) |
|  | International                   | 0.93<br>(0.04)    | 1.06<br>(0.07)    | 1.00<br>(0.05)    | 1.09<br>(0.06)    |
|  | Business &<br>Management        |                   |                   |                   |                   |

| VARIABLES   | VARIABLES                            | Model 1           | Model 2           | Model 3           | Model 4           |
|---|--------------------------------------|-------------------|-------------------|-------------------|-------------------|
|   | Marketing                            | 1.06<br>(0.07)    | 1.20*<br>(0.11)   | 1.01<br>(0.07)    | 1.07<br>(0.09)    |
|   | Hospitality & Tourism                | 1.24***<br>(0.07) | 2.07***<br>(0.18) | 1.33***<br>(0.09) | 1.47***<br>(0.13) |
|   | Arts, Technology, Science Management | 0.98<br>(0.10)    | 1.15<br>(0.16)    | 1.10<br>(0.12)    | 0.49*<br>(0.21)   |
| <b>First Business Credential at Seneca (Ref: 2-Year Diploma)</b>  | 1-Year Certificate                   | 0.78*<br>(0.12)   | 0.77<br>(0.19)    | 0.85<br>(0.14)    | 0.86<br>(0.20)    |
|   | 3-Year Diploma                       | 1.04<br>(0.04)    | 1.28***<br>(0.09) | 1.19***<br>(0.06) | 1.14**<br>(0.06)  |
|   | Bachelor’s Degree                    | 1.54***<br>(0.11) | 1.44***<br>(0.14) | ---               | ---               |
| <b>&gt;50% Senior HS Courses U/M/OAC Level (Ref: No)</b>          | Yes                                  | ---               | 1.36***<br>(0.08) | ---               | ---               |
| <b>HS GPA</b>   | 100% Scale                           | ---               | 1.08***<br>(0.00) | ---               | ---               |
| <b>Number of HS Grade 11/12 Courses a Student Failed (Ref: 0)</b> | 1-2                                  | ---               | 0.72***<br>(0.05) | ---               | ---               |
|   | ≥3                                   | ---               | 0.65***<br>(0.05) | ---               | ---               |
| <b>Student Eligible for University (Ref: No)</b>                  | Yes                                  | ---               | 1.16**<br>(0.08)  | ---               | ---               |
| <b>Student's First Language (Ref: Other)</b>                      | English                              | ---               | ---               | 0.85***<br>(0.04) | ---               |
| <b>Plans for University (Ref: No)</b>                             | Yes                                  | ---               | ---               | 0.65***<br>(0.03) | 0.67***<br>(0.03) |
| <b>Last School Attended – University (Ref: No)</b>                | Yes                                  | ---               | ---               | 1.46***<br>(0.08) | 1.31***<br>(0.08) |
| <b>English Comprehension Assessment Score</b>                     | 120 Point Scale                      | ---               | ---               | 1.01***<br>(0.00) | 1.01***<br>(0.00) |
| <b>Math Assessment Score</b>                                      | 120 Point Scale                      | ---               | ---               | ---               | 1.01***<br>(0.00) |
| <b>Constant</b>   |                                      | 0.30***<br>(0.03) | 0.00***<br>(0.00) | 0.21***<br>(0.03) | 0.11***<br>(0.02) |
| <b>R-squared</b>  |                                      | 0.0692            | 0.1018            | 0.0908            | 0.1022            |
| <b>Observations</b>   | Observations                         | 16,683            | 8,344             | 12,476            | 10,147            |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca degree programs were excluded. (6) For all models, students entering Seneca’s graduate certificate programs were excluded. (7) Variables investigated but not selected and not presented in above table: year of entry to Seneca business program, DA income group, and “One parent has a degree”.

## SUCCESS OF YORK AND RYERSON TRANSFER STUDENTS AT SENECA

This section examines the factors influencing academic success at Seneca for the population of students that transferred from York or Ryerson.

Results from the regression analyses of various factors affecting the overall Seneca GPA of university transfer students are presented in Table 36. Students transferring from York or Ryerson obtained higher GPAs at Seneca if they were female, came from a middle-income neighbourhood rather than a low-income neighbourhood, and had a parent with a degree. Students with Canadian citizenship were observed to obtain lower grades at Seneca relative to domestic students only in the model containing high school background (Model 2). Additionally, in Model 2, older students were observed to be more likely to achieve higher grades at Seneca compared to younger students.

University students’ academic and skills background before transfer to Seneca was associated with Seneca GPAs post-transfer. Transfer students who had obtained a high school average of 80% or higher, and who had not failed any high school courses compared to failing three or more, were all more likely to obtain a higher GPA at Seneca. As well, higher scores in both English and math assessment at Seneca entry were significantly associated with a higher Seneca GPA for university transfer students. A higher university cumulative GPA before Seneca entry was also associated with higher Seneca grades post-transfer. Interestingly, an association was not observed between university graduation before transfer and a higher GPA at Seneca, in contrast to the results in the descriptive data.

For university transfer students, program factors significantly increased the odds of achieving higher GPAs at Seneca: Students who entered hospitality and tourism or marketing obtained higher grades at Seneca than students who entered accounting and finance programs; similarly, transfer students entering graduate certificate programs obtained higher grades at Seneca than transfer students entering Seneca’s two-year diploma programs.

Interestingly, the small proportion of transfer students who used the DCTO’s advising services obtained higher grades at Seneca compared to those who did not.

Table 36. Regression results: Grades at Seneca for students transferring from York/Ryerson

| VARIABLES  | VARIABLES        | Model 1            | Model 2           | Model 3            | Model 4            |
|--|------------------|--------------------|-------------------|--------------------|--------------------|
| <b>University Transferred From (Ref: York)</b>               | Ryerson          | 0.05<br>(0.05)     | -0.00<br>(0.07)   | 0.09<br>(0.08)     | 0.05<br>(0.09)     |
| <b>Gender (Ref: Female)</b>                                  | Male             | -0.22***<br>(0.04) | -0.15**<br>(0.06) | -0.28***<br>(0.07) | -0.31***<br>(0.08) |
| <b>Start Age in Business Program at Seneca (Ref: &lt;19)</b> | 19-20            |                    | 0.37<br>(0.21)    |                    |                    |
|  | 21-22            |                    | 0.43**<br>(0.21)  |                    |                    |
|  | 23-24            |                    | 0.44**<br>(0.21)  |                    |                    |
|  | 25+              |                    | 0.70***<br>(0.21) |                    |                    |
| <b>Citizenship Status (Ref: Canadian Citizen)</b>            | International    |                    | ---               |                    |                    |
|  | Domestic – Other |                    | -0.42***          |                    |                    |

| VARIABLES  | VARIABLES                            | Model 1           | Model 2            | Model 3           | Model 4           |
|--|--------------------------------------|-------------------|--------------------|-------------------|-------------------|
|  |                                      |                   | (0.14)             |                   |                   |
| <b>Used DCTO (Ref: No)</b>   | Yes                                  | 0.56***<br>(0.12) | 0.50***<br>(0.15)  | 0.66***<br>(0.16) | 0.69***<br>(0.17) |
| <b>Seneca Faculty of First Business Program (Ref: Accounting &amp; Financial Services)</b> | Human Resources & Leadership         | 0.23***<br>(0.07) | 0.25***<br>(0.09)  | 0.14<br>(0.13)    | 0.29**<br>(0.14)  |
|  | International Business & Management  | -0.15**<br>(0.06) | -0.08<br>(0.08)    | -0.08<br>(0.09)   | -0.01<br>(0.10)   |
|  | Marketing                            | 0.26***<br>(0.07) | 0.20**<br>(0.10)   | 0.33***<br>(0.10) | 0.29**<br>(0.14)  |
|  | Hospitality & Tourism                | 0.43***<br>(0.10) | 0.43***<br>(0.12)  | 0.47***<br>(0.12) | 0.56***<br>(0.18) |
|  | Public Admin/Gov't Relations         | 0.46***<br>(0.09) | 0.65***<br>(0.12)  |                   |                   |
|  | Arts, Technology, Science Management | 0.23<br>(0.13)    | 0.27<br>(0.18)     | 0.13<br>(0.24)    |                   |
| <b>First Business Credential at Seneca (Ref: 2-Year Diploma)</b>                           | 3-Year Diploma                       | -0.02<br>(0.06)   |                    |                   |                   |
|  | Bachelor's Degree                    | 0.07<br>(0.08)    |                    | ---               | ---               |
|  | Grad Certificate                     | 0.24***<br>(0.08) |                    | ---               | ---               |
| <b>University Cumulative GPA Before Transfer (Ref: D)</b>                                  | C                                    | 0.80***<br>(0.06) | 0.78***<br>(0.08)  | 0.69***<br>(0.09) | 0.66***<br>(0.11) |
|  | B                                    | 1.02***<br>(0.07) | 0.71***<br>(0.11)  | 0.84***<br>(0.14) | 0.75***<br>(0.20) |
|  | A                                    | 1.14***<br>(0.19) | 0.78**<br>(0.35)   | 1.30<br>(0.93)    | 1.49<br>(0.98)    |
| <b>DA Income Group (Ref: Low Income)</b>   | Mid Income                           | ---               | 0.21***<br>(0.08)  | ---               | ---               |
|  | High Income                          | ---               | 0.07<br>(0.07)     | ---               | ---               |
| <b>HS Grade 11 to OAC GPA (Ref: &lt;69%)</b>   | 70-79%                               | ---               | 0.10<br>(0.08)     | ---               | ---               |
|  | ≥80%                                 | ---               | 0.47***<br>(0.11)  | ---               | ---               |
| <b>Number of HS Grade 11/12 Courses a Student Failed (Ref: 0)</b>                          | 1-2                                  | ---               | -0.12<br>(0.07)    | ---               | ---               |
|  | ≥3                                   | ---               | -0.29***<br>(0.10) | ---               | ---               |
| <b>Student Eligible for University (Ref: No)</b>   | Yes                                  | ---               | 0.18**<br>(0.08)   | ---               | ---               |
| <b>One Parent Has a Degree (Ref: No)</b>   | Yes                                  | ---               | ---                | 0.15**<br>(0.07)  | 0.20***<br>(0.08) |
| <b>English Comprehension Assessment Score</b>  | 120 Point Scale                      | ---               | ---                | 0.01***<br>(0.00) | 0.01***<br>(0.00) |
| <b>Math Assessment Score</b>   | 120 Point Scale                      | ---               | ---                | ---               | 0.01***<br>(0.00) |
| <b>Constant</b>  | Constant                             | 2.25***<br>(0.07) | 1.57***<br>(0.24)  | 1.64***<br>(0.14) | 1.25***<br>(0.20) |

| VARIABLES    | VARIABLES    | Model 1 | Model 2 | Model 3 | Model 4 |
|--------------|--------------|---------|---------|---------|---------|
| Observations | Observations | 1,591   | 854     | 757     | 594     |
| R-squared    | R-squared    | 0.41    | 0.39    | 0.25    | 0.20    |

*Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca graduate certificate or degree programs were excluded. (6) Students entering Seneca’s one-year certificate programs were excluded due to small sample size. (7) Variables investigated but not selected and not presented in above table: year of entry to Seneca business program, last program at university before transfer, “>50% senior high school courses U/M/OAC level,” student’s first language, plans for university, and last school attended.*

The models investigating the odds of students graduating within the standard program length at Seneca (Table 37) found only one socio-demographic variable associated with graduation: gender. When controlling for all variables of interest, female students compared to male students had higher odds of graduating on time.

High school grades were positively associated with graduating on time, as were having a higher university cumulative GPA and a higher math assessment score upon Seneca entry. As seen with grades, whether a student graduated from university before transfer had no impact on Seneca retention.

The business faculty that the student entered was not significantly associated their odds of graduating within the standard program length; however, university transfer students who entered graduate certificate programs were more likely to graduate on time compared to university transfer students who entered two-year diploma programs.

Students who reported having plans for university at college entry, despite having previously attended university, were less likely to graduate from Seneca within their program’s standard length compared to students who did not aspire at college entry to return to university following their program at Seneca.

Table 37. Regression results: Odds of graduating on time at Seneca for students transferring from York/Ryerson

| VARIABLES  | VARIABLES            | Model 1           | Model 2           | Model 3           | Model 4           |
|--|----------------------|-------------------|-------------------|-------------------|-------------------|
| <b>University Transferred From (Ref: York)</b>                   | Ryerson              | 1.05<br>(0.15)    | 0.82<br>(0.15)    | 0.97<br>(0.18)    | 0.99<br>(0.21)    |
| <b>Gender (Ref: Female)</b>                                      | Male                 | 0.69***<br>(0.09) | 0.62***<br>(0.11) | 0.64***<br>(0.10) | 0.57***<br>(0.11) |
| <b>Used DCTO? (Ref: No)</b>                                      | Yes                  | 3.14***<br>(1.05) | 3.28***<br>(1.35) | 4.61***<br>(1.76) | 4.90***<br>(1.90) |
| <b>First Business Credential at Seneca (Ref: 2-Year Diploma)</b> | 3-Year Diploma       | 0.76<br>(0.13)    | 0.87<br>(0.19)    |                   |                   |
|  | Bachelor's Degree    | 0.86<br>(0.19)    | 0.90<br>(0.24)    | ---               | ---               |
|  | Grad Certificate     | 3.45***<br>(0.65) | 4.20***<br>(1.16) | ---               | ---               |
| <b>University Cumulative GPA Before Transfer (Ref: D)</b>        | C                    | 2.62***<br>(0.44) | 3.25***<br>(0.72) | 2.54***<br>(0.52) | 2.63***<br>(0.67) |
|  | B (Model 1)          | 3.05***<br>(0.65) | 2.47***<br>(0.77) | 2.82***<br>(0.88) | 2.22<br>(0.97)    |
|  | A & B (Models 2,3,4) |                   |                   |                   |                   |
|  | A                    | 2.09<br>(1.16)    |                   |                   |                   |
| <b>HS Grades 11 to OAC GPA</b>                                   | 100% Scale           | ---               | 1.04**<br>(0.02)  | ---               | ---               |
| <b>Plans for University (Ref: No)</b>                            | Yes                  | ---               | ---               | 0.58***<br>(0.11) | 0.61**<br>(0.13)  |
| <b>Math Assessment Score</b>                                     | 120 Point Scale      | ---               | ---               | ---               | 1.01**<br>(0.00)  |
| <b>Constant</b>  |                      | 0.36***<br>(0.06) | 0.02***<br>(0.02) | 0.82<br>(0.12)    | 0.45**<br>(0.14)  |
| <b>R-squared</b>   |                      | 0.1718            | 0.1951            | 0.0717            | 0.0801            |
| <b>Observations</b>  | Observations         | 1,413             | 776               | 681               | 520               |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca graduate certificate or degree programs were excluded. (6) Variables investigated but not selected and not presented in above table: start age in Seneca business program, citizenship, Seneca faculty of first business program, university graduate before transfer to Seneca, year of entry to Seneca's business program, last program at university before transfer to Seneca, DA income group, >50% senior high school courses U/M/OAC level, number of Grade 11/12 courses a student failed, eligible for university, first language, last school attended a university, one parent has a degree, and English comprehension assessment score.

## SUCCESS OF SENECA TRANSFER STUDENTS AT UNIVERSITY

The final analysis investigated factors influencing success of transfer students from Seneca's business programs at York or Ryerson. Table 38 presents the results from logistic regression models that investigated factors potentially associated with achieving an average of B or above at York or Ryerson.

When not controlling for high school background or skills assessment (Model 1 only), students transferring from Seneca to Ryerson were more likely to obtain an average of B or above compared to those who transferred to York.

Gender and age were only significantly associated with the odds of obtaining a B average or above in Model 2, which adjusted for high school variables (international students were excluded), with males and older students outperforming females and younger students, respectively. The likelihood of achieving an average of B or above at university following transfer from Seneca was associated primarily with academic background including math assessment scores and Seneca GPA (pre-transfer), both of which were strongly associated with university GPA across all models.

In Models 3 and 4, which excluded students in degree and graduate certificate programs but included skill assessments and survey results, achieving a B average or above at university was significantly associated with pre-transfer grades and the amount of transfer credit received. Interestingly, Seneca transfer students with no record of transfer credit upon university entry were more likely to obtain a B average or above post-transfer compared to those who received one to three semesters of transfer credit. Moreover, there was no observed association between obtaining three or more semesters of transfer credit versus none at all. Unlike in the descriptive results, graduating before transfer was not associated with the odds of achieving a B average or better at university.

Table 38: Regression results: Odds of achieving a B average or above at university for students transferring from Seneca to York/Ryerson

| VARIABLES   | VARIABLES         | Model 1 | Model 2 | Model 3 | Model 4 |
|---|-------------------|---------|---------|---------|---------|
| <b>University Transferred To<br/>(Ref: York)</b>                                      | Ryerson           | 1.41**  | 1.05    | 0.98    | 0.95    |
|   |                   | (0.19)  | (0.24)  | (0.26)  | (0.30)  |
| <b>Gender<br/>(Ref: Female)</b>   | Male              |         | 1.54**  |         |         |
|   |                   |         | (0.27)  |         |         |
| <b>Start Age in Business<br/>Program at Seneca</b>                                    | 1-Year Increments |         | 1.05*** |         |         |
|   |                   |         | (0.02)  |         |         |
| <b>Citizenship Status<br/>(Ref: Canadian Citizen)</b>                                 | International     |         | ---     | 1.59    |         |
|   |                   |         |         | (0.38)  |         |
|   | Domestic - Other  |         |         | 0.79    |         |
|   |                   |         |         | (0.19)  |         |
| <b>Seneca GPA, All Courses<br/>Ever Attempted on 4-pt<br/>Scale<br/>(Ref: 3.75-4)</b> | 3-3.75            | 0.24*** | 0.17*** | 0.15*** | 0.15*** |
|   |                   | (0.06)  | (0.05)  | (0.05)  | (0.06)  |
|   | 2-3               | 0.10*** | 0.08*** | 0.08*** | 0.08*** |
|   |                   | (0.03)  | (0.03)  | (0.03)  | (0.03)  |
|   | <2                | 0.06*** | 0.04*** | 0.04*** | 0.05*** |
|   |                   | (0.02)  | (0.02)  | (0.02)  | (0.02)  |
| <b>Transfer Credits Awarded at<br/>University<br/>(Ref: None or Missing)</b>          | 1 Semester        |         | 0.92    | 0.39**  | 0.42    |
|   |                   |         | (0.32)  | (0.18)  | (0.21)  |
|   | 1-2 Semesters     |         | 1.05    | 0.51    | 0.38**  |
|   |                   |         | (0.32)  | (0.19)  | (0.16)  |

| VARIABLES  | VARIABLES       | Model 1           | Model 2          | Model 3           | Model 4           |
|--|-----------------|-------------------|------------------|-------------------|-------------------|
|  | 2-3 Semesters   |                   | 0.78<br>(0.25)   | 0.44**<br>(0.16)  | 0.36**<br>(0.15)  |
|  | 3+ Semesters    |                   | 1.96**<br>(0.62) | 0.96<br>(0.37)    | 0.92<br>(0.42)    |
| <b>Last School Attended – University (Ref: No)</b> | Yes             | ---               | ---              |                   | 0.58**<br>(0.16)  |
| <b>Average Math Assessment Score</b>               | 120 Point Scale | ---               | ---              | ---               | 1.02***<br>(0.00) |
| <b>Constant</b>                                    |                 | 3.46***<br>(0.75) | 1.07<br>(0.64)   | 8.36***<br>(3.85) | 2.86<br>(1.73)    |
| <b>R-squared</b>                                   |                 | 0.1002            | 0.1459           | 0.1254            | 0.1552            |
| <b>Observations</b>                                |                 | 1,074             | 740              | 626               | 547               |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca graduate certificate or degree programs were excluded. (6) Variables investigated but not selected and not presented in above table: student used the DCTO, Seneca faculty of first business program, credential of last program at Seneca, year of entry to Seneca’s business program, graduate from Seneca, program of entry at university, DA income group, >50% senior high school courses U/M/OAC level, high school Grade 11 to OAC GPA, number of Grade 11/12 courses a student failed, eligible for university, first language, plans for university, one parent has a degree, and English comprehension assessment score.

Table 39 presents the results from logistic regression models that investigated the factors associated with a student’s odds of retention or graduation from York or Ryerson one year following transfer from Seneca. Across all models, the university to which a Seneca student transferred was not found to be associated with the student’s odds of retention one year following transfer. In Model 1, international students compared to domestic students, and male transfers compared to female transfers, had higher odds of retention after the first year of university; however, those effects disappeared in Models 3 and 4, which include other survey and skills assessment variables. In Models 1 and 2, male transfers compared to female transfers had higher odds of retention after the first year of university, an effect not seen in the models containing assessment and survey variables (Models 3 and 4).

The effect of pre-transfer GPA was only significant in Model 1, which does not contain high school or assessment scores, and in the high school model (Model 2), which excludes international students. In the models containing assessment scores (Models 3 and 4), the only significant explanatory factor was math assessment skills at Seneca entry (Model 4). Any transfer credit provided by the university (or on record) had a positive effect on first-year retention in Models 1 and 2.

Table 39. Regression results: Odds of first-year retention at university for students transferring from Seneca to York/Ryerson

| VARIABLES  | VARIABLES   | Model 1           | Model 2           | Model 3        | Model 4           |
|--|---|-------------------|-------------------|----------------|-------------------|
| <b>University Transferred to (Ref: York)</b>   | Ryerson   | 0.85<br>(0.25)    | 1.12<br>(0.25)    | 1.16<br>(0.31) | 1.27<br>(0.36)    |
| <b>Gender (Ref: Female)</b>  | Male  | 1.51**<br>(0.31)  | 1.89***<br>(0.42) | 1.68<br>(0.45) |                   |
| <b>Start Age in First Business Program at Seneca (Ref: &lt;19)</b>                         | 19-20   |                   |                   |                | 0.46**<br>(0.17)  |
|  | 21-22   |                   |                   |                | 0.43<br>(0.19)    |
|  | 23-24   |                   |                   |                | 0.17***<br>(0.10) |
|  | 25+   |                   |                   |                | 0.45<br>(0.22)    |
| <b>Citizenship Status (Ref: Canadian Citizen)</b>  | International   | 2.51***<br>(0.69) | ---               |                |                   |
|  | Domestic – Other                                      | 1.08<br>(0.28)    |                   |                |                   |
| <b>Seneca Faculty of First Business Program (Ref: Accounting &amp; Financial Services)</b> | Human Resources & Leadership                          | 1.66<br>(0.75)    |                   |                | 2.71<br>(1.47)    |
|  | International Business & Management                   | 1.16<br>(0.26)    |                   |                | 1.83<br>(0.59)    |
|  | Marketing   | 2.33**<br>(0.94)  |                   |                | 3.39**<br>(1.92)  |
|  | Hospitality & Tourism                                 | 0.42<br>(0.19)    |                   |                | ---               |
|  | Arts, Technology, Science Mgt, Public Admin/Gov’t Rel | 0.60<br>(0.34)    |                   |                | ---               |
| <b>Seneca GPA, All Courses Ever Attempted on 4pt Scale (Ref: 3.75-4)</b>                   | 3-3.75  | 0.44<br>(0.19)    | 0.51<br>(0.23)    |                |                   |
|  | 2-3   | 0.26***<br>(0.11) | 0.28***<br>(0.13) |                |                   |
|  | <2  | 0.20***<br>(0.10) | 0.19***<br>(0.10) |                |                   |
| <b>Graduate from Seneca Before Transfer? (Ref: No)</b>                                     | Yes   | 0.56**<br>(0.16)  |                   |                |                   |
| <b>Transfer Credits Awarded at University (Ref: 0 &amp; Missing)</b>                       | 1 Semester  | 2.33**<br>(0.92)  | 3.25***<br>(1.47) |                |                   |
|  | 1-2 Semesters   | 2.38***<br>(0.72) | 1.81<br>(0.61)    |                |                   |
|  | 2-3 Semesters   | 2.84***<br>(1.02) | 2.88***<br>(1.11) |                |                   |
|  | 3+ Semesters  | 3.21***<br>(1.21) | 2.80***<br>(1.06) |                |                   |
| <b>Average Math Assessment Score</b>   | 120 Point Scale                                       | ---               | ---               | ---            | 1.02***<br>(0.01) |
| <b>Constant</b>  |   | 7.98***           | 8.55***           | 4.52***        | 1.67              |

| VARIABLES           | VARIABLES | Model 1 | Model 2 | Model 3 | Model 4 |
|---------------------|-----------|---------|---------|---------|---------|
|                     |           | (3.84)  | (3.80)  | (0.95)  | (0.88)  |
| <b>R-squared</b>    |           | 0.0643  | 0.0404  | 0.0111  | 0.0641  |
| <b>Observations</b> |           | 889     | 622     | 475     | 473     |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (3) Empty cells indicate dropped variables due to insignificance, whereas “---” indicates the variable was not included in the specific model. (4) For Model 2, with high school variables, international students were excluded. (5) For Models 3 and 4, including BDAT responses and assessment scores, students entering Seneca graduate certificate or degree programs were excluded. (6) Variables investigated but not selected and not presented in above table: student used the DCTO, credential of last program at Seneca, year of entry to Seneca’s business program, program of entry at university, DA income group, >50% senior high school courses U/M/OAC level, high school Grade 11 to OAC GPA, number of Grade 11/12 courses a student failed, eligible for university, first language, plans for university, last school attended – university, one parent has a degree, and English comprehension assessment score.

The outcome of whether a student graduated from university within two years of transfer was also investigated (Table 40). Due to a small sample size, only the model that excludes high school grades, survey variables and assessment scores was conducted (model 1). Only two factors were associated with higher odds of graduation at the two-year point: Seneca GPA pre-transfer and, as expected, transfer credit awarded upon university entry.

Table 40. Regression results: Odds of graduation within two years after transfer to university for students transferring from Seneca to York/Ryerson

| VARIABLES  | VARIABLES  | Model 1           |
|--|--|-------------------|
| <b>Seneca GPA, All Courses Ever Attempted on 4pt Scale (Ref: 3.75-4)</b> | 3-3.75   | 0.45***<br>(0.11) |
|  | 2-3  | 0.44***<br>(0.12) |
|  | <2   | 0.25***           |
|  | <b>Transfer Credits Awarded at University (Ref: 0 &amp; Missing)</b> | 1 Semester        |
|  | 1-2 Semesters  | 1.78<br>(0.62)    |
|  | 2-3 Semesters  | 1.41<br>(0.57)    |
|  | 3+ Semesters   | 9.03***<br>(3.70) |
| <b>Constant</b>  | Constant   | 0.24***<br>(0.08) |
| <b>R-squared</b>   |  | 0.1211            |
| <b>Observations</b>  | Observations   | 889               |

Notes: (1) Standard errors in parentheses. (2) \*\*\* $p < 0.01$ , \*\* $p < 0.05$ . (2) Variables investigated but not selected and not presented in above table: gender, student’s start age in first business program at Seneca, citizenship, student used the DCTO, Seneca faculty of last business program, credential of last program at Seneca, graduate from Seneca, and program of entry at university.

## Discussion and Conclusion

This study found that 11% of all Seneca students who enrolled in a business program between 2012 and 2017 had enrolled at York or Ryerson at some point between 2007 and 2018, either before or after their Seneca studies. The vast majority of students entering a Seneca business program from York or Ryerson had not completed their credential prior to college entry (68%), whereas the reverse was the case for students continuing on to York or Ryerson after Seneca, with 78% graduating from Seneca before transfer.

Most university graduates entered a Seneca graduate certificate program (87%), whereas those who left university without a degree entered a range of credentials at Seneca, with 18% entering a college degree program. An overwhelming share of Seneca students continuing on to York or Ryerson entered business or related programs (82% and 95%, respectively), whereas university students entering Seneca originated in a variety of programs.

Among the students who transferred from York or Ryerson to a Seneca business program, 82% had either graduated or were still enrolled in Seneca within one year, and 77% after two years. Overall, 49% graduated from Seneca within two years. In terms of grades, 56% obtained an average of B or above at Seneca. University graduates outperformed non-graduates at Seneca academically, mainly as a result of stronger high school and university grades.

For Seneca business students continuing on to York or Ryerson, 85% were retained after one year, and 74% after two years, with 27% graduating within two years of transfer. With regard to grades, 44% of Seneca students who transferred to York or Ryerson obtained an average of B or above.

Academic background was the most significant factor in student success following transfer. A student's GPA prior to transfer, regardless of pathway (university-to-college or college-to-university), was consistently associated with their GPA, retention, and odds of graduating following transfer. Seneca students who were stronger academically than their peers were more likely to transfer to either York or Ryerson. Students who performed well at university following transfer from Seneca had also performed well at Seneca and prior to Seneca entry. They had taken university preparatory courses at the high school level, obtained good grades at high school, and had performed well on assessment testing at Seneca entry (particularly in math). However, following their transfer to university, their high school background was not a factor in their success, whereas their entering math skills and Seneca grades were. However, for both the entire Seneca business population under study and students transferring from York or Ryerson, high school background was a factor in their academic success at Seneca.

Grades before transfer and math skills upon Seneca entry were the only consistent influencers on all the outcomes studied. The consistency of math proficiency as a significant factor across all of the models is very interesting, and a potentially important area of future research as this finding may be an indication of how important fundamental math skills are in post-secondary business programs. Interestingly, reading comprehension was only significantly associated with academic outcomes at Seneca, both in the full population and for students transferring from university, but was not significantly associated with academic performance at university for students who transferred from Seneca.

Previous work has shown the impact of graduating before transfer on most transfer outcomes, independent of grades. In the study's descriptive analysis, students who graduated from their Seneca program prior to transfer to university often performed better after

transfer than students who did not graduate from their Seneca program prior to transfer. This effect was even stronger for students transferring from York or Ryerson to Seneca. Students who graduated from their university program prior to transferring to Seneca continued to do well at college, with the majority entering graduate certificate programs. However, those students who did not graduate from their university program prior to transferring to Seneca were often those who did poorly at the university level, and continued to struggle in their Seneca program following transfer. Some students who did poorly academically in university may have considered college as a pathway back to university following the completion of a credential or improvement of their grades at college. A large share of students who transferred from York and Ryerson (26% and 37%, respectively) indicated on the Seneca entering student survey that they aspired to attend university following completion of their Seneca program.

When investigating student socio-demographic characteristics, the study observed that students who transferred from Seneca's business programs to university were more likely to be younger and male, and less likely to be international students or to speak English as a first language. Parents' education and neighbourhood income had no effect on college-to-university transfer. In terms of retention and grades at Seneca, males consistently underperformed females, both within the full Seneca population and students who transferred to Seneca from York or Ryerson. In contrast, within the population that transferred to university males outperformed females for both GPA and first year retention at university in some investigated models.

Canadian citizens obtained lower grades and were less likely to graduate compared to non-Canadian citizens within the full Seneca business population. However, citizenship was not significantly associated with academic outcomes following transfer regardless of transfer direction. Within the full Seneca business population, students reporting English as a first language were less likely to transfer, more likely to obtain lower grades, and less likely to graduate. However, within investigated models, a student's first language was not observed to be associated with the outcomes of interest.

Socio-economic status (measured in this study as a student's neighbourhood income and parental education) has been an area of interest for research on student access to post-secondary education, academic success, and transfer from college to university. In the current study, however, these factors were found to have limited significance. Neighbourhood income was positively associated with grades in the full Seneca population, whereas having a parent with a degree was associated with higher grades at Seneca for the university population that transferred.

One, perhaps puzzling, finding from this study is that socio-demographic factors have a significant effect on academic outcomes within the full Seneca population, but this effect does not often hold within the transfer population. We suggest that socio-demographic characteristics of interest (such as gender, age, status in Canada, first language) may affect a student's pre-transfer GPA and academic success, which then indirectly influences the student's post-transfer academic success. Therefore, these socio-demographic factors should continue to be considered in any research studies or evaluations of transfer students and pathways.

As seen in a previous review of Seneca's degree and credit transfer office (McCloy, Baker, Williams, et al., 2018), students who received transfer advising were far more likely to both transfer to university and outperform other students academically at Seneca. In contrast, the current study demonstrates that once a student has transferred to York or Ryerson, DCTO

advising has no impact on their academic performance after transfer. This is to be expected – the DCTO's mandate is to inform students about various pathways for university and college admission, not necessarily to prepare them for post-transfer academic success. However, as this study only included academic outcomes, there may be other outcomes related to the impact of the DCTO and the transfer experience that were not measured here.

*Pathways of Interest:* An additional focus of this research was to investigate specific pathways of interest between Seneca, York and Ryerson. Pathways of interest for students entering Seneca included a business degree or graduate certificate. The study found that students entering a degree program at Seneca had previously struggled in university and appeared to be using Seneca's degree programs as a "second chance" at acquiring a degree. After transfer, these students were observed to obtain a slightly higher GPA than in university, however they continued to underperform compared to the non-transfer Seneca population.<sup>11</sup> In contrast, students entering business graduate certificates had good grades at university and did very well at Seneca in terms of graduation rates and grades.

For the college students continuing on to Ryerson or York, the study analyzed students transferring within established business pathways from Seneca business diplomas to commerce degrees at university. Overall, these longstanding pathways appear to be functioning well. The Seneca to Ryerson business pathway focuses mostly on graduates of three-year business diplomas who can primarily enter the third year of one of several business management majors or enter a stand-alone two-year degree completion program in business technology management. Despite taking, on average, a reduced course load at Ryerson, 43% obtained a Ryerson degree within two years, and 73% had a degree within three years of entering.

Pathways to York's commerce degree programs attract more graduates of two-year diploma programs. Overall, 24% of two-year business graduates completed a commerce degree in two years, and 40% within three years. For three-year diploma graduates, 29% completed within two years, and 35% within three years. Seneca transfers to York were also taking, on average, a reduced course load post-transfer. Regression models which were conducted using the whole population of students who transferred to university, irrespective of pathway, demonstrated that a student's ability to graduate from Ryerson or York within two years of transfer was strongly associated with two factors: (1) the amount of credit or advanced standing received following transfer and (2) Seneca grades pre-transfer. There was no institutional effect, an indication that the transfer policy was the key determinant of students graduating within two years after transfer.

Overall, the results of this research help to highlight the transfer student profile and the factors that influence successful transfer between Ontario post-secondary institutions. Additionally, these results may help to inform current and future transfer agreements among Ontario post-secondary institutions.

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<sup>11</sup> Two ongoing ONCAT-funded studies will provide a fuller picture of these students through the use of: (1) administrative data from five of Ontario's degree-granting colleges, to compare outcomes by transfer pathway to the degrees, and (2) a survey of students transferring between York and Seneca, linked with their academic data, that asks students to indicate their motivations for choosing their pathways.

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## APPENDIX A: PROGRAM AND FACULTY GROUPINGS

Table A 1. SPEMAJ groupings for university programs

| <b>SPEMAJ Category</b>                         | <b>SPEMAJ Codes</b> |  |
|--|---------------------|--|
| <b>Business, Economics and Commerce</b>        | 41200               | Commerce/Business/Administration                                   |
|  | 414**               | Specialized Administration   |
|  | 42700               | Economics  |
| <b>Natural and Applied Sciences</b>            | 5****               | Agriculture and Biological Sciences (excluding Health Professions) |
|  | 6****               | Engineering and Applied Sciences                                   |
|  | 7****               | Health Professions and Occupations                                 |
|  | 8****               | Mathematics and Physical Sciences                                  |
| <b>Social Sciences, Humanities &amp; Other</b> | 1****               | Education, Physical Education, Recreation and Leisure              |
|  | 2****               | Fine and Applied Arts  |
|  | 3****               | Humanities and Related   |
|  | 4****               | Social Sciences and Related (exclude Business 412/414)             |
|  | 9****               | Other  |

Table A 2. Seneca Business faculty groupings

| <b>Seneca Business Faculty Groupings</b>          | <b>Seneca Business Faculty</b>   |
|---|--|
| <b>Human Resources and Leadership</b>             | Centre for Human Resources<br>School of Leadership and Human Resources                                       |
| <b>Accounting and Financial Services</b>          | School of Accounting and Financial Services  |
| <b>International Business and Management</b>      | School of International Business and Management  |
| <b>Marketing</b>                                  | School of Marketing  |
| <b>Hospitality and Tourism</b>                    | School of Hospitality and Tourism  |
| <b>Public Administration/Government Relations</b> | School of Legal and Public Administration<br>School of Media   |
| <b>Arts, Technology and Science Management</b>    | Centre for the Built Environment<br>School of Fashion<br>School of Information and Communications Technology |

Table A 3. Seneca programs by Business faculty

| <b>Seneca Business Faculty</b>                            | <b>Seneca Program Name</b>                                     |
|---|--|
| <b>Centre for Human Resources</b>                         | Bachelor of Commerce (Human Resources Strategy and Technology) |
|   | Business Administration - Human Resources                      |
| <b>Centre for the Built Environment</b>                   | Project Management – Environmental                             |
| <b>School of Accounting and Financial Services</b>        | Accounting   |
|   | Accounting And Finance   |
|   | Accounting And Payroll   |
|   | Accounting Techniques  |
|   | Bachelor of Commerce (Financial Services Management)           |
|   | Bachelor of Commerce (International Accounting and Finance)    |
|   | Business - Insurance   |
|   | Business Administration - Financial Planning                   |
| Business Administration – Accounting & Financial Planning |  |

| <b>Seneca Business Faculty</b>                             | <b>Seneca Program Name</b>  |
|--|---|
|  | Financial Services - Client Services<br>Financial Services Compliance Administration<br>Financial Services Practitioner<br>Fraud Examination And Forensic Accounting<br>Professional Accounting Practice  |
| <b>School of Fashion</b>                                   | Event Management - Event And Exhibit Design<br>Fashion Business<br>Retail Management - Fashion Merchandising  |
| <b>School of Hospitality and Tourism</b>                   | Global Hospitality Business Development<br>Global Hospitality Operations Management<br>Hospitality Management - Hotel and Restaurant<br>Tourism - Travel Operations<br>Tourism and Travel   |
| <b>School of Information and Communications Technology</b> | Project Management - Information Technology   |
| <b>School of International Business &amp; Management</b>   | Bachelor of Commerce (Business Management)<br>Bachelor of Commerce (International Business Management)<br>Business<br>Business Administration - Entrepreneurship and Small Business<br>Business Administration - Management<br>Business Administration - Purchasing and Supply Management<br>Global Logistics And Supply Chain Management<br>International Business<br>International Business Administration<br>International Business Management<br>International Transportation And Customs |
| <b>School of Leadership &amp; Human Resources</b>          | Green Business Management<br>Human Resources Management<br>Non-profit Leadership and Management   |
| <b>School of Legal and Public Administration</b>           | Public Administration   |
| <b>School of Marketing</b>                                 | Brand Management<br>Business - Marketing<br>Business Administration - Marketing<br>Creative Advertising<br>Event Marketing - Sports, Entertainment, Arts<br>Honours Bachelor of Commerce - Marketing<br>Marketing Management<br>Sales Force Automation and CRM Analytics<br>Strategic Marketing and Marketing Analytics   |
| <b>School of Media</b>                                     | Corporate Communications<br>Government Relations  |

## APPENDIX B. REGRESSION MODEL-BUILDING

For each multivariable regression model, purposeful selection<sup>12</sup> was used to select potential confounding variables for inclusion in each analysis. For each independent variable, the unadjusted association with the dependent variable was estimated and those with a p-value  $\leq 0.25$  were selected for inclusion in the multivariable model. Variables of interest were assessed independently by removing each variable from the multivariable model one at a time. If the independent variables of interest or the corresponding standard errors changed by greater than or equal to 10% upon removal of a variable, the variable was included in the model. The likelihood-ratio (LR) test was used to assess whether inclusion of the variable significantly improved model fit. A variable was kept in the multivariable model if its inclusion statistically improved the fit of the model as determined by a LR test p-value of  $< 0.05$ . Variables for students' gender and age were included in all regression models regardless of their statistical significance. Collinearity among independent variables of interest was inspected with cross-tabulation and the Pearson correlation coefficient. Variables that were highly correlated (with Pearson correlation coefficients  $\geq 0.7$ ) were further examined to determine which set of variables would be included in the final model.<sup>13</sup>

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<sup>12</sup> As proposed by Hosmer and Lemeshow. See: D.W. Hosmer & S. Lemeshow (2000), *Applied logistic regression*. New York: Wiley.

<sup>13</sup> See: E. Vittinghoff (2012), *Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models*. 2nd ed. New York: Springer.

## APPENDIX C: READING AND MATH ASSESSMENT SCORES

Table C 1. Reading comprehension scores upon Seneca entry by status in Canada and transfer pathway (mean scores, /120)

|                                  | International | Canadian Citizen | Domestic - Other | Total |
|----------------------------------|---------------|------------------|------------------|-------|
| <b>York Before Seneca</b>        | 57.2          | 80.3             | 66.3             | 75.9  |
| <b>Seneca Before York</b>        | 56.0          | 72.4             | 64.0             | 65.2  |
| <b>Ryerson Before Seneca</b>     | 61.5          | 77.8             | 65.5             | 76.0  |
| <b>Seneca Before Ryerson</b>     | 65.3          | 78.1             | 71.4             | 76.0  |
| <b>University Before College</b> | 57.9          | 79.5             | 66.1             | 75.9  |
| <b>College Before University</b> | 57.2          | 75.5             | 66.9             | 69.6  |
| <b>Seneca Non-Transfers</b>      | 57.9          | 71.0             | 60.1             | 65.5  |
| <b>Total Population</b>          | 57.8          | 71.9             | 60.7             | 66.3  |

Table C 2. Algebra and arithmetic assessment results by transfer pathway, (mean scores, /120)

|                                  | International | Canadian Citizen | Domestic - Other | Total |
|----------------------------------|---------------|------------------|------------------|-------|
| <b>York Before Seneca</b>        | 96.1          | 73.2             | 101.3            | 79.3  |
| <b>Seneca Before York</b>        | 103.6         | 73.9             | 95.1             | 89.2  |
| <b>Ryerson Before Seneca</b>     | 99.0          | 75.4             | 87.7             | 78.2  |
| <b>Seneca Before Ryerson</b>     | 90.5          | 70.4             | 84.9             | 75.0  |
| <b>University Before College</b> | 96.5          | 73.8             | 97.6             | 79.0  |
| <b>College Before University</b> | 102.2         | 72.1             | 91.1             | 83.9  |
| <b>Seneca Non-Transfers</b>      | 85.2          | 62.3             | 82.9             | 73.3  |
| <b>Total Population</b>          | 86.3          | 63.7             | 83.9             | 74.2  |