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Ontario Student Mobility: Carving paths of desire

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A report to the Ontario Council for Articulation and Transfer

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1 Introduction

The Ontario government has prioritised student pathways within education and between education and the labour market. The Ministry of Training, Colleges and Universities 2015-16 strategic plan notes, for example, "the system will blend academic with applied learning and ensure that transitions are seamless whether it is from high school, between postsecondary education institutions, or between school and work" (Ministry of Training, Colleges and Universities, 2015, p. 3).

The government has spent years investing in research and strategy to achieve these ends. In 2011, the Ontario government set out three goals for a province wide credit transfer system to: "expand and improve pathways to respond to student demand; improve transparency and access to information about pathways and credit transfer; [and,] support student success" (Ministry of Training, Colleges and Universities, 2011). At the same time, the Government established the Ontario Council for Articulation and Transfer (ONCAT), a government agency designed to support credit transfer and mobility of Ontario students. With a five-year mandate to improve student mobility in Ontario's public institutions (ONCAT, 2013) the agency has supported research, partnerships and projects to further the systematic capacity for student choice and opportunity.

Contributing to the four years of substantial research, knowledge building and reflection by ONCAT, this study synthesises current theories and research on student mobility, institutional partnerships and pathways, and presents the current patterns of student flows and institutional agreements in Ontario. The analysis and findings show unexpected routes and relationships, and finds current trends in pathway agreement are not supporting students in the intended way. Based on literature, research and consultations with experts and practitioners, this study derives principles from these findings and develops a framework that supports the effective development and implementation of pathways and supports student movement and articulation between the sectors of postsecondary education (PSE). The intention of the principles and framework is to support strategic decision making that benefits all stakeholders: students, programs, institutions, government, and society at large.

The study is organised in two reports. The first, presented here, presents the theoretical and conceptual frameworks and empirical patterns of student mobility, partnership and pathway agreements in order to uncover what's working and where there is room for improvement. The second, titled Ontario Student Mobility: A framework and decision making tool for building better pathways, presents the practical application of our findings: 'the tool'.

The following report is presented in eight main sections. Following this introduction, Section 2, presents the study's rationale, research questions and research design. Section 3 presents the contextual background for the research and a literature review of student mobility, addressing both system-level and institutional issues. Section 4 deals explicitly with current practice, providing an environmental scan of student mobility, challenges in developing deep and broad pathways for students, and issues of acknowledging students' previous education. Section 5 presents the research methods, while section 6 presents the analysis and findings of four data sources. Section 7 discusses the implications of the research for the development of pathways in Ontario, while Section 8 concludes the research report.

2 Rationale, research design and primary questions

The purpose of this project was to develop a 'decision-making tool' that contains principles to guide decision-making about the development of pathways, articulation, student movement and credit transfer, and a framework to support decision-making. The project outcomes are intended to help jurisdictions, ONCAT, institutions and departments make policies about pathways and decisions about the kinds of pathways that are needed, whether pathways should be linear within fields of education or in related fields, and the level of resources that should be invested in their development. In order to determine what the 'tool' should look like, the team undertook research to determine the features of the transfer and mobility in the Ontario system.

The research examines recent trends in Ontario that relate to student mobility, existing partnerships and pathways agreements, and difficulties that arise in supporting student transfer. The project analysed the considerable literature on the effectiveness of policies and processes in promoting transfer in other jurisdictions (i.e. Anderson, Sun and Alfonso 2006; Gross and Goldhaber 2009; Roksa 2009; Roksa and Keith 2008; Wellman 2002; Welsh and Kjorlien 2001),

Given the amount of time and effort required to develop partnerships and pathways and the different models that are used, the study seeks to understand if and how the pathways and different models of pathways are suitable for certain purposes.

The questions guiding this research are:

1 What are the student mobility patterns of activity in in Ontario? Where do graduates undertake their next credential and in what program areas?
2 What pathways are currently in place at Ontario's colleges and universities? What do they look like and who are they with?
3 What principles and criteria should the jurisdiction, ONCAT, institutions and departments use to make decisions about investing in pathways?

In order to answer these questions the study employed qualitative and quantitative research methods. Described in more detail in Section 5, the project took a multi-level approach to data analysis. The National Graduates Survey (NGS) data was analysed to uncover patterns of student transfer in Ontario, such as whether students in particular fields of study tend to transfer into a different credential in the same field of study or follow alternative paths. A second data source was the Graduate Satisfaction Survey (GSS) of college graduates that captures college graduates who transferred into another program. The ONCAT dataset that holds information on pathways available to students via formal arrangements was examined to see how many, what type, and between what programs/institutions, partnerships arrangements exist. Finally, using Google maps, an analysis of the distance between partner institutions were performed.

Readers should note that because both the NGS and GSS data deal explicitly with students who are graduates of programs, all the analysis deals with graduates who undertake a second credential. While examining students who transfer mid-program is worthy of examination and discussion, it was not possible within the confines of this research.

Respecting that the lived experience is critical to understanding policy, an important component of this work was engaging with experts and practitioners to explore the findings, to enhance the interpretation of the research findings, and to guide our practical policy toolkit. 'Critical Friends' were consulted at various stages of this research. They participated in two semi-structured interviews/consultations on the 'tool' draft, and many participated in a ½ day public symposium. Their contribution has greatly influenced this final report (see Appendix A for the list of Critical Friends).

3 Concepts and practical realities

In this section, the nature of higher education credentialing is addressed. First, the inherent role and purpose of higher education qualifications are explored, noting that qualifications support individuals in gaining access to the labour market and to higher levels of education, and they support social inclusion and social mobility in society. Following that discussion, operational issues that hinder or support mobility are discussed. At the system-level, this includes a review of the traditional roles and goals of the college and university sectors, the role of qualifications profiles, the potential of learning outcomes, and the functional challenges of system level coordination. Institutional and program realities are explored in the third part of this section. Developing effective pathways must take into account the very real issues of economics, competition and status-building that are the lived experience of institutional administrators and decision makers. This leads to the discussion on trust. We have drawn on the interviews we held with critical friends in this section rather than restricting this discussion to the findings section, because they help us to interpret and understand the issues we identified in the literature and how these issues are reflected in Ontario. They also help us to elaborate the challenges and opportunities for building pathways in Ontario and this provides an important context for the whole report.

3.1 Roles and purposes of qualifications

Many governments have set the goal of developing a system that is accessible and equitable, operates efficiently, provides high quality education and is aligned with the economic goals of a jurisdiction (FitzGibbon, 2014; Lennon, 2010b; Wheelahan & Moodie, 2011; Wheelahan, 2016).

The strategies include the development or re-development of education systems that encourage participation, allow students a choice of programs with opportunities for changing direction, and support people returning to formal education to update or enhance their knowledge and skills. Beyond supporting the development of the overall economy, ensuring that members of a society possess certain key skills and capabilities is crucial, both for personal fulfilment and development and to ensure employability and active citizenship. Education needs to result in individuals having knowledge and skills to think critically and creatively and the ability to transfer the knowledge gained in one area to resolve the issues and problems of another area. The goal of these strategies is to develop a workforce that is equipped with the knowledge, skills, capabilities and attributes needed for success in the labour market (Lennon, 2010a).

The role of qualifications, however, is slightly different. A recognised qualification is the passport to and progression in the labour market and further education and is a means social mobility and social inclusion. The next sections unpack these ideas.

3.1.1 Links to the labour market

An important role of qualifications is to prepare graduates for entry to and progression in the work force. Previous work found that students' progression through educational systems is related to fields of educations' links to labour market. Examining student transfer in both Ontario and Australia, Wheelahan (2016) described four types of educational pathways:

- Those with strong links to occupations and strong links between qualifications within the field of education, exemplified by nursing;
- Those with strong links to occupations and weak links between qualifications within the field of education, exemplified by engineering;
- Those with weak links to occupations and strong links between qualifications within the field of education, exemplified by business; and,
- Those with weak links to occupations and weak links between qualifications within the field of education, exemplified by the humanities and sciences.

Further, qualifications that are strongly linked to occupations are mostly regulated, often by a statutory body such as the College of Nurses of Ontario and Professional Engineers Ontario (Wheelahan et al. 2015). Where there is a strong occupational pathway between regulated occupations, there will usually be strong educational pathways. In unregulated occupations the link between qualifications and occupations is usually weak. In these cases, students often need to gain higher level qualifications (such as a degree) to compete in the labour market. This type of student mobility can result in strong pathways between qualifications within fields of education such as from one business qualification to another, or between fields of education such as business and social science. Finally, where fields of education such as the arts and the sciences are weak in colleges, pathways between colleges and universities in these fields are likely to be quite weak (Wheelahan, 2016).

3.1.2 Supporting students and social equity

Governments have linked lifelong learning as a necessary precondition for building a strong knowledge-based society in modern economies. An international environmental scan conducted in 2010 uncovered numerous strategies to encourage participation in post-secondary education and to support students to achieve the higher levels of achievement (Lennon, 2010a). Providing information and support to students and making them aware of opportunities was found to be important in encouraging progression to university education. Particularly, successful examples include mechanisms for offering substantial information and advice to ensure that students are aware of the multiplicity of choices.

Yet, education is not linear for large portions of the population. Individuals' life circumstances and choices do not always allow for uni-directional movement through education. People enter, drop out, change programs, change fields they are interested in, their intentions when entering the programs vary, and their goals can change (Colleges Ontario, 2009). Hence, ensuring that no qualification is terminal (bar the doctorate) is also critical for encouraging progression.

Getting students in the door of postsecondary education is critical, because while some enter a college program with the knowledge they want to pursue further educational opportunities, many decide to proceed to further education while they are in their program. Table 1 below shows a Colleges Ontario analysis of the 2006-2007 Ontario Graduate Satisfaction Survey that indicates when students made the decision to further their education.

Table 1: College graduates who further their education: Timing of the decision

	Before the college program	At the start of the program	During the program	After the program
College-bound	44%	6%	32%	18%
University-bound	41%	6%	42%	11%

(Colleges Ontario, 2009. p. 2).

The proportion of students who decided to attend university only after they were enrolled in a college program suggests that perhaps students gained confidence in their academic abilities and were encouraged to continue. Kerr et al (2010) found multiple studies that showed that transfer students performed equally well in grade point average (GPA) and course grades as their university-only counterparts. Recent research specifically on social science students shows that college students who transferred into the university program performed as well or better than their peers who entered directly into the university program (LeSage et al., 2014). Trick (2013) found similar evidence where transfer students received similar or better GPAs as direct-entry students across seven jurisdictions.

Despite the academic success of transfer students, there is less consistent evidence that they are likely to graduate. Kerr et al's meta-evaluation finds that, in Ontario, college transfer students are more likely to drop out (2010. pp. 23-24). Trick's international scan found conflicting evidence, where there were lower graduation rates for transfer students in three jurisdictions, but the same or higher rates in five (Trick, 2013). The lower graduation rates can been understood as many transfer students are part-time, and part-time students traditionally have a lower graduation rate. Another possibility offered by Kerr (2010) is that students offered more credit for their previous education maybe more likely to graduate (2010).

3.1.3 Encouraging progression in education

Colleges are gateways to further education and tend to enrol higher numbers of students who are traditionally disadvantaged (Deller & Oldford, 2011; Trick, 2013). Enhancing pathways from colleges to university is seen a way to enhance access to university-level education for underrepresented groups such as low-income, remote or rural learners, adult and aboriginal students, as well as those who may not qualify to attend due to weak academic history (Kerr et al., 2010; Lennon, Zhao, & Gluszynski, 2011). This supports both occupational progression and social mobility by providing access to higher levels of education and higher income jobs (Wheelahan, 2009).

However, the social mobility role of student transfer may be limited. Some research has found that in Ontario and Australia elite universities and programs such as law and medicine admit few transfer students (Heath, 2012b; Wheelahan, 2009). Furthermore, one study found that the demographic characteristics of students who transfer from college to university tend to be close to that of university students in Australian and the UK (Wheelahan, 2009).

3.2 Issues of coordination at the system-level

The preceding discussion has demonstrated how governments are challenged to support the educational goals of citizens and increase the available opportunities. There are significant challenges for systems of higher education to provide opportunities for students in a way that is economically efficient, administratively reasonable, while also maintaining quality. In this section, the role and responsibilities of governments are set out, as are current policies and trends.

What emerges is that a government often has conflicting priorities and/or seeks to reflect different goals of interest groups. As a result, policies can be vague in their stated goals or their underlying purpose or inconsistent with other government policies. For example, section 3.2.3 below contrasts the policy of differentiation with that of credit transfer, indicating that there are complex issues at play which highlight the realities of why there may be push back on what could be considered progressive government policies.

3.2.1 System design

Jurisdictions organise their postsecondary education systems and the pathways between sectors and programs in many different ways.[1] Some systems were intentionally designed to support student transfer. The Californian system, for example, is held up as the pinnacle of a cohesive system of colleges and universities, where there is near seamless transfer between two-year and four-year higher education programmes (Colleges Ontario, 2009). Similarly Alberta, British Columbia and Québec designed their college systems to articulate with their university systems. However, many jurisdictions including Ontario did not design their colleges to transfer students to universities and are retroactively trying to find and institute clear links between sectors of colleges and universities, between institutions and programs.

Transfer rates in Ontario are lower than for national and international counterparts (Kerr et al., 2010). Skolnik (1995) suggests that because the binary-system-model hindered transfer the low numbers of student transfer was perceived as lack of demand. Moodie (2003) suggests that low numbers of transfer students in a highly differentiated system might reflect the system's success in matching students with the appropriate sector which fulfils very distinctive roles.

There are significant challenges when the system develops pathways without the support and oversight of the government. Institutions that admit transfer students may be concerned that any unsuccessful transfer student may reflect on the performance of the receiving institution rather than a shared responsibility of the sending and receiving institution, and sending institutions may be concerned that students who transfer successfully but without graduating will be counted as drop outs. Government pressure to admit transfer students may result in receiving institutions limiting the amount of credit they offer, or argue that a coherent program of studies is interrupted when students don't follow the path determined by the institution (Junor & Usher, 2008).

Nonetheless, if "transfer was not the original intention of Ontario colleges, students themselves, through their actions are steering institutions in that direction" (Decock, 2004. p. 15). There have

[1] David Trick outlines the characteristics of 14 jurisdictions on issues of credit transfer (Trick, 2013)

been numerous calls for governmental support in developing a seamless transfer system over the past three decades (see Kerr et al., 2010), and progress has (arguably) been slow. In 1994, the Ontario Ministry announced its intention to establish a voluntary consortium of colleges and universities that would promote cooperation and would publish a guide for students on credit-transfer arrangements. The College-University Consortium Council (CUCC) was formed in 1996).

Given the difficulties of making changes in transfer arrangements, the Rae Report (2005) argued that the "government's approach in this area must be aggressive to stimulate real progress" (p.42). Indeed, the report goes further, suggesting "If institutions cannot make progress under an umbrella of incentives, government should be prepared to mandate greater co-operation in the best interests of Ontario students" (p. 42). In 2011 CUCC was reformed to become ONCAT. It is a government agency with a five year mandate to improve credit transfer and student mobility in Ontario's public institutions.

3.2.2 Qualification frameworks

The Ontario Ministry of Training, Colleges and Universities developed the Ontario Qualifications Framework (OQF) in 2002. The OQF set out credential-level expectations for all levels of post-secondary education (Ministry of Training, Colleges and Universities, nd), intended to "set the standard for each credential that can be used to assess the quality of particular programmes at that credential level, and […] facilitate international recognition of credentials, credit transfer and graduate mobility' (Hatchette, 2012. p. 90). The notion is that it establishes pathways for students to navigate through the 'jungle' of credentials and supports students in transferring their educational history to another program in a seamless manner so that there is limited repetition, which cost students, institutions and systems unnecessary time and money.

As discussed, Ontario was built explicitly as a binary system where the two sectors were not intended to articulate and college programming was intended to be terminal. Based on historic design and redesigns, the Ontario PSE system has a complex set of parameters that shape the distinct sectors of college and university provision. Aside from different funding models and governance structures, there are separate quality assurance mechanisms in Ontario for public college, public university, and private sectors. Each has its own criteria, frameworks, language, expectations and documentation. In fact, there are seven different sets of binding accountability and quality assurance mechanisms managed by five different bodies (Lennon, 2014).

Aligning the different frameworks is challenging and there is little coordination and limited formal paths of communication between the agencies (though there are informal conversations). These factors confound straightforward understanding and comparison of programming (Lennon et al., 2014; Skolnik, 2016).

One question raised about pathways is about whether or not some programs are providing foundational knowledge – a solid base from which any more advanced program can be pursued (the US model), or if it is providing a technical foundation that can be applied through more specific training. This question is fundamental to the question of compatibility in vocational educational training in college diploma programs and bachelors degrees.

It has been argued that, in Ontario, a degree is not simply a diploma plus two years. The Ontario Tuning project, for example, found that two-year diploma programs may include student learning outcomes that are not necessarily part of a four-year bachelor's degree (Lennon et al., 2014). For example, in the physical sciences, students in the college programs have very strong technical skills in testing, characterization and manufacturing, which are not points of focus for students at the four-year degree level.

Skolnik (2016) examined 11 jurisdictions' quality assurance systems for issues that may impact diversity of programming. His findings indicate that countries are able to maintain diversity between applied and academic programs either by having explicit outcomes for each sector or by having common learning outcomes broad enough to be applied to both applied and academic programs.

However, research on the value of learning outcomes for system design (including issues of credit transfer), has shown the policies are generally ineffective (Allais, 2007; Allais, 2014; Lennon, 2016), suggesting that learning outcomes have a long way to go before actively contributing to credit transfer. Alternatively, learning outcomes may be insufficient on their own to support robust pathways and high levels of student transfer, requiring as well a range of policies and practices that support these outcomes (Wheelahan 2011).

3.2.3 Policy issues and strategic plans

Diversity and differentiation are central debates in Ontario higher education currently. The notion of differentiation has been widely supported by government, the Higher Education Quality Council of Ontario, and institutions themselves. It provides institutions with the opportunity to determine their strategic goals through Strategic Mandate Agreements with the government.

Weingarten and Deller (2010) note that institutions can be differentiated based on: structure such as size (large or small); funding (private or public); legislated mandate (undergraduate only or mixed undergraduate and graduate student bodies); the type of program offered such as research intensive or teaching intensive, technical/design school or comprehensive university; how research, teaching or services are provided by the institution(i.e. on-line or residential); institutional status, prestige or rankings; or, on the basis of differences in the composition of the student populations served (unilingual or bilingual, religious, mature students or direct from high school).

There is a significant amount of literature on the promise and challenges of this model of system design. With the increasing variety of offerings, many scholars have noted that institutional diversity has, in fact, decreased: that there is a process of de-differentiation, or homogenisation, of institutions (Birnbaum, 1983; Neave, 1979; Neave, 2000; Vught, 2009).

Relevant to the current discussion on credit transfer, the 2000 Post-secondary Education Choice and Excellence Act (2000), permitted both colleges and private postsecondary institutions to offer a baccalaureate-level degree. The new degrees were intended to be in applied areas of study to have a "hands-on" component, and lead directly to employment. While initially the college-provided degrees were terminal, they are now considered equal to a university-provided degree and students are entitled to apply to Masters programs.

In a 2011 report, the Ontario-based Higher Education Strategy Associates (HESA) considered the pros and cons of college provided bachelors degree. The report identified the benefits of these degrees as "the ability of such [college] organizations to serve an access agenda, as well as their ability to provide new, more applied (and hence labour market-oriented) options for degrees and, in some cases, lower government educational expenditures" (Higher Education Strategy Associates, 2012. p. 16). Another consideration noted by some of the 'Critical Friends' interviewed for this project is that college degrees were developed in part because college students were having a hard time being admitted to university programming: lacking transfer opportunities, colleges started providing the programming.

Colleges' introduction of baccalaureates also opened the system to wider competition for government funding, research dollars, and of course, students. It expanded the market of educational offerings. However, it is not clear that pathways in colleges will be markedly different from potential pathways between colleges and universities. Some critical friends sought to reconcile colleges offering baccalaureates, in which they compete with universities, with the policy to expand student transfer from colleges to universities, which depends on close cooperation and high levels of trust between colleges and universities. Others thought that there was not necessarily a contradiction between colleges offering degrees in some areas, while cooperating with universities through developing pathways in other areas. Arguably, both outcomes are possible: collaboration may be diminished; but on the other hand, institutional partners could work together even if both were offering qualifications at the same credential level. Policy clarity on how pathways and institutional partnerships relate to the government's aims for differentiation would be helpful, as government's response to this issue will shape institutional behaviour.

3.3 Issues of coordination at the institutional level

To this point, the discussion has been on government policies and actions that shape the higher education landscape and sway institutional behaviour. However, institutions themselves are critical actors, as large organisations that are increasingly (and necessarily) being run in a businesses-like manner (Slaughter & Rhoades, 2004). Hence, there are issues in credit transfer and student mobility that are more grounded in realities of administering large organisations. Understanding the lived experience helps to explain why there may be push back on what could be considered socially progressive policies from the government. The following section discusses practical issues of economics, competition and reputation and highlights the contrast between ideals of seamlessly supporting students compared to the realities of the resource-restricted environment in which institutions operate.

3.3.1 Economics

Critical friends suggested two contradictory economic factors may influence universities' decisions to increase their intakes of transfer students. Most universities' lower level undergraduate courses have high enrolments; bigger class sizes and many have a higher proportion of teaching done by contingent faculty who are less costly than tenured faculty. Accordingly, departments generate surpluses in lower level courses which they may apply, for example, to maintaining options in higher levels which have smaller class sizes or lower teaching loads for faculty: first year students pay for the 4th year students. Many transfer students are

exempted from lower level studies, therefore accepting big numbers of transfer students would reduce the economy of scale for lower level courses and thus the attraction of accepting transfers. The contrary point put by some critical friends is that some upper level courses have smaller numbers of students and are marginally viable. Admitting more transfer students would increase the number of senior students and thus the viability of upper level courses.

Nonetheless, universities admit from 2% to 5% of their commencing undergraduate students from college, yet the Ontario Government administers an enrolment corridor which allows universities to vary their enrolments by 5% without affecting their funding. Arguably, most universities could increase their proportion of transfer students markedly without moving beyond the bounds of their funding corridor.

Another argument that speaks to sustainability is the considerable time and effort put into developing agreements and partnership. Curriculum changes, which occur frequently, require constant upkeep of agreements.

In another example of administrative and economic reality impacting policy goals is the time it takes to recognise credits. The issue of credits will be further discussed in section 4.4, but for the purpose of considering functional economic issues here, determining the amount of credit a student will receive takes a significant amount of time. Because the number of students who apply for transfer is higher than the number of students who accept an offer, rational institutional cost minimization dictates that the administrative burden of assessing credits is done only after the student is enrolled. For the student, however, having advanced knowledge of the value of their credits may influence their decision-making, and therefore change patterns. Waiting until the student is registered is less burdensome on the institution but more burdensome for the student.

Admitting students directly from high school is easier and less labour intensive than admitting transfer students. Progression from high school to university is normalized for which systems have been established, automated and integrated. More students seek admission with the same high school credential so the effort in assessing the high school credential is amortized over many more students. In contrast, transfer students are still exceptional for most universities; systems have yet to be normalized and integrated, and because they have low volume most systems remain largely manual and thus labour intensive. Transfer students present with a considerable diversity of credentials, often from different years. While Ontario college credentials follow the same mandated curriculum, it affords colleges appropriate flexibility in content, presentation and pedagogy, which, however, requires separate assessment for credit.

The default position for all parts of the university tends to be to deal with the main cases first, for example, by admitting students directly from school, and dealing with exceptions such as college transfers second when capacity allows. Some critical friends suggested that these reasons may explain some universities admitting high school students before considering transfer students.

3.3.2 Competition for students

Like much of postsecondary education policy and management, student transfer has very different dynamics outside large population centres such as the Greater Toronto Area and

Ottawa-Gatineau. It was put to us by some critical friends that competition for students is an obstacle to transfer in small population centres. It was suggested that universities which recruited students mainly regionally, or from a smaller catchment area, maximised opportunities for students for direct admission and that there were therefore fewer students who would enrol in college in the hope of transferring to university. It was further suggested that colleges would prefer to retain students until they had completed the college's highest qualification rather than facilitate their transfer to university, which may result in an early transfer student being recorded as a drop out. It was said that such competition for students is likely to intensify with the fall in the number of students over the next decade who are traditional college and university going age.

Other critical friends, including critical friends at regional colleges and universities, put a contrary view to us. These friends informed us that regional universities were keen to enrol students who had proved themselves at college, that generally being smaller and younger, regional universities often had more flexibility to adapt academic and administrative requirements to suit transfer students and that the close interaction between college and university faculty and registrarial staff facilitated by a smaller city encouraged cooperation and coordination in student transfer, as in many other areas of the institutions' activities.

Regional connections are therefore a significant issue in transfer discussions. One possibility discussed later is for regional partners to identify transfer pathways between programs that reflect each partner's distinctive strengths and are complementary rather in direct competition.

Some critical friends suggested that some universities admit a low proportion of transfer students because admitting a high proportion of transfer students may reduce their standing amongst elite students, all of whom enter direct from high school. It is true that some high status universities admit a very low proportion of transfer students. But some high status universities, such as the highly selective campuses of the University of California (2014) system, select around 20% of their undergraduates as transfer students. Another critical friend suggested that admitting many transfer students did not affect the standing of some high status universities permitting access to affiliated colleges, to satellite campuses or as part time students, which preserved the elite status of their mainstream entry.

Some college champions suggest that serving a transfer function lowers their status by reducing them to the status of a 'feeder institution', makes them subservient to receiving institutions and compromises their role in preparing graduates for direct entry to work. Arguably this shifts their original mandate and role in supporting the development of the local labour force.

However, this ignores the high status and independence of institutions that prepare graduates for admission to very selective educational destinations, such as high status schools and in the USA liberal arts colleges such as the Little Ivies and members of the Oberlin Group and the Annapolis Group. These institutions have high standing because of their success in preparing graduates for transfer to selective institutions and programs. Students who proceed to higher education have a different outcome from those who proceed directly to work from graduation. But programs can and should prepare students for both further education and for work since all programs are likely to include students whose primary aim is to prepare for higher education as well as students whose primary aim is to prepare for work, and because many graduates who

enter the workforce directly upon graduation are likely to seek to further their education later in their career (Wheelahan 2016).

3.4 Trust

Trust is one of the most important, yet intangible aspects of credit transfer. Does one program or institution trust that another program or institution has provided good quality education, and that a student coming from the program has the skills to proceed in a new program?

Trust occurs at many levels. For the most part, the system trusts institutions to provide high quality education. The system (largely) self regulates through quality assurance measures. Hence the government trusts that institutions are providing education appropriate for the level of each of their qualifications.

There is reasonable though not complete trust with sectors due to common expectations and processes and shared experiences. Colleges are expected to meet the same program standards and essential employability skills so that there is a common expectation of curriculum content and level at which the student is operating. This supports the transfer of students between colleges when this is sought. The university sector has traditionally been responsible for its own programming, and that autonomy has allowed institutions to independently accept student and credits. Hence, mobility within the sector is somewhat straightforward (though transferring to different programs is an issue discussed in more detail below). In 2012 a group of seven Ontario universities formed a university credit transfer consortium which allows students to count any first year arts and science course taken for credit at a participating university for general credit at their home institution (CNW Group 2012).

Trust between sectors is harder to establish and maintain because of each sector's lack of familiarity and interaction with the other sector and thus uncertainty about what occurs in the other sector. This uncertainty reduces trust in the other sector's curriculum, quality and the ability of transfer students. Consequently moving between the two sectors is more difficult than moving within the sectors. In some cases a university's uncertainty about a college's curriculum in a core area led not to a conversation between the university and college faculty, but to the university insisting on a high school grade in a subject covered in the college diploma (Arnold, 2015).

4. Mobility: Students, pathways and credits

Having laid out the primary policy areas in the previous section, this section considers the way students are moving through the system, the ways pathways are being developed to support them, and how credits are awarded.

4.1 Current mobility trends

There are significant challenges in student mobility, credit transfer and articulation. There is a good deal of movement across provincial boundaries. In a survey of 40 universities across the nation, it was found that 18% of students lost prior credits when transferring to another province (Heath 2012a). Similar research within Ontario highlights that students transferring institutions within the province are also likely to lose prior credits particularly if they are transferring from a college to university (Heath 2012b). For decades, in most provinces in Canada credit transfer has been negotiated between courses individually (Junor and Usher 2008), and many provinces are still developing course-to-course credit transfer using course hour equivalences.

For these and other reasons the nature and structure of pathways differs between areas of study, preventing the development of a uniform approach to developing pathways. Nonetheless, the demand for student transfer is likely to remain strong. Decock (2004) cites credentialism as that the reason for higher student demand for transfer: higher demand for university programming across the board means that college bound students also see the degree as the pinnacle. Similarly, the degree becomes more attractive to students when college trained and university trained individuals are competing for the same jobs. Hence the economy and the structure of work plays a role in transfer and mobility, which suggests that having high or low transfer rates is not necessarily good or bad, but relative to the needs of students and the economy (Moodie, 2003). LeSage et al (2014) also note that transfer may have increased as more students use college as preparation for universities, and noting their plan to transfer from college to university and are actively trying to gain credit for past educational achievements.

Future student transfer is likely to be further influenced by changing demographics and institutional policies. The Ontario education number will support a much fuller and richer analysis of transfer patterns.

4.2 Access and accessibility

Access and accessibility to higher education are slightly different concepts. Access suggests any qualified individual has the opportunity to attend a postsecondary institution. Polices to support access focus on disadvantaged groups, or groups that have a proportionally lower presence in postsecondary education such as low-income or Aboriginal students in Ontario. Access policies are often about supporting student choice to attend postsecondary education.

Accessibility, on the other hand, is arguably more practical. A student may encounter obstacles or difficulties in exercising their theoretical right of access in gaining admission to a program or institution, and then being able to physically attend. Issues of accessibility have long been a priority for the Ontario government given the disparate population across the province,

particularly in the northern region. Contact North is a network that supports online and distance education for K-12 and college level programming, and the newly developed Ontario Online network of university degree programs will provide high quality programming from Ontario's best lecturers.

The availability of online education is one way of ensuring that all regions have equal (or equitable) education opportunities, but face-to-face education is still the primary mode of delivery, particularly for inexpert or disadvantaged students (Moore, Shulock, Ceja and Lang, 2007). And, as Frenette points out, geographic proximity is a major factor in decision-making about attending postsecondary education, particularly for lower income individuals (Frenette, 2004; Frenette, 2006). His research found that Canadian low-income high school students were more likely to attend a nearby college than move away to university. He found that students would readily commute from 0 to 40 kilometres, possibly commute from 40 to 80 kms and that they would rarely commute beyond 80 kms. The research determined that "when no university is nearby students from lower income families are fare less likely to attend than students from upper incomes families" (Frenette, 2004. p. 17).

Thus, there is a strong social equity issue in accessibility. Students from smaller communities are more likely to start their postsecondary education close to home, but they should have the opportunity to transfer elsewhere. For example, students from northern Ontario may choose to start their postsecondary education but move south for a wider variety of educational opportunities.

Another issue of accessibility is the acceptance rate of an institution. The differentiation strategy under which Ontario institutions are operating promotes excellence by allowing institutions to set their own priorities. Some may choose not to broaden access further in favour of developing as a smaller niche institution. However, the impact on potential students in the proximate/commutable region must be considered.

4.3 Depth and breadth of pathways

Pathways can be developed in a number of different ways, and it is beyond the scope of this literature review to provide detailed examples. However, many partnerships are arranged by programs and institutions acting with only one or perhaps a handful of partners. LeSage et al. (2014)) observe that 'various transfer, or pathway programs, that emerged within Ontario were typically institution – or program-specific and often without the guidance of provincially mandated guidelines'. CMEC (2012) notes, for example, that between 2009 and 2012, the number of credit transfer pathways in Ontario increased by 30%.

The assumption is that if pathways are developed students will use them. Pathways are rarely developed based on market research that has found that there is strong student demand for the pathway. Nor are pathways usually developed in response to the labour market or to reflect broader quality assurance and accreditation structures. For example, Mitchel et al., (2013) suggest that articulation agreements change only the periphery, not the core relationship between the sectors or the underlying system factors that help or hinder students achieve their goals.

University systems are much better at handling students who follow a standard pattern that is followed by most other students. Handling exceptions can rarely be automated, they often fall outside standard policies, they may require the exercise of expert judgment and they may require the exercise of discretion which may require an additional level of approval. Exceptions are therefore almost always much more expensive to manage than the norm. Critical friends said that admitting students direct from school is the standard pattern which universities handle much more readily, cheaply and efficiently than transfers from college who are a small minority of students admitted by Ontario universities. All parts of universities, from faculty to staff and from academic departments to registrars' officers find it much more efficient to handle students who follow the main patterns. The default position for all parts of the university tends to be to deal with the main cases first, for example, by admitting students directly from school, and dealing with exceptions such as college transfers second when capacity allows.

Work in a different context (Moodie, 2009; Moodie, Wheelahan, Billett and Kelly, 2009) suggests that a group of students needs to be around 20% of total students to warrant establishing standard policies, procedures and systems to handle them efficiently. Clearly transfer students are way below this 'tipping point' (Grodzins, 1958) and so will need to continue to be managed as exceptions for the foreseeable future.

4.4 The value of credits

There are different ways in evaluating the success of pathways. One is by the number of pathways that are established, another is by the number of students who use them, and a third is by the number of credits that are awarded. All are important, and may vary in relation to each other. For example, an interesting finding from Kerr et al.'s (2010) report on credit transfer in Ontario is that while there are fewer students moving between programs and institutions in Ontario than the rest of Canada, the amount of credit that is provided may actually be higher. Unfortunately the data did not allow Kerr and colleagues to distinguish students transferring with complete or incomplete qualifications and thus needing to transfer different amounts of credit. Nevertheless it seems that lower numbers of Ontario students were repeating courses, which suggests that the pathways are working well or that much of the mobility in Ontario is post-graduation when they are not trying to gain credit recognition.

Noting the same trends in his own research Heath (2012b) distinguished between two types of Ontario's students calling them "transfer students" when they are given credit and "mobile" when they move after graduating from another program and credit is not provided (p. 17). He notes that 80% of a sample of Ontario students received credit for previous education, which is considerably more than the systems in other jurisdictions which may have been established with an explicit transfer function. This suggests that the articulation agreements in Ontario are doing their job and benefitting students as they are receiving credit for their previous work and likely following the pathway.

One systematic issue that can confound smooth transitions is how the educational process is conceptualised and operationalised. The Higher Education Strategy Associates (2011) note that a significant issue in Ontario is the lack of a common definition of a credit. This is a confounding issue, where some universities give credit for 24 hours of classroom time (2 hours/week x 12

weeks), while others require 39 (3 hours/week x 13 weeks). This certainly confounds transfer arrangements.

Because of the complicated systems of credit accumulation, equivalencies and independence in decisions on how much is accepted, there is no data that provides system level information on the amount of credit transfer. ONCAT's database provides information on what each pathway is willing to accept, but the variety and nuance of each makes any comparisons impossible. Hence, the focus of this research is on student mobility and pathways rather than credit transfer. And, arguably, it is important to consider how student mobility and pathways can be supported as key issues in their own right.

4.5 Summary

In undertaking this work we recognise that while simple in concept, the realities of student mobility, transfer and pathways policy work is not so straightforward. Furthermore there are challenges of working with system level policies and data collection, of the need to respect intuitional and programmatic autonomy, as well as practicalities of everyday operations in the institutions.

We note the importance of structural and political confines of the system under which we operate. In Ontario we work with the binary sectors of colleges and university that have different understandings, terms, policies and procedures that dictate many issues and confound many conversations. Also important are the more complex issues that Ontario's system contends with such as the policy push for differentiation and the pressure on colleges to both support mobility of their students by partnering with universities, while at the same time being urged develop degrees in order to support both educational and occupational progression and access within the institutions.

These issues highlight the political realities of institutions, where issues of reputation, economics and competition are foremost in the minds of leaderships. Certainly, there are everyday administrative hurdles, which, in any policy are the can confound success. Regardless of how sound a policy goal is, if it is too burdensome to implement it will be circumvented. For example, it is recognised that there would be benefit to telling students which, and how many, credits they will receive at the same time as they receive their acceptance. This doesn't happen because the administrative significant cost of preparing that information, and not all students who receive acceptance letters actually attend. Thus, the institution saves money by doing it after the fact only for the students that attend. Of course this is a sound business decision, but it circumvents the system wide goals.

What these examples intend to highlight, is that it is often small actions, or inactions, that can shape the ways a policy works and the system operates, and sometimes it's important to take a step back to remember the goal and then to see if the policy activities are working to achieve that goal.

And that was the intention of our research. We wanted to examine mobility trends and pathways developments to see if they are supporting the achievement of the ultimate goals. The development of pathways and partnership agreements has been one of the primary policy

priority in the past 10 years, and a main policy directive for both ONCAT and the Ontario government overall.

Hence our work focuses on policy and partnerships to determine what type of impact they were having on the system. We wanted to understand what types of pathways were being developed, in what programs, and how was that impacting student mobility. Our goal was -and is – to take what we've learned and make it useful to the policy makers and implementers.

5. Methods

The data used to inform this project came from four sources. Data from the 2013 National Graduates Survey (NGS) was used to depict pathways-by-fields which had the most student traffic, as well as the fields that acted as senders and receivers of transfer students. A second data source was the 2013/2014 Graduate Satisfaction Survey (GSS) of college graduates that captures college graduates who transferred into another program in a university. The ONCAT dataset that holds information on pathways available to students via formal arrangements was examined to see how many, what type, and between what programs/institutions, partnerships arraignments exist. Finally, through using Google maps, an analysis of the distance between partner institutions was performed. The aim was to get a sense of transfer-student pathway use, and whether distance played a role in mediating this use. The following sections will briefly discuss these data sources, and a fuller discussion of the methodology can be found in Appendix B.

The following lines of inquiry were explored:

1) What receiving pathway agreements did public universities have with their sending college partners?

2) Were these receiving pathways for specific qualifications and fields of education, or for generic pathways that did not specify the field of education of the sending and receiving qualification?

3) How geographically close were the pathway partners and thus how practical were articulated pathways?

4) How heavily are the pathways used?

To get a sense of the current landscape of existing transfer articulation within Ontario postsecondary education, these questions were examined at the system level and at the institutional level where institutional profiles of each Ontario postsecondary institution were developed.[2]

As the report takes the position that college-to-university transfer represents social mobility, the data represented in this main report will focus on the college-to-university pathways, and will draw from data summarized from the university institutional profiles. Each institutional profile depicts the institution as a receiver of transfer students. A typical university institutional profile will show what paths currently exist for college students, both seen by sending institution, and by sending program.

[2] Institutional profiles were constructed for 22 publicly funded universities and 24 publicly funded colleges. Institutional profiles for each college can be found in Appendix C and for each university in Appendix D.

5.1 Data Sources

2013 National Graduates Survey (NGS)

One of the datasets in this study is from the 2013 National Graduates Survey (NGS) – class of 2009/2010 conducted by Statistics Canada from April 2nd to September 1st, 2013. The survey was designed by Statistics Canada to investigate the links between postsecondary education and the labour market. It collects data such as students' field of education, their level of qualification and their employment three years after graduation. The full dataset of NGS 2013 contains 28,715 records and more than 900 original and derived variables. The survey uses a stratified random sample design. The sample of 28,715 graduates was drawn from a population of 431,921 graduates who completed the requirements of an admissible program some time in 2009-10 from a recognized public postsecondary Canadian institution and who were living in Canada or the United States at the time of the survey (with the exception of US citizens living in the United States at the time of the survey) (Statistics Canada, 2014). Using the application of a weight variable provided by Statistics Canada, weight estimates were obtained for the entire population. Readers should note that the credential type (i.e. diploma, advanced diploma, bachelors degree, master's degree) is not captured in this data. Also, as the data only captures credential holders, it does not capture students who transfer during their program, or students who withdrew from a program and re-entered postsecondary education.

Ontario College Graduate Satisfaction Survey

Student transfer data were gathered as a secondary analysis from a study performed by colleagues at Seneca College, which used the 2013/2014 Ontario College Graduate Satisfaction Survey (GSS). Broadly, the Graduate Satisfaction Student Survey is administered 6 months after graduation, and details graduates' satisfaction with their college education in achieving their post-graduate goals, whether it be in securing future employment or in continued education (McCloy & Liu, 2010). Data received from Seneca colleagues summarized 2013-14 Ontario CAAT/college graduates who reported attending university full or part time and enrolled in any credential six months after graduation. Around half of college graduates responded to the GSS. The team assumed that non-respondents had the same characteristics as respondents and so doubled the number of students who reported transferring to estimate the total population of transferring students. We recognise this is a somewhat 'rough and ready' calculation, but we were interested in trajectories rather than precise numbers. Moreover, this is the only data that is readily accessible, until data from the Ontario Education Number is available for researchers to explore.

From the estimated total number of student transfers the team calculated an approximate "transfer student-per-pathway" ratio to illustrate the magnitude of student traffic per pathway agreement. The research team understands that the "transfer student-per-pathway" ratios may not reflect an accurate reality of transfer student numbers for institutions, as the data is limited by virtue of secondary analysis, as well as recoding of an open ended "other" field as performed by Seneca colleagues. Moreover, the data do not capture transfer students who enrolled in a university program without finishing their college credential, or college graduates who enrol in a university program more than a year after they complete their college credential. It is therefore important to stress that the estimated number of total transfer students and the approximate ratios of graduate per pathway may not reflect accurately actual graduates per pathway. The data will therefore be used only to suggest trends in transfer student mobility.

ONCAT pathway articulation data set

The team obtained a comprehensive dataset outlining all articulation agreements of Ontario post-secondary institutions from the Ontario Council of Articulation and Transfer (ONCAT). Examining only approved articulation agreements; the team coded "generic" pathways as a pathway that articulated transfer from a non-specific sending program, and "specific" pathways were pathways that articulated transfer from a discipline-specific sending program to another discipline-specific program. Some distinctions must be made here regarding the language of "generic" and "specific" pathway counts used in the reports.

The research team wanted to approach the transfer pathway analysis not from an institutional perspective, but from a student perspective. The aim was to ask the question, what pathways are available to students should they wish to transfer, and would field of study matter? So to draw some comparisons, pathways as defined by institutions as multi-lateral systems pathways agreements were similar to what we defined as generic pathways for students. In other words, regardless of prior of field of study, as long as students had a college credential (i.e. any 2 year of 3 year diploma) these would be the available routes for them at the receiving institution. Bilateral, or direct entry programmes, were similar to specific pathways. That is, they linked a specific college program in a specific field of study with a specific degree in (usually the same) field of study in the partner university. This means, for example, that students could use an arts transfer pathway at the receiving institution, if they had a college credential in a specific field of study. The research team then consulted institutions to provide feedback of the profiles developed, to ensure that the profile we had developed for their institution reflected the pathways they had registered with ONCAT.

A limitation identified by this data source is that not all institutions responded to this consultative process, and not all institutions regularly update ONCAT with their more recent transfer pathway agreements. Thus the data portrayed within institutional profiles may not reflect the most recent portrait of transfer pathways offered. The study is therefore limited to just the data made available through ONCAT, and the feedback received from institutional partners through the consultation process.

Geographical proximity data

In line with question 3, the team was interested in understanding how feasible these pathways were for students to follow by commuting from their initial institution. Distances (in kilometres) and commuting time (in hours) between sending and receiving institutions were calculated with Google Maps (a more thorough discussion can be found in Appendix B). Informed by previous work done by Frennette (2004), reasonable commuting parameters were considered around 80 km or 1 hour commuting time. To deal with institutions that had multiple campuses, the team chose the campus the institution designated as its main campus as the institution's point of reference; if this wasn't specified, the campus that hosted the most students or offered the most programs was used. This is a limitation of the study since smaller campuses may be distant from the main campus.

6. Data analysis and findings

6.1. Ontario student transfer patterns by broad and narrow fields

The following tables present significant patterns of transfer by Canadian postsecondary education graduates who returned to postsecondary education for another credential and graduated in 2009. Using 2013 National Graduates Survey (NGS) data, the first four tables summarize student trajectories by broad field of study (for example, Health and Related Fields), and the last four tables feature the subfields of the 2009 credential (for example, Health Medical Assisting)

For both the Broad Field and Subfield Flows, student movement is captured in 4 ways:

1) Students moving from a college credential to a college credential
2) Students moving from a college credential to a university credential
3) Students moving from a university credential to a college credential
4) Students moving from a university credential to a university credential.

The five biggest field-pathway flows with the most student volume are depicted. Two time points must be noted within this analysis, credentials obtained in 2009/2010, and credentials obtained prior to 2009/2010. The tables summarize the fields of study in which students obtained their first/prior credential, and the percentage of this population who continued on into their 2009/2010 credential. The purpose of this juxtaposition is to see which fields of study are the "big senders" and which are the "big receivers" of transfer students.

Table 2 shows that the five most travelled transfer flows for 46% of college graduates who completed another college credential are generally within the same broad fields, with 59% of architecture, engineering, and related technologies college to college transfer graduates getting their second college qualification in the same field. The same goes for health and related fields graduates, with 56% of college to college transfer graduates continuing in the same field, and 35% of business, management, and public administration college to college transfer graduates staying in the same field. Other important transfer flows were between the broad fields of health and related fields and business, management, and public administration (29%), and between the broad fields of business, management, and public administration, and social and behavioural sciences and languages (24%).

Table 2: Five most travelled flows of Canadian college graduates who subsequently received an Ontario college credential in 2009, by broad field and subsequent broad field

Field of prior credential (sending field)	Number of college graduates who obtained a 2009 college credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 college credential in the receiving field
Architecture, engineering, and related technologies	2,220	Architecture, engineering, and related technologies	59%
Health and related fields	2,100	Health and related fields	56%
Health and related fields	2,100	Business, management and public administration	29%
Business, management and public administration	2,280	Business, management and public administration	35%
Business, management and public administration	2,280	Social and behavioural sciences and languages	24%

Total number of transfer graduates: 9,640

The five most travelled transfer flows for 48% of college graduates completing a subsequent university qualification are shown in Table 3. Most (57%) of college to university transfer graduates from business, management, and public administration completed their second qualification in the same field, while 29% opted to do so in humanities. Humanities also serve as a strong receiving field (61%) for social and behavioural sciences and languages college to university transfer graduates. Also of note, though the numbers are smaller, the great majority (72%) of health and related fields college to university transfer graduates completed their second qualification in the same field. Finally, the fifth most travelled transfer flow is in the broad field of humanities, with 55% of the college humanities transfer graduates getting a subsequent social and behavioural sciences and languages university qualification.

Table 3: Five most travelled flows of Canadian college graduates who subsequently received an Ontario university credential in 2009, by broad field and subsequent broad field

Field of prior credential (sending field)	Number of college graduates who obtained a 2009 university credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 university credential in the receiving field
Business, management and public administration	2,760	Business, management and public administration	57%
Business, management and public administration	2,760	Humanities	29%
Social and behavioural sciences and languages	1,680	Humanities	61%
Health and related fields	860	Health and related fields	72%
Humanities	760	Social and behavioural sciences and languages	55%

Total number of transfer graduates: 9,160

Table 4 shows the five most travelled pathways used by 50% of the university graduates transferring to complete a subsequent college qualification. Important flows exist within the broad field of social and behavioural sciences and languages, with 35% of university to college transfer graduates staying in the same broad field, and 49% of university to college transfer graduates completing a qualification in business, management, and public administration. Humanities also serve as a strong sending field. 40% of humanities' university to college transfer graduates got a university qualification in business, management, and public administration, and 23% got theirs in social and behavioural sciences and languages. Also of note, 62% of physical and life science university to college transfer graduates got their second qualification in health and related fields.

Table 4: Five most travelled flows of Canadian university graduates who subsequently received an Ontario college credential in 2009, by broad field and subsequent broad field

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 college credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 college credential in the receiving field
Social and behavioural sciences and languages	2,200	Business, management and public administration	49%
Social and behavioural sciences and languages	2,200	Social and behavioural sciences and languages	35%
Humanities	1,640	Business, management and public administration	40%
Physical and life sciences and technologies	1,060	Health and related fields	62%
Humanities	1,640	Social and behavioural sciences and languages	23%

Total number of transfer graduates: 7,020

Important transfer flows are also found within the university sector (including into Masters and PhD). Table 5 shows the five most travelled ones, which account for 36% of the transfer graduates. Of those, three are within the same broad field. 38% of university to university social and behavioural sciences and languages transfer graduates stayed in the same field. A rather higher 68% of health and related fields graduates moved within the same broad field and physical and life sciences was also relatively high (41%). Education serves as a strong receiving field for university to university transfer graduates from humanities (39%) and social and behavioural sciences and languages (22%).

Table 5: Five most travelled flows of Canadian university graduates who subsequently received an Ontario university credential in 2009, by broad field and subsequent broad field

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 university credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 university credential in the receiving field
Social and behavioural sciences and languages	7,360	Social and behavioural sciences and languages	38%
Humanities	5,880	Education	39%

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 university credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 university credential in the receiving field
Health and related fields	2,940	Health and related fields	68%
Physical and life sciences and technologies	4,380	Physical and life sciences	41%
Social and behavioural sciences and languages	7,360	Education	22%

Total number of transfer graduates: 29,240

6.1.1. Movement between broad field to subfield by sector (NGS 2013)

The next set of tables show the most travelled transfer flows between sectors, as in the previous section. This time though, the receiving fields have been narrowed down to subfields more closely related to occupations.

Table 6 shows the most travelled transfer flows for 35% of the college graduates who then obtained a second college qualification. 50% of college to college architecture, engineering, and related technologies transfer graduates obtained a second technician qualification, while another 20% chose business. A good proportion (31%) of health and related fields college to college transfer graduates obtained a second college credential in health medical assisting. In a similar fashion, 28% of business, management, and public administration college graduates got their second college credential in business. Finally, another important pathway exists between business, management, and public administration, and social and behavioural sciences (23%).

Table 6: Five most travelled flows of Canadian college graduates who subsequently received an Ontario college credential in 2009, by broad field and subsequent subfield

Field of prior credential (sending field)	Number of college graduates who obtained a 2009 college credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 college credential in the receiving field
Architecture, engineering, and related technologies	2,300	Technician	50%
Health and related fields	2,060	Health medical assisting	31%
Business, management and public administration	1,980	Business	28%
Architecture, engineering, and related technologies	2,300	Business	20%
Business, management and public administration	1,980	Social and behavioural sciences	23%

Total number of transfer graduates: 9,400

The five most travelled transfer flows for graduates between college and university, and counting for 49% of those transfer graduates, are shown in Table 7. Business, humanities, and social and behavioural sciences are strong receiving fields. Business, management, and public administration sees 55% of its college to university transfer graduates getting their second credential in business, and 29% in humanities. For the broad field of social and behavioural sciences and languages, a majority (60%) of its college to university transfer graduates obtain their second qualification in humanities. Beyond these three flows, transfer graduates numbers

drop significantly for the next two, yet both flows point to the same receiving field. Humanities is an important sending field for social and behavioural sciences (56%), but so is personal services, with 46% of their college to university transfer graduates obtaining their second qualification in social and behavioural sciences.

Table 7: Five most travelled flows of Canadian college graduates who subsequently received an Ontario university credential in 2009, by broad field and subsequent subfield

Field of prior credential (sending field)	Number of college graduates who obtained a 2009 university credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 university credential in the receiving field
Business, management and public administration	2,780	Business	55%
Social and behavioural sciences and languages	1,700	Humanities	60%
Business, management and public administration	2,780	Humanities	29%
Humanities	720	Social and behavioural sciences	56%
Personal services	820	Social and behavioural sciences	46%

Total number of transfer graduates: 8,440

Table 8 shows the most travelled pathways by university graduates who transfer to college to get a subsequent qualification. These five pathways are important pathways that are used by 38% of the total number of graduates with a prior university qualification who subsequently graduated from a college credential in 2009. Business is a strong receiving field for social and behavioural sciences and languages, with 32% of university to college transfer graduates coming from that field, and for humanities, with 37% of their university to college transfer graduates pursuing a second qualification in business. Some 25% of social and behavioural sciences and languages university to college transfer graduates also choose social and behavioural sciences as a subsequent college qualification, as well as human services (18%). Finally, 42% of physical and life sciences and technologies university to college transfer graduates choose health medical assisting for their subsequent college qualification.

Table 8: Five most travelled flows of Canadian university graduates who subsequently received an Ontario college credential in 2009, by broad field and subsequent subfield

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 college credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 college credential in the receiving field
Social and behavioural sciences and languages	2,160	Business	32%
Humanities	1,720	Business	37%
Social and behavioural sciences and languages	2,160	Social and behavioural sciences	25%
Physical and life sciences and technologies	1,040	Health medical assisting	42%
Social and behavioural	2,160	Human services	18%

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 college credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 college credential in the receiving field
sciences and languages			

Total number of transfer graduates: 7,040

For university to university transfer graduates' five most travelled transfer flows, which account for 24% of university graduates who went on and obtained a subsequent university qualification, Table 9 shows humanities is a strong sending field. Some 23% of humanities university to university transfer graduates stay within the same field, 21% choose teacher education as a subsequent subfield, and 17% choose education other. A strong pathway is found within social and behavioural sciences, where 25% of the social and behavioural sciences and languages university to university transfer graduates stay within social and behavioural sciences for their subsequent qualification. A similar pattern is also found within physical and life sciences, where 30% of physical and life science and technology university to university transfer graduates obtain their subsequent qualification in the physical and life sciences subfield.

Table 9: Five most travelled flows of Canadian university graduates who subsequently received an Ontario university credential in 2009, by broad field and subsequent subfield

Field of prior credential (sending field)	Number of university graduates who obtained a 2009 university credential	Field of 2009 credential (receiving field)	Proportion who obtained their 2009 university credential in the receiving field
Social and behavioural sciences and languages	6,760	Social and behavioural sciences	25%
Humanities	5,840	Humanities	23%
Humanities	5,840	Education teacher	21%
Physical and life sciences and technologies	4,060	Physical and life sciences	30%
Humanities	5,840	Education other	17%

Total number of transfer graduates: 27,180

6.2 Ontario Institutional activities

Table 10 presents a summary of the information found in the institutional profiles3, focusing on the relation between colleges as sending institutions and universities as receiving institutions. The table shows great variations between receiving universities. Most universities have partnerships with the great majority of Ontario colleges, with the exception of Queen's University, the University of Toronto, and the University of Waterloo, which have very few partnerships. The number of generic pathways between sending colleges and receiving universities also shows great variation. Some universities have only specific pathways, while other universities have generic pathways for all two or three year college programs. As with most pathways between colleges and universities in Ontario, transfer students must first win admission to the degree through a competitive entry process before they are awarded credit in

[3] Found in Appendices C and D

the degree for their college program. Although the number of specific pathways is similar to the number of generic pathways, the distribution of these is quite different, and in most cases complementary, to the distribution of generic pathways, pointing to a possible strategic choice differentiating universities. For example, Lakehead University has no generic pathway and 574 specific ones, while York University has 1,929 generic pathways and 31 specific ones. In general however, universities tend to offer more specific pathways than generic ones, as can be seen by looking at the medians and the means for those two variables. The total number of pathways, generic or specific, follows from the previous trends mentioned. Of note, the variability remains very high, with some universities having very few or no pathways for transfer students, even when adding together generic and specific pathway agreements.

Based on the results of the Graduate Satisfaction Survey of Ontario college graduates, the team also compiled data showing the estimated number of students per pathway. As the data shows, the numbers are quite low, with high variations. The median is 1.3 students per pathway, while the mean is pulled upwards by universities receiving a high number of transfer students in a select number of pathways. Of interest, universities with a number of generic pathways above the median do not have, with the sole exception of Brock University, a number of specific pathways above the median. A similar pattern is found for specific pathways. More pathways do not lead to more transfer, except for Ryerson University and York University, which have a number of pathways far exceeding the other universities and also more transfer students, though their student per pathway ratio, as measured in the last column, is among the lowest of the sample. The University of Toronto is also unusual. It is a very big university but accepts only an estimated 256 transfer students, between the median and mean for all Ontario universities. However, the University of Toronto has only 7 pathways, giving an unusually high estimate of 37 students per pathway.

Table 10: Summary of partnerships and generic and specific pathways between sending colleges and receiving universities, by university, Ontario

Receiving university	Number of College partnerships	Number of generic pathways	Number of specific pathways	Total number of pathways	Estimated number of college transfer students	Estimated number of students per pathway
Algoma	24	120	430	550	84	0.2
Brock	24	48	196	244	306	1.4
Carleton	24	0	229	229	248	1.1
Lakehead	24	0	574	574	270	0.5
Laurentian	25	66	258	324	262	0.8
McMaster	25	0	131	131	194	1.5
Nipissing	24	24	156	180	240	1.3
OCAD	14	0	14	14	48	3.4
Queen's	0	0	0	0	34	0.0
*Ryerson	54	1,863	538	2,399	658	0.3
Trent	22	5	132	137	206	1.5
Guelph	24	1	136	137	208	1.5
UOIT	25	192	1,065	1,257	322	0.3
Ottawa	24	48	58	106	384	3.6
Toronto	5	5	2	7	256	36.6
Waterloo	10	1	11	12	104	8.0
Windsor	25	6	300	306	168	0.5

Receiving university	Number of College partnerships	Number of generic pathways	Number of specific pathways	Total number of pathways	Estimated number of college transfer students	Estimated number of students per pathway
Western	18	2	54	56	278	5.0
Wilfrid Laurier	23	43	89	132	174	1.3
York	29	1,929	31	1,960	834	0.4
Total	443	4,353	4,404	8,755	5278	69.1
Median	24	6	134	159	244.0	1.3
Mean	22.2	217.7	220.2	437.8	263.9	3.5
Standard deviation	10.6	576.2	262.4	665.2	190.2	8.0
Lowest value	0	0	0	0	34	0.0
Highest value	54	1,929	1,065	2,399	834	36.6

*Ryerson University counts include both college and university partnerships/pathways

Also of interest to the team were the number of pathway agreements and transfer of students between institutions within commuting distance. The data compiled for the analysis of partnerships and pathways between sending colleges and receiving universities can be expanded to look more closely at the institutions within commuting distances from one another (usually within 80 km).

Table 11 presents results similar to those presented in the preceding Table (9), but only for institutions within commuting distance. Ontario universities have between one and ten colleges within commuting distance, with the majority having between 1 and 3 colleges in commuting distance, and the universities located in southern Ontario having between 6 and 10 colleges within commuting distance. Overall, universities have very few pathways with colleges within commuting distance. The median of the overall number of pathways is 16%. Also of interest, universities have very few generic pathways with colleges within commuting distance, with a median of one generic pathway, while they have typically three (median) colleges within commuting distance. However, student transfer data from the Graduate Satisfaction Survey shows that students transfer in great numbers to universities within commuting distance, with a median of 64%. Similar patterns can be discerned from the data, with universities favouring either generic or specific pathways, or none, but not both, with the exception of UOIT. The number of generic pathways is significantly smaller than the number of specific ones, if one removes York University from the sample. Also of note, although Ryerson University showed a great number of generic pathways with colleges, it has no generic pathway with the seven colleges within commuting distance. The number of pathway agreements does not seem to be influenced by the number of proximate colleges, as percentages of pathways varying across the universities. Finally, the table shows that a significant percentage of students transfer between proximate institutions, while the percentage of pathways between proximate institutions remains small.

Table 11: Summary of partnerships and generic and specific pathways between proximate sending colleges and receiving universities, by university, Ontario

Receiving university	Number of proximate colleges	Number of generic pathways with proximate colleges	Number of specific pathways with proximate colleges	Total number of pathways with proximate colleges	Percentage of pathways with proximate colleges	Number of transfer students from proximate colleges	Percentage of transfer student from proximate colleges
Algoma	1	5	31	36	7%	32	38%
Brock	3	6	48	54	22%	834	55%
Carleton	2	0	41	41	18%	196	79%
Lakehead	2	0	36	36	6%	60	22%
Laurentian	2	3	43	46	14%	116	44%
McMaster	7	0	30	30	23%	144	74%
Nipissing	1	1	8	9	5%	64	27%
OCAD	7	0	7	7	50%	40	83%
Queen's	2	0	0	0	0%	10	29%
Ryerson	7	0	118	118	5%	620	94%
Trent	2	4	49	53	39%	84	41%
Guelph	6	1	41	42	31%	148	71%
UOIT	6	32	263	295	23%	114	35%
Ottawa	2	4	9	13	12%	320	83%
Toronto	7	0	6	6	86%	230	90%
Waterloo	3	0	1	1	8%	44	42%
Windsor	1	0	30	30	10%	96	57%
Western	2	2	30	32	57%	216	78%
Wilfrid Laurier	3	4	9	13	10%	122	70%
York	10	658	21	679	35%	802	96%
Total	76	720	821	1,541		4,292	
Median	3	1	30	34	16%	119	64%
Mean	3.8	36.0	41.1	77.1	23%	214.6	61%
Standard deviation	2.7	146.6	58.5	155.7	22%	246.6	24%%
Lowest value	1	0	0	0	0%	10	22%%
Highest value	10	658	263	679	86%	834	96%

7. Discussion of research findings

Using data from the National Graduate Survey, the ONCAT pathway articulation dataset, and estimates of students' transfer from college to university (using the proxy of student transfer numbers in the Graduate Satisfaction Survey), this research has presented results using those sources and presenting findings about student transfer patterns, pathways between colleges and universities, and geographic trends, and will now discuss those findings.

7.1 Ontario student transfer patterns by broad and narrow fields

The data presented in Tables 2 to 9 for the top five student pathways used by graduates show several important patterns. First, they are of similar size, but only when we exclude university to university transfer from bachelor's degree to master's, and from master's to PhD qualifications. Second, 11 of the top 20 pathways are not within the same broad field of study. This suggests that more attention should be given to articulation between complementary programs in different broad fields. The other nine of the 20 top pathways are within the same broad field of study. These are: architecture, engineering, and related technologies (college to college only); business, management, and public administration (college to college and college to university); health and related fields (college to college, college to university, and university to university); social and behavioural sciences and languages (university to college and university to university); and physical and life sciences (university to university only). Of these, only health and related fields show a steady upward transfer pattern across sectors.

Third, there are strong transfer flows between the three broad fields of humanities, social and behavioural sciences and languages, and business, management, and public administration, with 11 of the 20 top pathways involving those fields. These three broad fields are both strong sending fields and strong receiving fields.

These results should guide institutions in their efforts to offer meaningful pathways that are likely to be used by graduates as they pursue a new credential.

7.2 Ontario pathway articulation dataset and institutional profiles

Tables 10 and 11 presented summary data on pathway agreements between sending colleges and receiving universities. The data show first that institutions have approached pathway agreements with different strategies, resulting in very different patterns of generic and specific agreements. Some universities favour generic pathway agreements, while other universities prefer specific pathway agreements. The data point to generic pathways having more impact on student use. However, the data is largely driven by Ryerson University and York University, which have emphasized generic pathways to a greater extent (around 1,900 generic pathways) than other universities (around 50 generic pathways). Yet, these two outliers show low ratios of estimated students per pathway, while still the highest number of transfer students compared to other Ontario universities.

These results lead to questions of efficiency. What remain unclear from the data are the effort and the costs involved in drawing generic or specific agreements. Generic agreements would likely require less effort and lower costs to build than specific ones, but probably more to administer, as each individual case needs a more thorough assessment.

The data presented thus far do not take the size of the institution into account. Table 12 shows the estimated number of college transfer students, drawn from the Graduate Satisfaction Survey of Ontario college graduates, as well as the number of first year incoming students, which allows to control for size and obtain the percentage of transfer students in relation to the number of first year students. First, there is no relation between the size of the institution and the number of pathways. Second, smaller universities tend to receive a greater percentage of transfer students than larger universities. Also of note, the percentages of estimated transfer students are for the most part resoundingly small, with a median of 1%.

Table 12: Summary of pathways agreements and transfer student populations, by university, Ontario

Receiving university	Total number of pathways	Estimated number of college transfer students	Number of 1st year students[4]	Estimated transfer students as a % of FTEs
Algoma	550	84	219	38.4%
Brock	244	306	3,394	9.0%
Carleton	229	248	4,884	5.1%
Lakehead	574	270	1,150	23.5%
Laurentian	324	262	1,512	17.3%
McMaster	131	194	5,313	3.7%
Nipissing	180	240	518	46.3%
OCAD	14	48	825	5.8%
Queen's	0	34	4,195	0.8%
*Ryerson	2,496	658	6,881	9.6%
Trent	137	206	1,475	14.0%
University of Guelph	137	208	5,479	3.8%
UOIT	1,257	322	1,863	17.3%
Ottawa	106	384	6,039	6.4%
Toronto	7	256	12,850	2.0%
Waterloo	12	104	6,020	1.7%
Windsor	306	168	2,217	7.6%
Western	56	278	6,016	4.6%
Wilfrid Laurier	132	174	2,861	6.1%
York	1,960	834	7,052	11.8%
Total	8,852	5278	80,763	
Median	159	244.0	3,394	6.4%
Mean	442.6	263.9	4,038	11.7%
Standard deviation	680.4	190.2	3,074	12.1%
Lowest value	0	34	219	0.8%
Highest value	2496	834	12,850	46.3%

*Ryerson University counts include both college and university partnerships/pathways.

[4] Source Council of Ontario Universities (2015) Application Statistics 2014

The number of transfer students is likely higher than the one reported by the Graduates Satisfaction Survey, as it counts only graduates transferring within six months of graduation. Despite this limitation, the data shows that taking the universities' size into account exacerbates the situation, with smaller institutions like Algoma University and UOIT taking more than the average of transfer students.

7.3 Geographic trends

Pathway agreements findings were also investigated by looking at proximate sending colleges. Data from table 11 show that universities did not tend to have more pathway agreements with colleges within commuting distance. Indeed, of the 8,852 pathway agreements, only 17% are with colleges within commuting distance. Given previous findings on the importance of distance in students' decision to attend an institution, these findings point to a severe gap in the offerings from a student's perspective.

Table 13 shows the percentage of pathway agreements, but this time divided by the number of proximate colleges to adjust for the different number of proximate colleges for each university. This operation provides a new ratio that takes into account the difference between institutions located in densely populated area, and having more partners within commuting distance, and those located in areas where there are few partners within commuting distance. The ratio shows that universities have very different strategies. Some universities have a high percentage of pathway agreements with proximate colleges only because they have a greater number of proximate colleges. For example, Algoma University and Brock University show different percentages, but when the number of proximate colleges is taken into account, these universities show similar patterns. On the other hand, universities with similar percentages of pathway agreements with proximate colleges, such as Trent University (39%) and York University (35%), have a very different number of proximate colleges, and very different ratios (19% versus 3%). In this last case, fewer agreements were struck, but with a greater number of partners.

Table 13: Summary of pathway agreements between proximate sending colleges and receiving universities and ratios, by university, Ontario

Receiving university	Number of proximate colleges	Percentage of pathways with proximate colleges	Ratio of percentage of pathways with proximate colleges by number of proximate colleges
Algoma	1	7%	7%
Brock	3	22%	7%
Carleton	2	18%	9%
Lakehead	2	6%	3%
Laurentian	2	14%	7%
McMaster	7	23%	3%
Nipissing	1	5%	5%
OCAD	7	50%	7%
Queen's	2	0%	0%
Ryerson	7	5%	1%
Trent	2	39%	19%
Guelph	6	31%	5%
UOIT	6	23%	4%
Ottawa	2	12%	6%

Receiving university	Number of proximate colleges	Percentage of pathways with proximate colleges	Ratio of percentage of pathways with proximate colleges by number of proximate colleges
Toronto	7	86%	12%
Waterloo	3	8%	3%
Windsor	1	10%	10%
Western	2	57%	29%
Wilfrid Laurier	3	10%	3%
York	10	35%	3%
Total	76	460%	
Median	3	16%	6%
Mean	3.8	23%	7%
Standard deviation	2.7	22%	7%
Lowest value	1	0%	0%
Highest value	10	86%	29%

The results show that universities, in general, do not tend to strike more pathway agreements with proximate colleges than with other colleges. Exceptions are Trent University and Western University, which both offer more specific pathways than generic ones, but also offer fewer specific pathways than the average. These findings on the relative proportion of pathway agreements struck with colleges within commuting distance contrast sharply with those presented on table 11, which shows that transfer students tend to favour proximate universities, with a median of 64% of transfer students choosing a proximate university.

Data collected for the purpose of this report points to clear and important areas of development for pathways between postsecondary institutions. First, though there are a great number of pathways created, more can be done to design them according to student needs and reported transfer trajectories. Student pathways are from college to university, but also, and in the same measure, between college and college, university and college, and university and university. Pathway policy should reflect and encourage the development of upward, but also lateral and reverse pathways across sectors and within sectors.

Second, current pathway policy has focused on the number of pathways offered. Data show that institutions do have a great number of pathways, but the overall percentage of transfer students per pathway is quite low. The data do not tell us which of the pathways students used, and it is likely that some are used more intensively than others. These results question the extent to which policy should focus on increasing the number of pathways, or whether attention should begin to focus on the number of students who are using pathways. Perhaps the real question should be whether the efforts are correctly targeting the right programs, or whether they offer attractive and easy ways to transfer between institutions, while receiving a fair recognition of past credits. This is an important question that this study was unable to address (because data that tracks the numbers of students in each individual pathway is not available), however, it is critical for the conversation and worthy of investigation.

Finally, this report finds that few institutions concentrate on developing agreements with institutions within commuting distance. This is a clear gap, given what other researchers have found regarding the tendency of students to stay within the same geographical area, and

regarding the specific challenges and needs of adult students who may have a job and a family to take into account when deciding on postsecondary education.

8. Summary and conclusion

The purpose of this report is to draw from recent research findings and inform future decisions about the structure, development, and articulation of transfer pathways between Ontario colleges and universities. To do so, the research team assembled findings from four main sources: a review of the literature; interviews with critical friends involved in Ontario pathways policy, research, development, and articulation; and data mined from Statistics Canada's National Graduate Survey (NGS), the Ontario Council on Articulation and Transfer (ONCAT) database, and from the Ontario Ministry of Training, Colleges, and Universities' (MTCU) Graduate Satisfaction Survey of college graduates.

A review of the pertinent research literature first reminds readers that credentials prepare graduates both for the labour market and for further studies, and, in so doing, are powerful engines of social mobility and equity. But if qualifications and pathways are to achieve these aims, transfer structures must be put in place to facilitate postsecondary mobility. Yet, this report finds that the Ontario system was not designed with a strong transfer structure. In other words, colleges were not established to prepare graduates for university, and each institution's aims are not only different, but not necessarily complementary. Therefore, efforts are required to overcome problems with a system that, from its inception, saw colleges and universities as distinct and terminal paths. Pathway agreements fall outside the normal activities of postsecondary institutions and are associated with new risks and concerns. As such, new drivers or facilitators need to be established and strengthened to encourage institutions to develop and implement pathway agreements. Such incentives are generally established by government agencies through policy.

Interviews with critical friends identified important variables limiting transfer between Ontario colleges and universities. The first is potential loss of revenue. Why would institutions facilitate students leaving their institution for another, especially as most of them can now offer a greater variety of credentials? The second is additional revenues. Critical friends have pointed that recruitment challenges tend to dramatically impact how an institution perceives the balance between the costs and benefits of transfer. Accordingly, regional and smaller institutions are more likely to facilitate transfer than bigger and established ones. Third is administrative systems and trust, and raises important questions about credit recognition. What is the cost for students who wish to have credits recognized? How and when is the decision to recognize prior credits made? What role does trust between individuals and between institutions really play in the development of pathway agreements?

The fourth section of this report explored recognized principles and variables associated with transfer in the research literature. Among the key variables influencing transfer are current mobility trends, which this report tries to bring to light, and geographic proximity, as most students, and in particular adult students, tend to study within commuting distance of their home. Also, transfer is not only a function of what is available, meaning what pathways are there, but also of labour market pressure, student choice, and the usability of established pathways. Employment prospects influence a student's decision to transfer to a particular program or a particular institution. Student preferences and aspirations also influence their decision. And finally, if institutions have a great number of pathways agreements, but these are only promises

of minimal credit recognition upon registration, and require students to go through bureaucratic hoops, and cost students extra, this may reduce students' propensity to undertake pathways.

Data analysis from surveys and databases shows there remains considerable room to improve existing pathway structures, development, and articulation. Current flows of students and established pathway agreements are not aligned. Students transfer in every direction in similar numbers, while expectations are geared towards upward transfer between college and university. Furthermore, colleges and universities do not tend to have more pathway agreements struck with neighbouring institutions than institutions located beyond commuting distance.

Ontario, through ONCAT and its member colleges and universities, has made a significant contribution to establishing a policy framework and institutional framework to facilitate the development of pathways, particularly from colleges to universities. Without this contribution, we would not now be in a position to build on this framework and consider the direction in which policy should go to maximise the potential of pathways to support student transfer with appropriate credit. This report's findings point to future policy adjustments that include:

- Developing pathways in complementary fields of education based on an analysis of student flows between qualifications, institutions and fields of education;
- Moving from a focus on the number of pathways to increasing the number of students who are using pathways. This would require thought about the type of pathways that are needed, and examining the balance between generic and specific pathways. Developing pathways is quite expensive for institutions, and effort should be invested where the most benefit can be gained; and,
- An emphasis on supporting partnerships within regions, given that most students transfer from a college to a university that is within commutable distance. This would involve explicit policy support for building regional partnerships, governance frameworks, and the conditions that are needed to build relations of trust between institutions.

The second paper in this series elaborates these points and presents the research team's recommendations in the form of a 'decision-tool' to support jurisdictions, institutions and departments in developing pathways that will support students' needs. Policy has successfully created a pathways framework throughout Ontario; the next stage is to work on making transfer more available, and making transfer easier and rewarding.

What seems clear is that students are relying on the so-called "path of desire". That even though we've 'paved' a way, made it safe by fencing it off, and illuminated it for ease of use, students are choosing instead to forge their own way in pursuing education. An analysis of student transfer patterns provides insights into the types of pathways we may need to consider in future. The second report associated with this study, titled Ontario Student Mobility: A framework and decision making tool for building, addresses these issues.

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Appendix A: List of Critical Friends

The authors are grateful for the considerable time and contribution of many individuals that helped guide our understanding of the practical and policies realities of working with Ontario's credit transfer system, including[5]:

Prof. Tim Brunet
Pathways Coordinator, Liberal Arts & Professional Studies Program Coordinator, University of Windsor

Peter Gooch, PhD
Senior Director, Policy and Analysis, Council of Ontario Universities.

Henry Decock, PhD
Associate Vice President, Centre for Research in Student Mobility, Seneca College.

Cindy Hazel
Professor Emeritus, Seneca College

Susan Kloosterman
Director, Academic Operations and Student Pathways, Fleming College

Rhonda Lenton, PhD
Vice President Academic and Provost, York University

Ursula McCloy, PhD
Research Manager, Centre for Research in Student Mobility, Seneca College

Alice Pitt, PhD
Vice-Provost Academic, York University

Laurie-Anne Rancourt
Associate Vice President, Humber College

Laurel Schollen
Vice President, Academic, Fleming College

Bill Summers
Vice-President, Research and Policy, Colleges Ontario

David Trick, PhD
President, David Trick and Associates Inc.

[5] We are also grateful to others who prefer to remain anonymous

Appendix B: Detailed analysis methods

This section outlines in depth the methods used to analyse the 2013 National Graduates Survey, and to assemble and analyse institutional profiles using ONCAT's database of pathways, and Google Maps. The methods used to derive the number of students using the College Graduate Survey were outlined in the methods section in the main body of the report.

National Graduate Survey data

One of the datasets in this study is from the 2013 National Graduates Survey (NGS) – class of 2009/2010 conducted by Statistics Canada from April 2nd to September 1st, 2013. The survey was designed by Statistics Canada to investigate the links between postsecondary education and labour market. It looks into factors such as students' field of education, their level of qualification and the effects these two factors have on students' employment pathway. The full dataset of NGS 2013 contains 28,715 records and more than 900 original and derived variables. The survey uses a stratified random sample design. The sample of 28,715 graduates was drawn from a population of 431,921 graduates who completed the requirements of an admissible program some time in 2009-10 from a recognized public postsecondary Canadian institution and who were living in Canada or the United States at the time of the survey (with the exception of American citizens living in the United States at the time of the survey) (Stats Canada, 2014). Using the application of a weight variable provided by Statistics Canada, we were able to obtain the weighted estimates for the entire population.

Data mining and management

Given the size of the dataset, we chose SAS to conduct data mining and management. As users external to Statistics Canada, we were required to access this dataset through the Real Time Remote Access (RTRA) system and could only apply the SAS macros prepared by Statistics Canada in advance. All the SAS programs were uploaded through this system to Statistics Canada and the cross tabulation results were returned within one to two hours.

With clear research questions in mind, the team first located the variables of interest from NGS 2013. Then we extracted information by creating frequency cross tabulations by crossing four to five variables at a time. The detailed steps are illustrated in the following sections. As we focused on comparing Ontario to all of Canada, the variable that indicates the locations of postsecondary education institutions that the students graduated from, INSTPRV,6 was applied to all cross tabulations.

Education

One of the purposes of this study is to depict graduates' postsecondary education pathway by examining the postsecondary education qualifications graduates completed in 2009-10 and their prior postsecondary education qualifications---the qualifications graduates completed before 2009-10. The factors we used to describe graduates' qualifications are their field of education

[6] INSTPRV : Province of institution.

and level of qualification. Specifically, we created frequency tabulations of graduates by crossing their prior level of qualification/sector, prior broad field of education, their current level of qualification/sector and current field/subfield of education. Since the team was interested in examining both broad fields of education and specific subfields of education, both the specific level of qualification and students' movement between and within sectors, we modified and derived new variables from the existing NGS variables to better serve our study purposes.

Sector

Students' movement within and between sectors (college and university) is one focus of this study. The team derived the variables, prior sector and current sector, from NGS variable EDBEFOR and CERTLEV. Specifically, the team aggregated two college level qualification, 'Quebec Trade/vocational diploma or certificate' and 'College or CEGEP diploma or certificate', into 'College', and the university level qualification, 'University diploma or certificate below bachelor level', 'Bachelor's degree or first professional degree', 'University diploma/certificate above BA level but below MA', 'Master's degree' and 'Doctorate', into 'University'.

Field of Education

The project analysed graduates' broad fields of education, and we also regrouped the individual instructional programs into subfields of education. The broad fields are Statistics Canada's primary groupings of instructional programs. We used Statistics Canada's broad fields to identify narrower subfields, and we linked subfields depending on their internal coherence and the nature of their links to the labour market.

Statistics Canada reports graduates' qualifications by its classification of instructional programs (Statistics Canada 2012: 11). This classification is at 3 levels.

1 The first level is 'broad field' identified with 2 digit codes. Examples are '01. Agriculture, agriculture operations and related sciences' and '52. Business, management, marketing and related support services'. There are 49 broad fields in the 2011 classification of instructional programs.
2 The second level of Statistics Canada's classification of instructional programs is 'sub field' identified with 4 digit codes. Examples are '01.01 Agricultural business and management' and '52.03 Accounting and related services'. There are 387 subfields.
3 The third and basic level is 'instructional program classes' which have 6 digit codes. Examples are '01.0103 Agricultural economics' and '52.0303 Auditing'. There are 1,688 instructional program classes.

For some purposes Statistics Canada (2012: 15-17) aggregates instructional program classes by a variant of its classification of instructional programs that it calls 'primary groupings' or 'broad field of education'. The graduates' broad field of study before 2009-10 was addressed by the variable named AECC1AG7, and the broad field of study in 2009-10 was under the variable named PR1CAG118. These are shown in Table 14 with the abbreviations used in this report.

[7] AECC1AG: Agg. CIP 2000 completed in Cnd institution before graduation 2009/2010
[8] PR1CAG11: Agg. CIP 2011 at graduation in 2009/2010

Table 14: Statistics Canada's primary groupings

Abbreviation	Primary groupings	Constituent broad field and subfield
Not included in the analysis	00 Personal improvement and leisure	32. Basic skills (not for credit) 33. Citizenship activities (not for credit) 34. Health-related knowledge and skills (not for credit) 35. Interpersonal and social skills (not for credit) 36. Leisure and recreational activities (not for credit) 37. Personal awareness and self-improvement (not for credit)
Ed	01 Education	13. Education
Arts	02 Visual and performing arts, and communications technologies	10. Communications technologies/technicians and support services 50. Visual and performing arts
Hum	03 Humanities	16. Aboriginal and foreign languages, literatures and linguistics 23. English language and literature/letters 24. Liberal arts and sciences, general studies and humanities 30.13 Medieval and renaissance studies 30.21 Holocaust and related studies 30.22 Classical and ancient studies 30.29 Maritime studies 38. Philosophy and religious studies 39. Theology and religious vocations 54. History 55. French language and literature/letters
Soc sci	04 Social and behavioural sciences and law	05. Area, ethnic, cultural, gender, and group studies 09. Communication, journalism and related programs 19. Family and consumer sciences/human sciences 22. Legal professions and studies 30.05 Peace studies and conflict resolution 30.10 Biopsychology 30.11 Gerontology 30.14 Museology/museum studies 30.15 Science, technology and society 30.17 Behavioural sciences 30.20 International/global studies 30.23 Intercultural/multicultural and diversity studies 30.25 Cognitive science 30.26 Cultural studies/critical theory and analysis 30.28 Dispute resolution 30.31 Human computer interaction 30.33 Sustainability studies 42. Psychology 45. Social sciences
Bus	05 Business, management and public administration	30.16 Accounting and computer science 44. Public administration and social service professions 52. Business, management, marketing and related support services
Phys sci	06 Physical and life sciences and technologies	26. Biological and biomedical sciences 30.01 Biological and physical sciences 30.18 Natural sciences 30.19 Nutrition sciences

Abbreviation	Primary groupings	Constituent broad field and subfield
		30.27 Human biology
		30.32 Marine sciences
		40. Physical sciences
		41. Science technologies/technicians
Info sci	07 Mathematics, computer and information sciences	11. Computer and information sciences and support services
		25. Library science
		27. Mathematics and statistics
		30.06 Systems science and theory
		30.08 Mathematics and computer science
		30.30 Computational science
Eng	08 Architecture, engineering, and related technologies	04. Architecture and related services
		14. Engineering
		15. Engineering technologies and engineering-related fields
		30.12 Historic preservation and conservation
		46. Construction trades
		47. Mechanic and repair technologies/technicians
		48. Precision production
Ag	09 Agriculture, natural resources and conservation	01. Agriculture, agriculture operations and related sciences
		03. Natural resources and conservation
Health	10 Health and related fields	31. Parks, recreation, leisure and fitness studies
		51. Health professions and related programs
		60. Dental, medical and veterinary residency programs
Pers serv	11 Personal, protective and transportation services	12. Personal and culinary services
		28. Military science, leadership and operational art
		29. Military technologies and applied sciences
		43. Security and protective services
		49. Transportation and materials moving
Other	12 Other	21. Pre-technology education/pre-industrial arts programs
		30.99 Multidisciplinary/interdisciplinary studies, other
		53. High school/secondary diploma and certificate programs

This report adopts Statistics Canada's primary groupings for many purposes, including the categorization of qualifications that graduates had before their graduation in 2009-10. However, the report seeks to analyze in detail the prior qualifications of graduates of programs in 2009-10 that lead to specific occupations such as doctor, lawyer and nurse. But doctor and nurse qualifications are included in the same primary group '10 Health and related fields' and in the same broad field '51. Health professions and related programs' with many qualifications leading to other occupations. Likewise lawyer qualifications are included in the primary group '04 Social and behavioural sciences and law' which includes many qualifications that do not lead to legal practice. Even the broad field '22. Legal professions and studies' includes many programs that do not lead to legal practice.

The team therefore developed a new aggregation of 6 digit instructional program classes to group those qualifications that seem homogenous on the characteristics of interest to the report. We have referred to these as 'subfields' to differentiate them from Statistics Canada's 'broad

fields'. Besides 'nursing practical' and 'registered nurse', the rest of the 6 digit instructional program classes were coded under the variable named PR1CIP11, which is shown in Table 15.

Table 15: composition of research team's subfields derived from Statistics Canada's categories

Subfields	Statistics Canada's categories
Business	52. Business, management, marketing and related support services except: 52.0401 Administrative assistant and secretarial science, general 52.0402 Executive assistant/executive secretary 52.0406 Receptionist 52.0407 Business/office automation/technology/data entry 52.0408 General office occupations and clerical services 52.0409 Parts, warehousing and inventory management operations 52.0410 Traffic, customs and transportation clerk/technician 52.0411 Customer service support/call centre/teleservice operation 52.0499 Business operations support and assistant services, other
Education other	13.01 Education, general 13.02 Bilingual, multilingual and multicultural education 13.03 Curriculum and instruction 13.04 Educational administration and supervision 13.05 Educational/instructional media design 13.06 Educational assessment, evaluation and research 13.07 International and comparative education 13.09 Social and philosophical foundations of education 13.11 Student counselling and personnel services 13.99 Education, other
Education teacher	13.10 Special education and teaching 13.12 Teacher education and professional development, specific levels and methods 13.13 Teacher education and professional development, specific subject areas 13.14 Teaching English or French as a second or foreign language
Engineering practitioner	14. Engineering except those categorized as technician
Health medical assisting	51.08 Allied health and medical assisting services 51.09 Allied health diagnostic, intervention and treatment professions
Humanities	16. Aboriginal and foreign languages, literatures and linguistics 23. English language and literature/letters 24. Liberal arts and sciences, general studies and humanities 38. Philosophy and religious studies 39. Theology and religious vocations 54. History 55. French language and literature/letters
Human services	44.00 Human services, general 44.02 Community organization and advocacy 44.04 Public administration 44.05 Public policy analysis 44.07 Social work 44.99 Public administration and social service professions, other
Law practitioner	22.01 Law (LLB, JD, BCL) 22.02 Legal research and advanced professional studies (post-LLB/JD)
Medicine	51.12 Medicine (MD) 51.19 Osteopathic medicine/osteopathy (DO) 60.04 Medical residency programs - general certificates 60.05 Medical residency programs - subspecialty certificates

Subfields	Statistics Canada's categories
	60.06 Podiatric medicine residency programs 60.99 Dental, medical and veterinary residency programs, other
Nurse practical	51.3901 Licensed practical/vocational nurse training (LPN, LVN, RPN, Cert., Dipl., AAS) 51.3999 Practical nursing, vocational nursing and nursing assistants, other
Nurse registered	51.38 Registered nursing, nursing administration, nursing research and clinical nursing, except: 51.3802 Nursing administration (MSN, MS, MScN, MSc, PhD) 51.3808 Nursing science (MS, MSc, PhD) 51.3817 Nursing education 51.3899 Registered nursing, nursing administration, nursing research and clinical nursing, other
Physical and life sciences	26. Biological and biomedical sciences 40. Physical sciences
Social sciences	05. Area, ethnic, cultural, gender, and group studies 09. Communication, journalism and related programs 19. Family and consumer sciences/human sciences 42. Psychology 45. Social sciences
Technician	15.00 Engineering technology, general 15.01 Architectural engineering technology/technician 15.02 Civil engineering technology/technician 15.03 Electrical and electronic engineering technologies/ technicians 15.04 Electromechanical and instrumentation and maintenance technologies/ technicians 15.05 Environmental control technologies/technicians 15.06 Industrial production technologies/technicians 15.07 Quality control and safety technologies/technicians 15.08 Mechanical engineering related technologies/ technicians 15.09 Mining and petroleum technologies/technicians 15.10 Construction engineering technology/technician 15.11 Engineering-related technologies 15.12 Computer engineering technologies/technicians 15.12 Computer engineering technologies/technicians 15.13 Drafting/design engineering technologies/technicians 15.14 Nuclear engineering technology/technician 15.15 Engineering-related fields 15.16 Nanotechnology 15.99 Engineering technologies and engineering-related fields, other 41. Science technologies/technicians 47. Mechanic and repair technologies/technicians
Trade	46. Construction trades 48. Precision production

Discrepancies in the data that were noted, came largely from the Nurse practical and Registered nurse subfields. The team first identified problems in the coding of the nursing subfields when results from PR1CIP11 indicated that there were less than 1000 registered nurses across Canada; this number did not seem to be a true reflection of the national population of those within the nursing profession. Working with Statistics Canada, the team later discovered that the nursing subfields of education were all coded under a different variable than the other subfields. In

contrast to the rest of subfields that were regrouped from the variables named PR1CIP11, the two nursing subfields, nurse registered and nurse practical, were coded under a different variable named PRCIP1[9].

Nurse registered: 51.1601 Nursing/Registered Nurse (RN, ASN, BScN, MScN)

Nurse practical: 51.1613 Licensed Practical/Vocational Nurse Training (LPN, LVN, Cert., Dipl., AAS)

Confidence Intervals

The use of the RTRA system to access the NGS 2013 survey data comes with two important limitations for the determination of our results' confidence intervals.

The first limitation is that we could not compute the standard errors associated with the data. Normally, when querying for results, we would be able to put an additional request for the standard errors, from which we could calculate our confidence intervals. The RTRA system, however, does not give users direct access to its data sets and forbids users from running customized SAS programs to calculate standard errors. Instead, we were provided with the Approximate Sampling Variability Tables for typical population proportions. The NGS 2013 User Guide PUMF (Statistics Canada, 2014) makes it clear that the confidence interval can be calculated from the Approximate Sampling Variability Tables by first determining the coefficient of variation of the estimates from the appropriate table. It also provides users with the formula of calculating 95% confidence interval of the estimate $\hat{X}$ with its coefficient of variation $\alpha_{\hat{x}}$:

$$95\%CI_{\hat{x}} = \left(\hat{X} - 2\hat{X}\alpha_{\hat{x}}, \hat{X} + 2\hat{X}\alpha_{\hat{x}}\right)$$

where $\hat{X}\alpha_{\hat{x}}$ equals to the standard error of $\hat{X}$

The fact that the Approximate Sampling Variability Tables only cover limited situations and proportions restricts us from calculating precise confidence intervals, but we are nevertheless able to arbitrarily estimate confidence intervals from these values. Working with limited information, the team is only able to provide quite conservative estimates, therefore the range of the confidence intervals we calculated would be much wider than it actually should be.

To better convert coefficients of variation to confidence intervals, we created standard error tables for Ontario and Canada respectively based on the Approximate Sampling Variability Tables and the formula. As the standard error steadily increases up to 50%, then symmetrically decreases, the coefficient of variation at 10% is same to that at 90%; the coefficient of variation at 20% is same to that at 80% and so on. The standard errors were calculated every ten per cent.

However, one thing we should bear in mind is that based on the instructions from the User Guide any coefficients of variation fall between 16.6% and 33.3% should be used with caution and those greater than 33.4% are not acceptable. We followed the instructions when converting coefficients of variation into confidence intervals and concluded that

In tables of Canada, the result is interpretable if

[9] PRCIP1: CIP 2000 at graduation in 2009/2010

The subsample is about 1000 and the per cent is between 40% and 60%, or
The subsample is about 5000, and the per cent is between 20% and 80%, or
The subsample is greater than 5000;

In tables of Ontario, the result is interpretable if
The subsample is about 5000 and the per cent is between 20% and 80%, or
The subsample is greater than 5000;

The accuracy of our analyses was admittedly compromised by these limitations. However, the figures still roughly tell the tendency of students' movements in postsecondary sector. Therefore, instead of presenting accurate numbers, this paper is only aimed to report major and general trends and trajectories.

Institutional profiles

To get a sense of the current landscape of existing transfer articulation within Ontario postsecondary education, institutional profiles of each Ontario postsecondary institution were derived. Institutional profiles were constructed for all 22 publicly funded universities and 24 publicly funded colleges. Institutional profiles for each university can be found in Appendix C and for each college in Appendix D. Each institutional profile depicted the institution as a receiver of transfer students. Each institutional profile summarized pathways of the receiving institution by sending program. For university institutional profiles, pathways were further analysed by sending institution. This table was not produce for the college institutional profiles, as student data available only allowed us to analyse universities as receivers of students. As the breadth of data available allowed for more detailed analysis of college transfer students to universities, the focus of much of the discussion in the main report will centre on student college-to-university transfer pathway. More detail regarding each pathway analysis approach can be found within each institutional profile. Broadly, of interest were the following lines of inquiry:

1) What receiving pathway agreements did public universities and colleges have with their sending partners?
2) Were these receiving pathways for specific qualifications and fields of education, or for generic pathways that did not specify the field of education of the sending and receiving qualification?
3) How geographically close were the pathway partners and thus how practical were articulated pathways?
4) Can college-to-university student transfer data elucidate how heavily pathways are being used?

The following sub-sections will outline data-sources used in institutional profile development.

ONCAT Pathway Articulation Dataset (obtained July, 2015).

The team first obtained a comprehensive dataset outlining all articulation agreements of Ontario post-secondary institutions from the Ontario Council of Articulation and Transfer (ONCAT). The following lists the available variables found with the dataset:

Pathway and Credit Variables	Sending Institution Variables	Receiving Institution Variables
Pathway ID	Sending Institution	Receiving Institution
Agreement Status	Sending Program Discipline	Receiving Institution Program Discipline
Archive Reason	Sending Program Area	Required GPA
Pathway Category	Sending Credential	Minimum grade
Pathway Type	Sending Program Title	Other Eligibility Criteria
Implementation Date	Graduated from the program at Sending Institution	Number of semesters to complete
Expiry Date		Credentials to be granted
Title of Pathway		Receiving Institution Credential
Terms for renewal or cancellation		Receiving Institution Program Area
Contact Procedure		Receiving Institution Program Title
Eligibility for the Pathway		Date of approval by receiving institution
Credit Transfer		Receiving Institution Approving Party Names
Number of transfer credits to be granted at receiving institution		Credits that must be achieved at Receiving Institution
Anticipated time to complete		Summarized Credits that must be achieved at Receiving Institution

Examining only approved, current articulation agreements (as relayed to ONCAT prior to July 2015), the team constructed pivot tables in Microsoft Excel 2011 to examine the nature of approved sending agreements for all publicly funded institutions in Ontario. Within the MS Excel PivotBuilder, the following variables were placed under row labels: “Sending program discipline”, “Sending program title”, and “Sending institutions”. Under column labels, the team placed the variable “Receiving institutions”. “Count of pathway ID” was placed under “Values”, to show the number articulated agreements in existence between all sending institutions and the selected receiving institution. Of interest were not only the number of approved agreements, but also whether the kinds of pathways that were articulated were either “generic” or “specific”. The team coded “generic” pathways as a pathway that articulated transfer from a non-specific sending program, and specific” pathways were pathways that articulated transfer from a discipline-specific sending program. On the conceptualization of “generic” and “specific” pathways, it is important to make some distinctions about the language and counts used in the reports. Our team wanted to approach the transfer pathway analysis not from an institutional perspective, but from a student perspective. The research questions which underpinned this conceptualization were: what pathways are available to students should they wish to transfer from college to university, and would field of study matter? So to draw some comparisons of meaning, pathways as understood by institutions as multi lateral systems pathways agreements,

were coded as “generic pathways” for students. Meaning regardless of prior of field of study, as long as they had a credential (i.e. any 2 year of 3 year diploma) these would be the available routes for them at the receiving institution. Bilateral, direct entry programmes, were considered “specific pathways”. Meaning for college students to use an articulated business transfer pathway at the receiving institution, they would have to have had a previous credential in business.

Institutions within our purview were individually selected as receiving institutions, and the data tables derived from the developed Pivot tables were pulled and incorporated into profiles of each institution. The research team then consulted with institutions to provide feedback of the profiles developed, to ensure representativeness. Though the team contacted all 22 publicly funded universities and 24 publicly funded colleges, only 13 responded with feedback. As well, not all institutions regularly updated ONCAT with their most recent articulated transfer agreements. Thus data portrayed within institutional profiles may not reflect the most recent portrait of transfer pathways offered. The study is therefore limited to just the data made available through ONCAT, and the feedback received from institutional partners through the consultation process.

Geographical proximity data

In line with question 3, the team was interested in understanding how feasible these pathways were for students to follow by commuting from their initial institution. Distances (in kilometres) and commuting time (in hours) between sending and receiving institutions were calculated with a Google distance calculator programmed by Winfred van Kuijk, which used Google Maps API software. After entering in the addresses of institutions, the team derived institution matrices of distances (in km) and commuting distances (in hours) and exported the matrices into an MS Excel file. Informed by previous work done by Frennette (2003), reasonable commuting parameters were considered around 80 km or 1 hour commuting time. Institutions have multiple campuses, so to analyse proximity, the team chose the campus the institution designated as its main campus, and if this wasn’t specified, the campus which hosted the most students or offered the most programs. This is a limitation of the study since smaller campuses may be distant from the main campus.

Student transfer data: 2013/2014 Ontario College Graduate Satisfaction Survey

Student transfer data were gathered as a secondary analysis from a study performed by colleagues at Seneca College, which used the 2013/2014 Ontario College Graduate Satisfaction Survey (GSS). Broadly, the Graduate Satisfaction Student Survey details graduates’ satisfaction with their college education in achieving their goals after graduation, whether it be in securing future employment or in continued education (McCloy & Liu, 2010). Data received from Seneca colleagues summarized 2013-14 Ontario CAAT/college graduates who reported attending university full or part time and enrolled in any credential six months after graduation. Around half of college graduates responded to the GSS. The team assumed that non respondents had the same characteristics as respondents and so doubled the number of students who reported transferring to estimate the total population of transferring students. We recognise this is a somewhat ‘rough and ready’ calculation, but we were interested in trajectories rather than precise numbers. Moreover, this is the only data that is readily accessible, until data from the Ontario Education Number is available for researchers to explore. From the estimated total number of student transfers the team calculated an approximate “student-per-pathway” ratio to

illustrate the magnitude of student traffic per pathway agreement. The research team understands that the “student-per-pathway” ratios may not reflect an accurate reality of transfer student numbers for institutions, as the data is limited by virtue of secondary analysis, as well as recoding of an open ended “other” field as performed by Seneca colleagues. It is therefore important to stress that the estimated number of total transfer students and the approximate ratios of graduate per pathway may not reflect accurately actual graduates per pathway. The data will therefore be used only to suggest trends in transfer student mobility.

Appendix C: Partnership profiles (Colleges)

In a separate document

Appendix D: Partnership profiles (Universities)

In a separate document