



ADVANCING STUDENT TRANSFER THROUGH ENHANCED DATA EXCHANGE

ONCAT Funded Data Exchange Study

Project led by: Association of Registrars of the Universities and Colleges of Canada (ARUCC)



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Executive Summary

The research and this report explore the practices and potential opportunities for improving transfer and mobility by enhancing digitization and exchange of students' official academic credentials, transcripts, and documents. It summarizes the findings from a comprehensive study of data exchange practices and perspectives at post-secondary institutions and their partners in Ontario conducted in the summer, fall, and winter of 2018/19.

The impetus for this research stems in part from broader efforts to create a national student data exchange network. Called the *ARUCC Groningen Project*,¹ the goal of that larger initiative includes enabling students to move seamlessly into and between Canadian post-secondary institutions and into the workforce by improving official credential, transcript, and academic document exchange. These aspirations directly align with the Ontario Council on Articulation and Transfer's (ONCAT) stated intention of understanding and removing systemic barriers that impede seamless transfer.

Research Questions

The project explored the following primary and secondary research questions:

- 1. What broader context, current practices, and associated gaps face Ontario post-secondary institutions with respect to student data exchange?
- 2. What recommendations do Ontario post-secondary registrarial leadership and supporting organizations have for advancing institutional capacities and change readiness for data exchange to advance transfer?
- 3. Sub-research questions:
 - a) Are there any notable exemplars to help guide change?
 - b) What benefits will result from a national network to advance seamless inter- and intraprovincial transfer for Ontario post-secondary institutions and their students?

For the purposes of this project, transfer encompasses that which occurs when students move between post-secondary institutions both within Canada and internationally. Mobility focuses on easing students' access to funding and transition into regulatory professions, trades, and the workforce by enhancing trusted sharing of official academic documents with other third parties.

Research Approach

A multi-layered approach guided the research to address the above questions. An environmental scan including literature and website reviews provided the context and an opportunity to identify promising practices. The next stage of primary research involved three components: a national bilingual (French, English) survey, qualitative interviews, and inter-institutional regional meetings. The national scope of the research provided opportunities to compare Ontario findings to other jurisdictions. The target audience for the primary research included registrarial and data exchange leaders at colleges, institutes, and universities and other supporting organizations across Canada including application centres and the seven councils on articulation/admissions and transfer. An external evaluator, Joanna Pesaro, supported the research process through all its various stages. Appendix A contains her summative report.

The national, bilingual survey collected 117 responses from 86 public and private post-secondary institutions and experienced an 85% completion rate. Of these, respondents from 76 publicly funded

¹ <u>http://arucc.ca/en/projects/task-force-groningen.html</u>

institutions participated, which represents 37% (76/204) of the total pool of Canadian public postsecondary institutions. For Ontario, respondents participated from 53% (24/45) of the publicly funded institutions, the Ontario Council on Articulation and Transfer (ONCAT), and the two application centres (OCAS - the Ontario college application service; Ontario Universities' Application Centre - OUAC). Of the 24 institutions, 42% represented colleges/institutes (10/24) and 67% represented universities (14/21).

The research process benefitted from the participation of registrarial leaders representing each of the 45 publicly funded post-secondary institutions in Ontario and from the partnering support of the Ontario College Committee of Registrars, Admissions, and Liaison Officers (CRALO) and the Ontario University Registrars' Association (OURA). These two organizations formally endorsed this research and the national *ARUCC Groningen Project*. In addition to the above, interviews occurred with the leadership and staff at ONCAT, OCAS, and OUAC.

In total, the researcher consulted with more than 270 people both in Ontario and across Canada in the interviews and regional meetings (see Appendices B, C, and D for specific organizations contacted). Included in this total are those that participated in 11 inter-organizational regional meetings involving 231 people, of which ten were delivered in Ontario. Some of these were delivered virtually; however, most occurred in person and included meetings in the following regions: Toronto, Durham (virtually), Ottawa, Sudbury, and Kitchener-Waterloo. Fifteen organizationally specific interviews occurred with staff from ONCAT, OCAS, OUAC, and six colleges and six universities from Ontario. The post-secondary institutions involved reflect the diversity that exists in the province across several dimensions such as type of institution, the range of credentials offered, enrolment size, sector affiliation, linguistic focus, and geographical location (Figure 1). A student focused consultation meeting occurred with representatives from the three Ontario student groups, which included the Canadian Federation of Students (CFS), the College Student Alliance, and the Ontario Undergraduate Student Alliance (OUSA).

The collaborative approach to engaging the Ontario higher education community in the consultation research process for this project represented a core strength and was necessary due to its complexity. It would not have been possible to conduct this study without this full participation; therefore, gratitude is extended to all these people for their expertise and support.

Figure 1: Diversity of Post-secondary Institutions and Organizations Interviewed in Ontario



Data Limitations

The primary challenge impacting the project was the lack of data available regarding the scope of provincial and national transfer, mobility, and document exchange. Improving these gaps would be important to fully understand the trends and volumes and subsequent pressures. For example, transfer in Ontario includes intra-provincial, national, and international learners; therefore, identifying the volumes and trends across all these cohorts would better serve post-secondary institutions, future policy development, and other research projects. Most research and analysis tend to focus on specific transfer communities within a province, limiting the potential for fully understanding and addressing needs.

Increasing applications, enrolments, and graduations are driving requests for a host of services across the entire student life cycle. Given the above-mentioned data gap, proxy indicators undergird the findings and subsequent recommendations. These include the growth in document and identity fraud, international students, and requests for official outgoing document validation to support students accessing funding, opportunities to study in Canada, and the workforce. The transfer volumes are identified to the extent the publicly available data allows. The report provides specific examples of these and other change drivers in Section 3.0.

Rationale for Change

Post-secondary institutional representatives raised concerns regarding growing document and identity fraud in most of the interviews and regional meetings conducted for this project. They indicated that providing trusted exchange of incoming and outgoing academic documents supports quality assured practices and helps to maintain the Canadian higher education brand.

Many also cited the increasing volume pressures which they indicated were adversely affecting service. As an illustrative example, Canadian post-secondary institutions have seen a 47% increase from 2015 to 2018 in international student study permits granted by the federal government. In 2018, Ontario bound international students represented 64% of the overall volume. Other data indicates most of these students are coming from countries such as China, India, South Korea, France, and the United States. At least four of these regions maintain trusted institutionally supported and/or government mandated official credential repositories. If Canadian post-secondary institutions connected electronically to these entities through a national network for the purpose of official academic document exchange, the improvements to international admissions and transfer processing would be enormous, as would the reduction in the potential for document fraud. At minimum, staff would no longer need to verify the official nature of a document or its source. The report shares other indicators in Section 3.0 that demonstrate the need for better methods for document exchange that leverage technology.

Challenges and Gaps

To address the first research question, Section 4.0 provides an overview of the current data exchange capacities at Ontario post-secondary institutions and beyond. The findings suggest the lack of electronic exchange of academic documents presents challenges for transfer and mobility. Potential risks include reduced student service (e.g., quality, timeliness), impediments to efficiency for both students and institutions, and untimely decisions including those related to transfer credit allocations. Unfortunately, document and identity fraud represent additional concerns. The research revealed several gaps in Ontario including the following: (i) insufficient connectivity with recognized institutions and trusted credential repositories across Canada and internationally, (ii) a lack of capacity within institutions to automatically assess transcripts, even those that arrive electronically, resulting in manual document assessment, and (iii) growing demands to officially verify incoming and outgoing documents (e.g., documents required for admissions and transfer, offers of admission, and confirmations of enrolment, fees paid, pending graduation, and graduation).

For the first gap, students applying from outside of Ontario submit documents by mail or in-person that staff subsequently hand review, evaluate, and assess manually for both admissions and transfer credit. Institutions typically verify these documents with former institutions, a process that takes time. With respect to the second gap, not all institutions are able to identify the transfer equivalencies awarded at the point of making an offer. This happens for a host of reasons including a lack of trusted official academic document exchange, program specific policies and practices that impede automation of processes, resource limitations, and internal institutional prioritization practices related to technology projects. While some of these areas fall outside of the scope of this project, it is important to understand their inter-relationship and impact on best practice to identify awarded transfer equivalencies at the point of making an offer as it is a time of key decision making for students; therefore, it is important for institutions to enhance capacities in this area. The third gap results from increasing requests for official verification of documents. These likely result from growing concerns about document and identity fraud.

Exemplars

To address the research question focused on identifying potential exemplars, the report highlights international and Canadian application centres and data hubs that offer access to trusted electronic academic results (Section 3.0). These represent potential partners for a national data exchange network for Ontario post-secondary institutions. Most of the Canadian ones, including those in Ontario, focus primarily on exchange of academic credentials within their respective regions to support application into local post-secondary institutions. Some, including OUAC and OCAS, have made initial forays into establishing connectivity across borders. However, the research indicates there are many international regions where the centralized credential repositories exist for ensuring official academic document

verification and exchange in support of student's transferring between post-secondary institutions and beyond. The report highlights promising exemplars to inform next steps and possibilities.

With respect to the aforementioned data limitations affecting this project, exemplar models to consider to improve data collection include the work of the Maritime Provinces Higher Education Commission (MPHEC),² British Columbia's Student Transition Project,³ Burbidge and Finnie's (Burbidge & Finnie, 2000) earlier research regarding Canadian post-secondary student mobility, and the transfer and mobility research of the US-based National Student Clearinghouse (the *Clearinghouse*). Through the latter organization's Research Centre,⁴ institutions access extensive regional and national level transfer and mobility data. The *Clearinghouse* offers its members national data exchange and verification services to thousands of institutions, secondary schools, and students. It represents an exemplar model for the future Canadian national data exchange network contemplated by the *ARUCC Groningen Project*. Other exemplars related to better understanding the volume of student movement and perspectives include the recent transcript exchange volume study conducted by ONCAT and OCAS with OUAC's support (Weins & Fritz, M., 2018) and OUSA's student-led study of 1,300 transfer students (2017).

Recommendations

The last research objective included identifying recommendations for moving forward with the establishment of a national data exchange network to support efficiencies as student move into, between, and beyond Canadian post-secondary institutions. The core benefits cited included improvement opportunities for efficiency, transfer, and learner mobility.

The Ontario post-secondary institutions had previously and formally voted at the 2019 ARUCC annual meeting to continue developing a national student data exchange network to support both domestic and international students.⁵ None during the Ontario consultation disagreed with this position. Therefore, the recommendations from the Ontario higher education community in Section 6.0 provide specific suggestions on how to implement the national data exchange network. The following represent a thematic sampling:

- Ensure the network addresses top priority needs
 - For Ontario, the participants identified improving service, enhancing efficiencies for students and institutions, and mitigating document fraud by establishing trusted, official academic document exchange. The community advised that successfully establishing a national data exchange network requires a prioritized focus on developing the capacity to serve learner transfer and mobility across institutions.
- Ensure adherence to privacy regulations and other relevant statutes
- Help institutional registrarial and technology leaders at post-secondary institutions to obtain support from provosts and presidents for the national data exchange network (i.e., through system wide advocacy and project endorsement efforts)
- Seek out project funding from governments, partners, post-secondary institutions, and others to set up the network

² <u>http://www.mphec.ca/research/trendsmaritimehighereducation.aspx</u>

³ <u>https://www2.gov.bc.ca/gov/content/education-training/post-secondary-education/data-research/student-transitions-project</u>

⁴ <u>https://nscresearchcenter.org/</u>

⁵ <u>http://arucc.ca/en/projects/task-force-groningen.html</u>

- Consult further with the post-secondary institutions regarding the operating structure and governance framework for the national network and ensure support for provincial and institutional diversity, autonomy, and authority
- Carefully consider and adopt cost recovery revenue models when creating the national data exchange network
- Ensure front-facing components and data exchange capacities support Canadian bilingualism
- Establish a phased implementation plan
 - The community provided extensive implementation suggestions which are captured in the report.
- Provide support for onboarding Canadian post-secondary institutions and application centres to the network

Enhancing Student Transfer and Mobility through Trusted Data Portability

The Ontario research validates the conclusion previously reached by the community that creating a national student data exchange network represents a viable next step to support Canadian higher education and student transfer and mobility. The findings suggest that tying accessible student data portability to learner mobility needs to be a strategic intention supported by the highest levels of leadership. While there are many competing priorities, Ontario post-secondary institutions are well positioned to both benefit from and contribute to a national student data exchange network.

The research indicates that the various aspects of registrarial service delivery consider both the academic and student needs at the core of the activities; however, the registrarial community signalled more is needed as the institutions and students require greater speed, transparency, efficiency, and coherence. Providing trusted connections to facilitate seamless and direct electronic academic document exchange (e.g., transcripts, credentials, confirmations of status) from across Canada and internationally represents an important first step. Supporting further automation and scalable practices within institutions by using electronic student information and next generational technology to reduce burdens on students represents an important next step which will be well served by enhancing official student document exchange. While changing internal institutional practices sits outside the scope of this project, further research is encouraged to assist institutions with identifying ways to enhance internal processes as these relate to automation to support student transfer and mobility.

With respect to Ontario, additional research and consultation are recommended to help develop the connectivity to a national data exchange network. Important next steps include (i) identifying a service provider, (ii) creating a model for exchange that works for the context and diversity that exists in Ontario, and (iii) identifying pilot institutions with which to partner on specific data exchange projects.

These findings will be of use to ONCAT, the post-secondary community, and ARUCC as they collaborate to create better supports for students and institutions. Furthermore, the report will inform policy development and resource prioritization discussions related to transfer and student mobility.

The national network holds the promise of ensuring quality assured, official electronic exchange of students' academic credentials, transcripts and documents through trusted connections. With growing volumes juxtaposed against resource constraints, new and more scalable methods that embrace trusted and secure connectivity, technology, and different approaches to service delivery are not easily achieved but hold the promise of addressing core challenges. The findings from this Ontario research indicate a

national student data exchange network collaboratively built and coordinated holds the promise of meeting students in their space and supporting their long-term educational journey as they move into or between institutions and into the workforce.

The findings from this Ontario research indicate a national student data exchange network to support official electronic academic document sharing that is collaboratively built and coordinated holds the promise of meeting students in their space and supporting their long-term educational journey as they move into, between, and beyond Canadian post-secondary institutions.

Acronyms

Acronym	Full Title
AARAO	Atlantic Association of Registrars and Admissions Officers
ACAT	Alberta Council on Admissions and Transfer
ARUCC	Association of Registrars of the Universities and Colleges of Canada
BCCAT	British Columbia Council on Admissions and Transfer
CFS	Canadian Federation of Students
CanPESC	Canadian Post-secondary Electronic Standards Council User Group
CATNB	Council for Articulations and Transfer, New Brunswick
CiCan	Colleges and Institutes Canada
CICIC	Canadian Information Centre for International Credentials
CMEC	Council of Ministers of Education, Canada
CRALO	Ontario College Committee of Registrars, Admissions, and Liaison Officers
CUCCIO	Canadian University Council of Chief Information Officers
EducationPlannerBC	BC institutions' application service
GDN	Groningen
MPHEC	Maritime Provinces Higher Education Commission
NSCAT	Nova Scotia Council on Articulation and Transfer
OCAS	OCAS Inc., Ontario colleges' application service
ONCAT	Ontario Council on Articulation and Transfer
OUAC	Ontario Universities' Application Centre
OUCA	Ontario University Council on Admissions
OURA	Ontario University Registrars' Association
OUSA	Ontario Undergraduate Student Alliance
PCCAT	Pan-Canadian Consortium on Admissions and Transfer
PESC	Post-Secondary Electronic Standards Council - US Based
WARUCC	Western University Association of Registrars of the Universities and Colleges of
	Canada

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Section 1.0 – Introduction to the Project

Advancing Student Transfer through Enhanced Data Mobility, an ONCAT funded project, sought to gauge the readiness of Ontario's post-secondary sector to implement trusted student data exchange in support of transfer and mobility. Joanne Duklas, the primary investigator and author of this final report, led the research for the Association of Registrars of the Universities and Colleges of Canada (ARUCC), a national registrarial organization.

The project benefitted from the endorsement and support provided by two partnering organizations; the Ontario College Committee of Registrars, Admissions and Liaison Officers (CRALO) and the Ontario University Registrars' Association (OURA). Registrarial leadership from these two organizations represent the recognized public colleges and universities in Ontario. An external evaluator, Joanna Pesaro, provided her expertise to support the research and final report. Appendix A contains her final summative assessment of the research process.

The project's goals included identifying the current state and readiness for exchanging individual student data and capturing expert advice on the changes and supports needed to facilitate scalable change for transfer. ARUCC aspires to use the findings to achieve the following:

- identify enhancements for student data exchange at the institutional and provincial levels;
- provide research that will be of use to other ONCAT initiatives and projects seeking to advance transmission of learning outcomes achievement and related academic documents to improve transfer; and,
- inform policy development and resource prioritization for student data exchange.

These goals and aspirations directly align with ONCAT's stated intention of understanding and removing systemic barriers that impede seamless transfer. The findings are relevant for ARUCC, which is leading a multi-year, broad-scale project focused on creating a national student data exchange network to facilitate transfer and mobility. This initiative is called the *ARUCC Groningen and Student Mobility Project* (referred to in this report as the *ARUCC Groningen Project*).⁶ It is being conducted in partnership with the Pan-Canadian Association of Admissions and Transfer (PCCAT),⁷ the Canadian University Council of Chief Information Officers (CUCCIO),⁸ and the Canadian Post-Secondary Electronic Standards Council User Group (CanPESC).⁹ ONCAT staff are members of PCCAT and several CRALO and OURA registrars are members of ARUCC. The impetus for this research resulted from preliminary discussions with both the national and provincial groups and post-secondary institutions, which indicated the need for more research of practices and complexities within Ontario institutions to inform changes in the area of student data exchange as these relate to transfer.¹⁰

⁶ <u>http://arucc.ca/en/projects/task-force-groningen.html</u>

⁷ See <u>https://pccatweb.org/pccat/</u> - members include representatives from Canadian colleges, institutes, and universities

⁸ See <u>https://www.cuccio.net/en/</u> - Note: a similar national association for colleges and institutes does not exist at the present time.

⁹ See <u>http://www.pesc.org/canadian-pesc-user-group.html</u> - members include representatives from Canadian colleges, institutes, and universities

¹⁰ The ONCAT research study and the *ARUCC Groningen Project* represent two of three student data exchange projects being led simultaneously by ARUCC. The third is a project in British Columbia that is similar to the ONCAT project although it focuses on understanding the student data exchange context within that province with funding provided by the British Columbia Council on Admissions and Transfer (BCCAT). The BC project is being conducted in partnership with the University of Victoria.

The *ARUCC Groningen Project* and this Ontario project serve broader international goals including supporting the strategic aspirations of institutions and organizations such as Colleges and Institutes Canada and Universities Canada, to increase the participation of in-bound international students studying in Canada and out-bound students seeking to study abroad.¹¹ Internationally, this proposal aligns with the Lisbon Recognition Convention (LRC)¹² and the Groningen Network Organization (GDN).¹³ Both initiatives seek to improve student access to post-secondary education and subsequent mobility by enhancing quality assured recognition of prior post-secondary studies. The GDN focuses specifically on advancing digitization and trusted student data exchange as means to improve student and cultural mobility.

Sections 1.0 and 2.0 introduce the project and outline the approach which was guided by the following research questions:

- 1. What broader context, current practices, and associated gaps face Ontario post-secondary institutions with respect to student data exchange?
- 2. What recommendations do Ontario post-secondary registrarial leadership and supporting organizations have for advancing institutional capacities and change readiness for data exchange to advance transfer?
- 3. Sub-research questions:
 - a) Are there any notable exemplars to help guide change?
 - b) What benefits will result from a national network that advance seamless inter- and intraprovincial transfer for Ontario post-secondary institutions and their students?

Sections 3.0 to 5.0 provide the detailed findings and Sections 6.0 and 7.0 contain the recommendations from the higher education community and concluding remarks.

Examples of organizations engaging in promising practices beyond Ontario are noted in Section 3.0. One illustrative model involves the *China Higher Education Student Information and Career Center* (CHESICC) which is government mandated as the official source for most of the Chinese students' academic results (e.g., secondary credentials, Gaokoa results, etc.).¹⁴ McGill University established Canada's first connection to CHESICC via the National Student Clearinghouse, an American not-for-profit organization that provides national data exchange and research supports to post-secondary institutions south of the border and around the world. In this example, students from China provide permission for CHESICC to send their official academic results directly to McGill. Service enhancements, speed, processing efficiencies, reduced workload, and reduced fraud represent five direct benefits for students and McGill. Other similar models exist around the world.

The findings from this research and this final report will be of use to registrarial and pathway leaders involved in transfer and mobility practice and policy within Ontario's higher education institutions and allied organizations such as ONCAT, the Ontario Universities' Application Centre (OUAC), OCAS Inc., the college application service provider, and government. The final report is not intended for information

¹² See <u>https://www.cicic.ca/1398/An-overview-of-the-Lisbon-Recognition-Convention/index.canada</u>

¹¹ See <u>http://goglobalcanada.ca/</u> by the University of Ottawa Centre for International Policy Studies and the Munk School of Global Affairs at the University of Toronto

¹³ See <u>http://www.groningendeclaration.org/</u>

¹⁴ See more details at CHESICC's website: <u>https://www.chsi.com.cn/en/</u>. The China Academic Degrees & Graduate Education Information service provides official verification of degrees. (see <u>http://www.cdgdc.edu.cn/</u>).

technology professionals, system design architects, programmers, or others involved in the technical aspects of data exchange, integration, and system design. As most of those consulted for the research support the business and policy realms of transfer and mobility, the terminology and the related findings should be considered in that context.

Section 2.0 – The Research Approach

The project included conducting primary and secondary research to identify the current state of postsecondary student data exchange, potential exemplars, and opportunities for enhancements (Figure 2). The former included administering a national, bilingual (French, English) survey to capture input from Canadian post-secondary institutions and supporting organizations and conducting qualitative interviews and regional consultation meetings with pathway and registrarial experts in Canadian higher education. The secondary research involved reviewing websites and scholarly and trade research in the field of student data exchange. This multi-faceted approach ensured meaningful engagement; a comprehensive and nuanced understanding of current practice; and, several opportunities to identify member informed recommendations.

Figure 2: Research Approach



Project Collaboration

The research process benefitted from participation from registrarial leadership at each of the 45 publicly funded post-secondary institutions in Ontario and from the partnering support of the Ontario College Committee of Registrars, Admissions, and Liaison Officers (CRALO) and the Ontario University Registrars' Association (OURA). Interviews with the leadership and staff at ONCAT, OCAS (the college application service), and the Ontario Universities' Application Centre (OUAC) informed the findings as well. The collaborative approach to engaging the Ontario higher education community in the research consultation process represented a core strength of the project and was necessary due to its complexity.

Three student data exchange projects led by ARUCC were happening simultaneously (this ONCAT project, the *ARUCC Groningen Project*, and a similar BCCAT funded project). Therefore, the primary investigator secured agreement from the various partners to collaborate on the research and to share findings across five deliverables: the ONCAT research report; three deliverables for the *ARUCC Groningen Project* (i.e., the business case, ARUCC's funding outreach call, and the planned Request for Proposal); and the BCCAT research findings. The approach facilitated efficient data collection and

avoided interview and survey fatigue. All interview and survey participants were informed of this approach in writing and the primary investigator reiterated this verbally at the start of each interview and regional meeting. All were invited to identify any concerns with this approach; none were reported.

The primary investigator developed all communications and interview materials used to support the research in collaboration with each of the partners. The ONCAT project also included a requirement to employ an external evaluator. Joanna Pesaro was subsequently engaged. She reviewed and provided comments and suggestions on the research approach, the survey, the communication materials, the interview guide, and the final report for the ONCAT project. As mentioned earlier, Appendix A contains her final assessment report on the research project.

Project Phases

The project transitioned through four phases spanning the time period from April 2018 to March 2019: project launch, environmental scan planning, environmental scan launch, and data analysis and report development (Figure 3). The project partners, ARUCC leadership, and external evaluator supported the research through each phase.

Project launch encompassed confirming and signing the contract with ONCAT and defining and implementing the partnership framework for the project in collaboration with ARUCC and the project partners, CRALO and OURA. This phase also included confirming and validating the project plans with the external evaluator.

The next phase involved planning for the environmental scan which included design and testing of the national, bilingual survey and the other forms of consultation. The primary investigator incorporated suggestions for changes to the survey received from the evaluator and the project partners. These same individuals commented on the initial list of locations and participants for the regional meetings and the qualitative interviews. The primary investigator involved the project partners and the external evaluator in providing advice on the format and the supporting communications for the interviews and the regional meetings.

The launch of the environmental scan began with the opening of the national survey, a review of institutional websites, and the initial stages of the literature and trade research. To the extent possible, the interviews occurred after institutions and organizations responded to the survey. The regional meetings began in early October with the final one occurring on January 10, 2019. The long time-frame associated with this phase resulted from the scheduling and workload pressures experienced by the institutional representatives participating in the research.

The last phase began in December 2018 with the closure of the national survey. It involved a review of the survey findings and the interview notes from the institutional interviews and regional meetings. Crafting and submission of the final report occurred in this phase.

Figure 3: The Project Phases



Target Audience for Research

The target audience for the survey, the interviews, and the regional meetings included pathway and registrarial experts at post-secondary institutions and supporting organizations. This also included leaders with knowledge of data exchange practices from Canadian post-secondary institutions, application centres, and government data hubs.¹⁵

The post-secondary institutions involved in the interviews and regional meetings for this report included recognized colleges, institutes, and universities primarily located in Ontario supported by research that occurred in other parts of Canada (Appendix B). All recognized post-secondary institutions in Ontario were invited to participate in the interview process and the regional meeting(s) held within their jurisdiction.

The supporting organizations invited to participate in the survey, regional meetings, and/or interviews included provincial application centres from across Canada such as the Ontario Universities' Application Centre (OUAC) and OCAS (the college application centre), transfer pathway councils such as the Ontario Council on Articulation and Transfer (ONCAT), and known government departments that engage in student level data sharing with post-secondary institutions (Appendix C). While each of the seven councils on articulation/admissions and transfer participated in the national survey, most of them do not directly support student data exchange; rather, they use anonymized data to support research and policy development.

The government departments invited to take the survey included the BC and Saskatchewan education ministries, each of which maintain a data repository of secondary school student credentials for their provinces. Interviews occurred with an inter-provincial research organization which collects and conducts student mobility research across three provincial jurisdictions called the Maritime Provinces Higher Education Commission (MPHEC)¹⁶ and a national organization called the Canadian Information

¹⁵ The research scope included post-secondary institutions and applications centres/data hubs that provide most of the student data exchange support in Canada; vendors, governments in most jurisdictions, and secondary schools/boards were out of scope.

¹⁶ <u>https://www.mphec.ca/</u>

Centre for International Credentials (CICIC).¹⁷ CICIC is part of the Council of Ministers of Education, Canada (CMEC). It is responsible for establishing credentialing standards in accordance with the Lisbon Recognition Convention¹⁸ and disseminating information to the public in support of international credential assessment.

National, Bilingual Survey (French, English)

A national, bilingual (French, English) survey supported the research process (Exhibit A). It included quantitative and qualitative questions across three dimensions: institution/organizational and respondent demographics including provincial location (to facilitate follow up, cross-tabbing, and a focus on Ontario data); the current state for student information systems and data exchange; and questioning to capture expert insights on considerations and requirements for student data exchange. Typically, a Likert scale was used when capturing expert recommendations and opinions.

Originally, the research plan involved restricting the survey to distribution within Ontario only; however, the existence of the *ARUCC Groningen Project* and the BCCAT project presented an opportunity for inter-jurisdictional benchmarking. The primary investigator secured agreement from the project partners including CRALO, OURA, and ONCAT to distribute the survey nationally and share findings, a decision that was transparently messaged to potential respondents in advance. This approach minimized the number of surveys in the field requesting the same information at the same time.

Originally, the plan was to distribute the survey in fall 2018 over an eight-week period (October to November); however, consultation with the partners suggested a longer distribution would be appropriate to provide more time for institutional representatives to complete the survey. Early consultation suggested a summer launch might be more timely and easier for institutional representatives to accommodate. Therefore, the primary investigator opened the survey in mid-summer. Ultimately, this approach did not prove beneficial due to vacations and institutional workload demands impacting the September start of classes. The project partners and leadership agreed to keep the survey open until the end of November/beginning of December 2018 to accommodate a longer window of opportunity for institutions and allied organizations to respond.

The survey was distributed to Ontario college and university registrars directly and ARUCC registrarial members via the national ARUCC listserv. Recommended participants included those with expertise in registrarial systems, information technology, and student data exchange. Supplemental distribution occurred to institutions through registrarial association listservs from across Canada.¹⁹ In addition, the researcher sent email invitations to representatives of supporting organizations and through the listserv of the Canadian Post-Secondary Electronic Standards User Group (CanPESC),²⁰ which maintains membership from post-secondary institutions, allied organizations, provincial governments, and vendors involved in student data exchange. Appendix C provides a list of organizations contacted. Three formal

¹⁷ <u>https://www.cicic.ca/</u>

¹⁸ <u>https://www.cicic.ca/1398/an overview of the lisbon recognition convention.canada</u>

¹⁹ Specifically, the invitation was distributed to colleges, institutes, and universities with membership in ARUCC and/or the Western Association of the Universities and Colleges of Canada (WARUCC), the British Columbia Registrars' Association (BCRA), the Alberta Registrars' Association, the Ontario University Registrars' Association (OURA), the Ontario College Committee of Registrars, Admissions, and Liaison Officers (CRALO), the Quebec Bureau de coopération interuniversitaire (BCI), and the Atlantic Association of Registrars and Admissions Officers (AARAO).

²⁰ <u>http://www.pesc.org/canadian-pesc-user-group.html</u>

reminders were distributed through the same listservs. Potential post-secondary respondents were encouraged to participate in the survey at various pan-provincial and national meetings.

Material distributed with the survey included a bilingual word version to reduce the number of people accessing the survey to print out an advance copy, links to a website with more information on the project,²¹ a supplementary document which provided further details about the project and how the results would be used,²² and a contact person for any questions. Although more findings are shared in a subsequent section, a total of 117 respondents participated in the survey.

Qualitative Interviews and Regional Feedback Sessions

In total, the primary investigator interviewed 40 representatives of higher education organizations and students in fall 2018 for this research. These included 31 qualitative interviews with representatives from ten colleges and nine universities in British Columbia, Alberta, and Ontario²³ (Appendix B), ten supporting organizations from across Canada (Appendix C),²⁴ and nine students, one of whom represented a national student association and two of whom represented Ontario student associations. Fifteen of these interviews included six colleges and six universities from Ontario, ONCAT,²⁵ OCAS,²⁶ and OUAC.²⁷

Initial consultation occurred with the representatives for CRALO and OURA and the external evaluator to determine which institutions to interview in Ontario. Adjustments occurred to the original list given institutional schedules and capacity to participate. The final 12 Ontario institutions interviewed represent the diversity that exists in the province across several dimensions: location, institution type, sector affiliations, program and credential mix, enrolment size, and linguistic focus (Figure 4, Appendix B).

The consultation research also included conducting 11 inter-organizational regional meetings with 231 representatives from recognized post-secondary institutions and allied organizations in Ontario and BC (Appendix D). All but one of these were held in Ontario. Individual participants in the regional meetings typically included registrarial, pathway, and systems/data exchange experts from institutional Registrars' Offices and information technology departments, and from provincial application centres. In one instance, decanal and faculty representatives participated.

²² For Ontario:

²¹ <u>http://arucc.ca/en/oncat-bccat-projects.html</u>

http://arucc.ca/uploads/ONCAT_and_BCCAT_Projects/ONCAT_Funded_Data_Project_Overview_for_website_July_13_2018.pd f

For BC:

http://arucc.ca/uploads/ONCAT_and_BCCAT_Projects/Proposal_BCCAT_Research_Study_for_sharing_with_others_July_16_20 18_REVISED.pdf

²³ An Alberta college, Medicine Hat College, also requested to participate in the interview process.

²⁴ Three separate individual interviews occurred for NBCAT as the leadership at that organization is exploring creation of an application centre and a transcript exchange.

²⁵ <u>https://oncat.ca/en/welcome-oncat</u>

²⁶ <u>https://www.ontariocolleges.ca/en</u>

²⁷ https://www.ouac.on.ca/

These interviews and regional meetings served to deepen an understanding of local organizational contexts and perspectives in higher education with respect to student data exchange, clarify the survey findings, and further refine an understanding of the typology of student data exchange practices and perspectives. The report highlights the thematic findings from the Ontario interviews with inter-jurisdictional contrasts identified where appropriate.

Qualitative Interviews with Institutions and Supporting Organizations

The interviews each took approximately 1 to 1.5 hours and were conducted using a virtual teleconferencing platform called *Zoom*.²⁸ The communication process for the interviews included advance email distribution of the invitation and the interview guide (Exhibit B), which went to the registrar or lead for each institution or organization. The guide provided an overview of the project and the interview questions. If a survey response existed for the institution or organization, the primary investigator provided the responses in advance of the interview. The communications messaging also identified the intention to share the findings across the three projects. In addition, the primary investigator created and shared websites with additional information about the ARUCC Groningen Project²⁹ and the two ONCAT and BCCAT projects.³⁰ At the suggestion of the external evaluator, the websites provided further details on how the data would be used.

After sending the original invitation, the primary investigator contacted each institutional registrar or organizational lead to schedule an interview opportunity. They were encouraged to include faculty and staff from across their organization with expertise in student data exchange and transfer. Most participants included registrarial and information technology staff. Requests for interview opportunities were also made at provincial and national meetings such as at the Ontario university registrars' forum, the CRALO Registrars' Forum, and CanPESC.

The interviews followed a structured format in terms of moving through the questions in the interview guide. However, unstructured opportunities were encouraged to allow participants to explain their local context more fully.

²⁸ https://zoom.us/

²⁹ <u>http://arucc.ca/en/projects/task-force-groningen.html</u>

³⁰ <u>http://arucc.ca/en/oncat-bccat-projects.html</u>

Figure 4: Diversity of Institutions and Organizations Interviewed in Ontario



Qualitative Interviews with Students

Originally, the research plan and scope did not include conducting interviews with students. With the support of ONCAT and two institutions out west (University of Victoria, University of Regina), the primary investigator spoke with nine students, three of whom participated as a formal representative of their student association; namely, the Ontario Undergraduate Student Alliance (OUSA), the Ontario College Student Alliance, and the Canadian Federation of Students (CFS). The institutions and ONCAT handled the contact and scheduling of these discussions. At no point was the researcher provided their personal information. All participation was voluntary. The invitation to students included an overview of the project with a link to further information (Exhibit C).

At the start of each discussion, the primary investigator explained how the information that they provided would be used which included a commitment to only provide thematic feedback in the final published report. They were discouraged from sharing confidential personal information and instead asked to provide thoughts on what they or their constituents felt worked or did not work with the sharing of student data between institutions when transferring and what they would recommend be a focus for future changes.

The students participated in a group setting either in person or virtually using *Zoom*. The format was structured and included an explanation of the project and how the information provided would be used followed by questions regarding their perspective on the operational aspects of the transfer experience. They were asked to share how they accessed their official academic documents, whether they experienced any challenges, and what they would suggest required change. In the case of the group session with the three student groups, the researcher asked what they have heard or researched regarding the document exchange barriers affecting successful transfer and what they would recommend be changed. Each session took approximately 45 minutes.

Regional Meetings

As noted, the 11 inter-organizational regional meetings occurred between September 2018 and January 2019 and involved a total of 231 people (Appendix D). Registrarial, pathway, and systems experts from Ontario, British Columbia, and other Canadian institutions, organizations, and government bodies attended these discussions. Most of these sessions occurred in person with the location arranged by a local institutional registrarial lead.

The primary investigator deliberately selected the in-person locations for the Ontario regional meetings to ensure proximity to local institutions and application centres in various regions of the province. These included Sudbury, Ottawa, Kitchener-Waterloo, Guelph, Oshawa, and Toronto (Figure 5). Two occurred using *Zoom* web conferencing. On the advice of the external evaluator, one of these virtual meetings was delivered exclusively for francophone institutions that hold membership in the Association des collèges et universités de la francophonie canadienne (ACUFC).³¹ This session was held in French and led by Romesh Vadivel, the current ARUCC President (2018-2020).

Seven of these meetings were scheduled solely for the project and four opportunities resulted from accessing time on existing agendas of pan-provincial meetings or conferences.³² For the former, advance communication included a formal agenda, an overview abstract of the project, a presentation, and links to the project website.³³ The presentation informed the latter meetings. The invitation for each meeting went to the local area registrars with a request to invite faculty and staff with expertise in student data exchange and transfer (Exhibit D).

Those sessions exclusively focused on the project were typically 2 to 2.5 hours in length. The meeting format included an overview of the project, a facilitated opportunity to provide expert advice on current challenges and requirements, and a needs identification and prioritization discussion. The latter provided individual participants with the opportunity to identify their top recommended business needs, which were then reviewed, privately prioritized, and discussed by the group. This approach facilitated a private opportunity for reflection followed by an opportunity as a collective to discuss and validate or discount any identified business needs and to articulate other potential gaps.

In the remaining meetings where the primary investigator secured space on existing agendas, the format included providing an overview of the project and having an open discussion about challenges, opportunities, and business needs.

The primary investigator led most of these feedback opportunities. In three instances, Charmaine Hack, chair of the ARUCC Groningen Project Steering Committee, or Romesh Vadivel, current ARUCC president (2018-2020) helped lead the sessions. The external evaluator

³¹ <u>http://acufc.ca/</u>

 ³² Specifically, these included the fall meetings for the Ontario University Council on Admissions, the Ontario University Registrars' Forum, and the BC Registrars' Association, and the Ontario colleges' fall conference.
³³ http://arucc.ca/en/oncat-bccat-projects.html

attended one of these meetings as an observer at the request of the primary investigator (the session at the fall CRALO conference).



Figure 5: Locations for In-person Regional Meetings within Ontario

FN 1: Red icons = Ontario universities; green icons = Ontario colleges

Data Limitations

The registrarial leaders invited to respond to the survey and to participate in the interviews and regional meetings were encouraged to include faculty and staff from across their institution with expertise in student data exchange. In most of the interviews and regional meetings, the participants included registrarial and systems staff. Only one regional meeting included faculty. This likely resulted from relying primarily on registrarial and CanPESC listservs for participation. Also, some registrarial leadership anecdotally indicated that they worked with their technical IT staff to complete the survey results and made a collaborative submission. The researcher also met with the inter-institutional Ontario college technical group for those institutions that use Ellucian's Banner student information system to explore technical considerations more directly. While these approaches satisfied the objectives of this research, next steps for examining data exchange would benefit from more engagement from system design architects and data security specialists.

The survey allowed for more than one response per institution. This worked well for capturing opinions and recommendations. However, a small subset of institutional respondents provided contradictory responses for information about current practices. The primary investigator excluded these responses during the data analysis process to ensure a clear understanding of current practice. Limiting the number of organizational respondents or encouraging advance collaboration on responses for information on current practices would be a recommended tactic for future surveys.

Some of the regional consultation opportunities that occurred as a result of accessing space on existing province wide meetings or conferences provided somewhat limited insights for the project. Meeting privately in focused regional meetings or directly with registrars was more helpful to this research. Future consultation on projects focused on data exchange would benefit from using a similarly focused consultation tactic.

With respect to the interviews and regional meetings, most of the discussion and feedback focused on strategic and operational level considerations and needs, not technical requirements. This outcome worked well for this research as the scope did not include capturing a detailed understanding of data exchange architectures and integration practices. As noted above, a more technical analysis would be an appropriate next step for future research to support implementation. The national consultation for the *ARUCC Groningen Project* illustrates the value of this approach.

Subsequent to completion of the primary research phase for the ONCAT project and aided by the primary investigator for this project, the *ARUCC Groningen Project* established a national technical advisory committee with information technology, data security, and system design experts from Canadian post-secondary institutions.³⁴ The mandate of this group included creating the technical requirements for the national network.³⁵ Their knowledge of detailed use case mapping, information flows, data exchange, and data security suggests that further detailed research and consultation of a technical nature would be necessary to support implementation of a network for the Ontario post-secondary community and application centres.

Those consulted for this study provided insights and information that supported achieving the objectives of this research. Further detailed research and consultation of a technical nature would be necessary to support implementation of a national network for the Ontario post-secondary community and application centres.

³⁴ <u>http://arucc.ca/en/project-governance.html</u>

http://arucc.ca/uploads/Groningen/Groningen 2019/Governance Page/TAC Terms of Reference TAC as of Jan 25 2019. pdf

Definitions

Apostille: a 'legal certification that makes a document from one country valid in another (provided that both are signatories to the 1961 Hague Convention Abolishing the Requirement for Legalization for Foreign Public Documents.' (Oxford Dictionnaries, 2019) Currently, Canada is not a signatory to the Hague; however, the government provides protocols for establishing the authenticity of documents, including for post-secondary documents (Government of Canada, 2017). Applying the signature of the registrar to a transcript is one example.

Application Centre or Data Hub: a global reference used in the report to encompass the 11 provincial organizations that centralize some aspect of data collection and exchange as a support to post-secondary studies or transition beyond secondary school for admissions. See Appendix C for a list of organizations.

Application Programming Intervals (APIs): routines, protocols, and tools to allow sharing of data between software that allow standardized information flow (without modifying original content) and communication between different components (MIT Libraries, n.d.).

Digital Signature: 'a mathematical scheme for demonstrating the authenticity of digital messages or documents. A valid digital signature gives a recipient reason to believe that the message was created by a known sender (authentication), that the sender cannot deny having sent the message (non-repudiation), and that the message was not altered in transit (integrity).' (Chakroun & Keevy, 2018)

Electronic Data Interchange (EDI): 'provides a technical basis for automated commercial 'conversations' between two entities, either internal or external. The term EDI encompasses the entire electronic data interchange process, including the transmission, message flow, document format, and software used to interpret the documents.' (Chakroun & Keevy, 2018)

Endpoints: 'any piece of computer hardware with an internet connection....[e.g.,] desktop computers, laptop computers, tablets, smartphones, and other devices.' (National Student Clearinghouse, Educause, REN-ISAC, 2018)

Extensible Markup Language (XML) Standard: 'a flexible way to create information formats and electronically share structured data via the public network, as well as via corporate network...the PESC XML-based data standard for *Common Credential for Certificates, Degrees and Diplomas* is an example of a standard that is designed for both electronic certification production and recording credential learning records.' (Chakroun & Keevy, 2018)

Flat File Format: data stored in a single table following a uniform format; it does not provide relational capacity. Example: Comma Separated Values (CSV) File

Metadata: provides information (in the form of data) about other data being sent to support sharing of digitized credentials. Providing information about the type of file and content being sent represents an example.

Multifactor Authentication: a system that relies on more than one layer of security to authenticate a user (National Student Clearinghouse, Educause, REN-ISAC, 2018).

Official: in the context of this research, it represents a document that is confirmed as authentic by the institutional registrar. Typically, a document is considered official when it is provided by the registrar directly to the requestor without being passed to a student (with a student's permission provided).

Portable Data Format (PDF): 'a document independently of the hardware, operating system and application software used to create the original file. It was designed to create transferable documents that can be shared across multiple computer platforms.' [sic] (Chakroun & Keevy, 2018) Adobe documents represent a form of PDF.

Recognized Institution: an institution that has met the quality assurance standards in its respective jurisdiction. For Canada, it refers to Canadian institutions that are recognized in accordance with the quality assurance protocols within their province or territory as there is no national quality assurance agency.

Student: institutions define *students* differently and in accordance with local context. For the *ARUCC Groningen Project*, this ONCAT research, and the national network, a *student* includes an individual who meets at least one of the following criteria:

- 1. has applied to a Canadian post-secondary institution either directly or through a provincial application centre
- 2. has been admitted to a Canadian post-secondary institution
- 3. has completed a credential at a Canadian post-secondary institution
- 4. is currently enrolled in a Canadian post-secondary institution
- 5. was once enrolled in a Canadian post-secondary institution

Supporting Organizations: a global reference used in this report to encompass the provincial application centres, data hubs, and councils of articulation/admissions and transfer.

Trusted International Organizations: recognized institutions, government mandated organizations, or organizations designated by recognized institutions in their home country as the official source for students' credentials. These organizations are formally designated by the institutions and governments in their regions as being the official source when validating the bone fides of official academic documents for the purposes of post-secondary admission. In the context of this research and the national project, recruitment agents are not categorized within the definition of *trusted organizations*.

Use Case: a list of actions or event steps typically defining the interactions between a role and a system to achieve a goal.³⁶

³⁶ <u>https://en.wikipedia.org/wiki/Use_case</u>

Section 3: Environmental Scan

One of the objectives of the study included conducting an environmental scan to contextually situate the topic of student data exchange and to identify exemplars. The approach taken for this research included a review of relevant literature, websites, white papers, and other research published by vendors, higher education organizations and leaders, and scholars. The qualitative interviews helped to augment these findings. Each of the following topics is briefly explored in this Section.

- Stakeholders
- Increasing needs
- National connectivity
- Privacy regulations
- Document fraud
- Data security
- Data exchange models

Stakeholders

Various organizations and vendors provide extensive expertise in partnership with post-secondary institutions to advance student transfer, mobility, and data portability. Although listing all the organizations involved in student data exchange sits outside the scope of this research, Figure 6 highlights the main Canadian and select international ones relevant for Ontario post-secondary institutions, the *ARUCC Groningen Project*, and the national student data exchange network.³⁷

Figure 6: Overview of Main Organizations involved in Student Data Exchange for Canada



³⁷ See Appendix E for further details on the Canadian organizations involved in data exchange.

Ontario Stakeholders

In Ontario, 45 publicly funded post-secondary institutions and two application centres (the Ontario Universities' Application Centre (OUAC)³⁸ and OCAS³⁹ (the college application service centre) directly support student data exchange. The centres support intra-provincial transcript exchange and collect and deliver application information and documentation for Ontario's post-secondary institutions as these tasks relate to admissions processing. These and ONCAT represent the main Ontario organizations consulted for this research.

The provincial government receives enrolment and graduating information from Ontario post-secondary institutions to support a host of purposes including planning for and allocating public funds; supporting post-secondary education and related programs; ensuring legislative compliance; risk management; monitoring and evaluating quality; and conducting research (Government of Ontario, 2012-19). It further delivers the government financial aid program called the *Ontario Student Assistance Program* (OSAP).⁴⁰ Extensive student data exchange exists between the post-secondary institutions and the provincial government to support administration of this program. As the research focused on the exchange of academic documents, examining these areas remained out of scope for this research.

The findings suggest a subset of Ontario post-secondary institutions rely on vendors to support certain functions such as credential verification and transcript/diploma distribution. Most Ontario institutions rely on vendors for their student information systems; these systems typically provide capacity for data exchange. Assessing the various vendor systems remained out of scope for this ONCAT research; however, they represent important contributing members to the student data exchange discussions both as experts and enablers. They are a source of support, information, and guidance, and provide manuals, service announcements, white papers, and instructional and promotional pieces to support system integration, system design, software and hardware implementation, data exchange, and more.

National and International Stakeholders

Prior research conducted by ARUCC suggests the involvement of four main organizations in postsecondary student data exchange in Canada (ARUCC, 2018):⁴¹ post-secondary institutions (approximately 225 of which 204 are publicly funded), centralized application centres (7), provincial government student data exchange hubs (two in British Columbia and Saskatchewan), and other supporting organizations (i.e., the Nova Scotia Council on Articulation and Council - NSCAT⁴² and the Québec Bureau de coopération interuniversitaire - BCI) (Appendix C). Secondary schools/boards, regulatory bodies, provincial and federal governments, and other third-party organizations (e.g., vendors) support post-secondary student data exchange as well.

Six of the seven Canadian councils on articulation/admissions and transfer typically only share anonymized student data to advance research (including ONCAT); however, they serve an important role to improve transfer supports and ensure provincial and national focus and research on student

³⁸ <u>https://www.ouac.on.ca/</u>

³⁹ <u>https://www.ontariocolleges.ca/en</u>

⁴⁰ <u>https://www.ontario.ca/page/osap-ontario-student-assistance-program</u>

⁴¹ <u>http://arucc.ca/en/project-overview.html</u>

⁴² <u>https://www.mynsfuture.ca/</u>

transfer and mobility within and beyond regional boundaries. Any future research and data exchange initiatives would benefit from the involvement and engagement of these partners.

Most of these application centres and hubs collect data and documents and exchange transcripts to support admissions into post-secondary institutions within their region. The two government bodies in BC and Saskatchewan provide official secondary school transcripts, amongst other supports. The Nova Scotia Council on Articulation and Transfer (NSCAT) oversees a transcript exchange network in addition to providing other supports.⁴³ The Québec Bureau de coopération interuniversitaire (BCI) provides an exchange service to support university students wishing to take a course at another post-secondary institution in that province.⁴⁴ It also facilitates sending CEGEP results to OUAC.⁴⁵ Including the application centres in future data exchange implementation would be advisable given the supports they provide post-secondary institutions.

At the national and international levels, two organizations directly support data exchange: the Post-Secondary Electronic Standards Council and its Canadian working group, the Canadian Post-Secondary Electronic Standards Council User Group (CanPESC). CanPESC is represented on the *ARUCC Groningen Project* steering committee and the project's technical advisory committee. A PESC member also sits on the latter group. These two organizations collaborate with post-secondary institutions, vendors, and other organizations to create open source standards as a support to student data portability to ensure rigour within and between data exchange formats. As one example, PESC provides a change protocol for streamlining any needed advancements or changes to data exchange formats.⁴⁶ PESC also provides protocols to facilitate exchange between standards such as for supporting PDF (Portable Document Format) exchange that includes XML transmission of the underlying data.⁴⁷ This support is important as the findings in the next section demonstrate that several institutions across Canada use more than one method (i.e., XML, EDI, Flat Files, and PDF) to exchange academic documents when they are able to exchange electronically. The application centres and post-secondary institutions within Canada are active participants in PESC. Ensuring engagement with and adoption of PESC data exchange standards would make sense for the national network.

Any future research and data exchange initiatives would benefit from the involvement and engagement of the councils on admissions/articulation and transfer. Including the application centres in future data exchange implementation would be advisable given the supports they provide post-secondary institutions. Ensuring engagement with and adoption of PESC data exchange standards would make sense for the national network.

⁴³ In subsequent sections, NSCAT and BCI are included in the count for application centres and hubs although they aren't considered *hubs*.

⁴⁴ <u>https://mobilite-cours.crepuq.qc.ca/4DSTATIC/ENAccueil.html</u>

⁴⁵ <u>https://www.ouac.on.ca/guide/105-transcripts/#quebec</u>

⁴⁶ <u>https://www.pesc.org/standards-development-1.html</u>

⁴⁷ <u>https://www.pesc.org/pesc-approved-standards.html</u>

The international context relevant to this Ontario project and the national data exchange network is also informed by the work of the Groningen Declaration Network (GDN), a Netherlands trust that is focused on data portability and digitization to enhance student mobility.⁴⁸ It brings together representatives from around the world who seek to support this effort and serves as the initial inspiration for the *ARUCC Groningen Project*. ARUCC is a formal signatory to the GDN.

The Canadian Information Centre for International Credentials (CICIC) of the Councils of Ministers of Education, Canada (CMEC)⁴⁹ is supporting similar efforts internationally as the GDN but with a focus on policy and quality assured practices such as are embodied in the new Global Convention, which seeks to bring together the many regional conventions supporting student mobility such as the Lisbon *Recognition Convention* (LRC).⁵⁰ The *Global Convention* aspires to stretch across all country boundaries as it focuses on implementing the UNESCO Sustainable Development Goals (Canadian Information Centre for International Credentials, 1990-2019).⁵¹ Of relevance to this project is Goal #4 which focuses on the quality of higher education. According to CICIC, the *Global Convention* seeks to cooperatively recognize and support student mobility and the right of academic credential recognition and recognition consistency. While it remains to be seen what will emerge of specific relevance to the Ontario postsecondary institutions or the national network, digitization represents an aspect of the discussions. As an example, UNESCO is working collaboratively with other organizations to create a vision for an international standard for electronically documenting, authenticating, and sharing a person's learning in a way that is understandable, supported by broad access (i.e., 'at anytime and anywhere'), and shared in a manner that still allows amendments by the individual document owner and/or the authorized party (Chakroun & Keevy, 2018, p. 34). Exchanging transcripts represents one document type impacted by this vision. Other potential documents could include ones like credentials which articulate learning outcomes achieved or the new European Qualifications Passport for Refugees, a document which recognizes prior academic and vocational learning in the absence of official documents.⁵² While a full discussion of these topics falls outside of the scope of this paper, the context remains important for Canadian post-secondary institutions contemplating participation in a national data exchange network.

Exchanging transcripts represents one document type to exchange. Other potential documents could include ones like credentials which articulate learning outcomes achieved or the new European Qualifications Passport for Refugees, a document which recognizes prior academic and vocational learning in the absence of official documents.

Of relevance to the ONCAT research and the *ARUCC Groningen Project* is the US-based National Student Clearinghouse (the *Clearinghouse*). According to its website, the *Clearinghouse* provides data exchange,

⁵⁰ The LRC is ratified by the Canadian government – See

⁴⁸ <u>https://www.groningendeclaration.org/</u>

⁴⁹ https://www.cicic.ca/

https://www.cicic.ca/1409/unesco global convention on the recognition of higher education qualifications.canada ⁵¹ https://en.unesco.org/sdgs

⁵² "a document providing an assessment of the higher education qualifications based on available documentation and a structured interview. It also presents information on the applicant's work experience and language proficiency. The document provides reliable information for integration and progression towards employment and admission to further studies. It is a specially developed assessment scheme for refugees, even for those who cannot fully document their qualifications." [sic] https://www.coe.int/en/web/education/recognition-of-refugees-qualifications

official verification, research services, and other supports for 3,600 post-secondary institutions and 12,200 participating high schools in the United States.⁵³ Participants in the research process for this project noted the *Clearinghouse* and referenced it as an exemplar model for the *ARUCC Groningen Project* given its supports for official student data exchange and its broad mandate which includes research.

Student Stakeholders

Supporting learner mobility and maintaining a student focus sits at the heart of the *ARUCC Groningen Project's* principles; therefore, capturing the student perspective remains an important consideration for the national data exchange project.⁵⁴ The three student associations in Ontario provide a series of supports to post-secondary students including research and advocacy. These include the Ontario College Student Alliance,⁵⁵ the Canadian Federation of Students (CFS),⁵⁶ and the Ontario Undergraduate Student Alliance (OUSA). While they support various programs for students including administration of health plans, the primary reason for referencing them in this report is to acknowledge their contributions to understanding the student experience as it relates to creating a seamless transfer system.

The Ontario College Student Alliance tabled a report examining the Ontario transfer system which provided an overview of the experiences of students and the impediments to seamless transfer. The report outlined a series of recommendations to encourage change (Popovic, 2012).⁵⁷ Those relevant to the project include calls for increased efficiency, improved supports, and better coordination and tracking (pp. 10-12). The report stresses the value of looking to international jurisdictions for potential exemplars to improve practices (p. 16), a core consideration in both this ONCAT study and the *ARUCC Groningen Project*. These recommendations align with this current Ontario research and plans to create a national data exchange network to enhance student mobility.

As with the other student groups, the CFS has long advocated for change to the credit transfer system⁵⁸ and improvements to supports for international students, a group often impacted by a lack of electronic transcript exchange.⁵⁹ At the 2018 ONCAT Student Pathways in Higher Education, the CFS chairperson, Nour Alideeb, emphasized support for student transfer and mobility and noted the lack of clear information, consistency, bureaucracy, and duplication of time and resources.⁶⁰ Suggestions for change included standardizing the processes and increasing access for marginalized learners.

OUSA examined transfer in a study representing findings from a 2015 survey of more than 10,000 Ontario students across six universities.⁶¹ A subset of this cohort (13%) reported transferring credits during their studies (47% by transferring into a new institution and 35% by transferring supplementary credits) (2017). Findings from this report suggest that transfer represents an important access enabler. As such, it calls for the removal of barriers to assist students. An illustrative example cited in the report

⁵³ <u>https://studentclearinghouse.org/about/</u>

⁵⁴ http://arucc.ca/en/projects/task-force-groningen.html

⁵⁵ <u>https://www.collegestudentalliance.ca/about</u>

⁵⁶ <u>http://cfsontario.ca/about/principles/</u>

⁵⁷ https://docs.wixstatic.com/ugd/0b1b3b_c7a8d8e56eb14448965b49a82bea84d7.pdf

⁵⁸ <u>http://cfsontario.ca/campaigns/credit-transfer/</u> - This dataset focuses on 6 of 7 OUSA member institutions; therefore, the association suggests extrapolating the findings to other institutions would be problematic. The data provide interesting insights, however, and are included to help provide additional context.

⁵⁹ http://cfsontario.ca/wp-content/uploads/2017/07/Factsheet-InternationalStudents.pdf

 ⁶⁰ http://www.oncatconference.com/2018/documents/papers/D1%20-%20Canadian%20Federation%20of%20Students-ON.pdf
⁶¹ https://www.ousa.ca/research_reports

involves post-secondary institutions noting transfer credit awards within offers of admission as a way to provide students with full information at a critical decision-making point (p. 3). This represents an innovation which would require more scalable service delivery frameworks including electronic academic document exchange between post-secondary institutions and subsequent automation in order to benefit all transfer students.

Other research highlights from this report of relevance to this project include the following (pp. 14-15):

- Most of the students surveyed received transfer credit for studies completed at Ontario postsecondary institutions (81%) with 19% from out-of-province studies.
- Most identified as mature, part-time, Indigenous, first generation, from the lowest income bracket, having a disability, and supporting dependants.
- Most came from Ontario (92%) with the next highest sending province reported as British Columbia (3%).
- Five percent identified as international with most coming from China (47%), Nigeria (5%), and India (3%).
- University to university represented the most common transfer (71%; college to university represented 31%).

Increasing Needs

The need to support increasing volumes of students remains an important consideration for this project. The research consultation process found indications of growing volumes of incoming students who bring with them academic documents requiring official validation from the originating institution or organization before Canadian post-secondary institutions would approve admissions and/or transfer credit (e.g., for transcripts and language test results). Similarly, institutional representatives reported increasing volumes of requests from students with outgoing document validation requests for other third parties that require official verification.⁶² As the findings in the subsequent sections of the report demonstrate, most institutions are manually addressing many of these activities. Much of the incoming document volume likely result from institutional admission standards and the need to ensure a strong fit between students and the academic programs in which they are interested to ensure success. Both areas may also result from growing concerns regarding document fraud. Regardless of reason, the demands are placing increasing pressures on Canadian post-secondary institutions, including those in Ontario, as many are receiving paper transcripts, particularly for out-of-province and international students, in addition to formally and officially validating previously provided admission offers and confirmations of status originally shared directly with students. They further reported manual effort to assess transfer credit, even for those who had previously studied in Ontario post-secondary institutions and provided electronic transcripts through the application centres.

Post-secondary institutional representatives indicated that they do not systematically track all the volume transaction trends in these areas. This data gap matches previous research, which examined

⁶² Official confirmations of student status in this context refers to requests by third parties for confirmation directly from the Registrar rather than via a student. Third parties include other post-secondary institutions, regulatory bodies, trades associations, government, employers, banks, health care providers, and others. Outgoing document validation requests are resulting in high volumes of requests to formally and officially confirm offers of admission, enrolment, fees paid, pending graduation, and graduation.

international document processing practices for transfer and exchange (Duklas, January 2019). Three areas provide proxy indicators of the growth and volume: international post-secondary study permits, Registered Education Savings Plans (RESPs), and graduation rates. The findings demonstrate the significant volumes impacting institutions and the implications for student service.

Although briefly addressed below, inter-provincial student transfer volume does not appear to be a significant driver although comprehensive data for examining this area are limited. This represents a focus for future research. The report provides Ontario's in-province transfer numbers to the extent these are available.

Incoming and Outgoing Document Validation Example: International Students

Canadian institutions require international applicants to submit various academic and supporting documents to support the admissions and transfer assessment processes, including transcripts and course outlines for those with prior post-secondary studies. Official language proficiency test results or other test results (e.g., LSAT, GMAT, etc.) may also be required. Institutions need official validation of these documents from the originating institutions and testing organizations. If admitted, institutions send students offers of admission. As these are sent directly to the students, third-party organizations, including government, contact institutions to officially verify these documents.

The Canadian government issued 491,070 post-secondary study permits in 2018 versus 333,645 in 2015, which represents a 47% increase.⁶³ Most of these students came from China and India. Proportionally, Ontario represented the largest destination province, attracting 64% of the total pool (Figure 7). Its volume grew by 58% from 199,920 study permits in 2015 to 315,915 in 2018. In contrast, other provinces and territories grew 31% over the same period. While the year-over-year percentage changes slowed for Ontario (from 25% for 2015-16 to 7% from 2016-17), the volume remains notable.⁶⁴ Most of the students enrolled in post-secondary institutions in and around Toronto, although institutions in other Ontario regions experienced increases (Figure 8, Table 1).

According to the consultation both in Ontario and Canada, the academic credentials for these students typically arrive as paper documents; some arrive as PDFs which lack machine-readable data.⁶⁵ Most require manual handling during the admissions and transfer credit assessment processes. Previous research for ARUCC conducted by this project's research group indicates several international organizations across the world exist and are well positioned to become trusted providers of official electronic academic credentials to Canadian post-secondary institutions to ease this manual processing and speed up service for students.⁶⁶

Due to fraud and other concerns, the above volumes are also driving requests from the federal government to post-secondary institutions to officially validate offers of admission and enrolment for international students. Institutions reported time consuming requests to manually vet lists of students

⁶³ Source for study permit data: Immigration, Refugees and Citizenship Canada,

https://open.canada.ca/data/en/dataset/90115b00-f9b8-49e8-afa3-b4cff8facaee

⁶⁴ Institutions do not track data on what portion of these represent transfer students, making further analysis difficult.

⁶⁵ LSAT, GMAT, International Baccalaureate, and TOEFL represent examples where it is possible to access these results electronically. As an example, the Ontario Universities' Application Centre (OUAC) accesses LSAT scores and others from American testing organizations.

⁶⁶ See A Sample of National Level Student Data Exchange and Validation Services at <u>http://arucc.ca/en/project-overview.html</u>
with study permits to validate their subsequent enrolment. Most indicated a desire to find a more sustainable, trusted, and efficient method to address these types of requests.



Figure 7: Volume of Study Permits Issued to International Post-secondary Students in Canada

	2015	2016	2017	2018
Ontario	199,920	234,770	293,930	315,915
Other				
Provinces/	133,725	150,280	165,795	175,155
Territories				
CANADA	333,645	385,050	459,725	491,070

Figure 8: Destination Region within Ontario



	2015		2016	2016	2017	2017	2018	2018
	ʻn'	%	ʻn'	%	ʻn'	%	ʻn'	
Region	Count		Count		Count		Count	
Toronto	121,785	61%	137,360	59%	168,580	57%	174,155	55%
Ottawa - Gatineau (Ontario part)	15,210	8%	18,235	8%	21,410	7%	22,405	7%
Kitchener - Cambridge - Waterloo	8,530	4%	13,155	6%	18,335	6%	22,025	7%
London	10,650	5%	14,295	6%	17,750	6%	19,210	6%

	2015		2016	2016	2017	2017	2018	2018
	'n'	%	'n'	%	'n'	%	'n'	
Region	Count		Count		Count		Count	
Hamilton	10,435	5%	12,460	5%	14,130	5%	14,505	5%
St. Catharines - Niagara	6,385	3%	8,820	4%	11,150	4%	12,710	4%
Windsor	5,620	3%	6,780	3%	10,440	4%	12,725	4%
Other regions	21,305	11%	23,665	10%	32,135	11%	38,180	12%
Column Totals	199,920	100%	234,770	100%	293,930	100%	315,915	100%

Outgoing Document Validation Example: Confirmation of Student Status for Registered Education Savings Plans (RESPs)

While not a transfer issue, confirmations of student status to satisfy requests such as to access funding from Registered Education Savings Plans (RESPs) and other third parties represent a form of outgoing documentation validation. The findings indicate these growing requests are eroding registrarial ability to support other areas of the operation. Creating a national data exchange network holds the promise to further streamline the student support framework, thereby freeing up staff resources to provide more value-added services to transfer students.

As an illustrative example, RESP beneficiaries have grown from a population of 53 students when the program first began to over 430,000 in the past twenty years.⁶⁷ The program is projected to continue growing. RESP providers usually require post-secondary students prove they are accepted and enrolled at an institution before allowing funds to be withdrawn. Other scholarship organizations typically maintain similar requirements. Some Canadian institutions provide online capacity for students to download the enrolment confirmation letters which are auto populated with information; however, the research indicates these are in the minority and, at times, not accepted without other customizations. Most Canadian post-secondary institutions manually write unique letters for these kinds of outgoing document validation requests - a resource-intensive, cumbersome process that causes delays for students.

Outgoing Document Validation Example: Confirmation of Graduation Status

Another form of outgoing document validation occurs upon pending or actual graduation. Each year, Ontario graduates make up 40% of the Canadian post-secondary graduating pool.⁶⁸ From 2012 to 2016, Ontario experienced an 11% growth in graduates (from 193,032 to 213,873). Most of these students will be required at some point (and often more than once) to provide official proof they have graduated from their former institution. For example, if a university graduate wishes to study in a graduate diploma program in a college, official proof of graduation is usually required at some point in the process. Students and post-secondary institutions also need to provide similar types of proof to funding bodies, trades associations, regulatory bodies, prospective employers, and other third parties. The research supporting the national project indicates other options exist for more streamlined, official credential verification services which the national network aims to access.⁶⁹

⁶⁷ Source for RESP data: <u>https://www.canada.ca/en/employment-social-development/corporate/reports/evaluations/2015-canada-education-savings-program.html</u>

⁶⁸ Source for all graduating data: Statistics Canada. Table 37-10-0020-01 Postsecondary graduates, by institution type, status of student in Canada and sex

⁶⁹ http://arucc.ca/en/project-overview.html

As graduation rates increase, more streamlined services will enhance efficiencies for students, postsecondary institutions, and potential employers. While the volume increase is relatively low in comparison to the other data cited in this section, the overall volume is high. Furthermore, efficiently supporting graduates with official credential verification and electronic transcript transmission remains essential to ease their transition into other institutions and the workplace.

Inter-Provincial Student Transfer Trends

Gaps in national inter-provincial student transfer data present challenges when attempting to analyze post-secondary mobility trends. A few indicators from other research provide proxy indicators of the volume and need.

- Universities Canada reports that 1 in 10 students study at a Canadian university outside their home province (Universities Canada, n.d.).
- The Maritime Provinces Higher Education Commission (MPHEC) conducted an inter-provincial analysis of new students transferring into the Maritimes from other provinces (2013).⁷⁰ It found students transferred into the Maritimes from almost every college and university in Canada (i.e., over 200) and from post-secondary institutions in 76 other countries. The diversity is extraordinary and likely replicated in other jurisdictions. Thirty-nine percent of the transfers came from other Canadian institutions with most coming from Ontario (15%). For these cohort years, Canadian university and college transfers represented 56% and 23% respectively of this overall pool.
- In another separate trend analysis, MPHEC reported that 10,564 Canadians moved to New Brunswick, Nova Scotia, and Prince Edward Island for post-secondary study, representing a 4.9% increase over the last ten years (2019). This is a somewhat significant volume for that region given the small number of institutions, although there have been declines in recent years (i.e., -3.3% from the prior year).
- BC conducted a separate analysis of BC grade 12 secondary school students from 2002/03 to 2007/08 as part of the *Student Transitions Project* to determine where they completed their post-secondary studies (Heslop, 2010). The findings demonstrate that most of those who moved outside of BC for further academic studies went to post-secondary institutions in Alberta (32%) and Ontario (31%) with the balance heading to post-secondary institutions outside of Canada (20%) or other provinces (7%).
- A national study led by PCCAT compared inter-provincial mobility from 2007/08 to 2009/10 and found small numbers of students moving across provincial boundaries (Heath, 2012).
- Burbidge and Finnie examined inter-provincial mobility for baccalaureate-level university students and found overall mobility rates for Canada were initially 6.3%, 7.0%, and 6.5% for three separate student cohorts, 1982, 1986, and 1990 (2000). They further found that those who moved tended to choose nearby provinces with Nova Scotia and Ontario being destination regions for those that moved farther away from home.
- While not a Canadian example, a recent report published by the non-profit National Student Clearinghouse (the *Clearinghouse*) in the United States found a 38% transfer and mobility rate for first-time students who started in post-secondary in fall 2011 (i.e., two out of five who began

⁷⁰ This study focused on a student cohort enrolled in ten Maritime universities from 2006 to 2009. See <u>http://www.mphec.ca/resources/TrendsV10N1_2013.pdf</u>

that fall had enrolled in more than one institution within six years of starting in post-secondary prior to earning their first degree) (Shapiro, et al., 2018, July).

Electronic transcript exchange does not exist to support the sizable inflow of students from other provinces who are seeking to study in the Maritimes and Ontario, apart from the CEGEP results that are provided to Ontario post-secondary institutions via OUAC.

It would be helpful for this research, the *ARUCC Groningen Project*, and other research and policy needs if a systematic analysis was conducted of national post-secondary student mobility. In the absence of recent data in this area, the above findings provide indicators of the volume. Many of these mobile students are supported by manual assessment practices in Ontario post-secondary institutions. A national data exchange network would present opportunities to streamline this work and subsequently enhance service to students.

A systematic and comprehensive analysis of provincial, national, and international post-secondary student transfer and mobility rates would be helpful research to inform future policy development. It would further provide a more comprehensive understanding of student service gaps and the volumes impacting post-secondary institutions in Ontario and across Canada.

Transfer in Ontario

Publicly available transfer data to assess overall volumes and trends remain somewhat limited for within Ontario, likely due to the challenges with identifying transfer students in a systematic way.⁷¹

ONCAT and OCAS, with OUAC's support, led a project to examine the volume and patterns related to electronic transcript exchange over two time periods: 2015 and 2016 (Table 2).⁷² While focused on the transcript exchange itself, these findings provide proxy indicators of the volume of students seeking to transfer between Ontario post-secondary institutions. Close to 70% of the transcripts transferred in each cohort year went to colleges (see blue shading in Table 2). This was true whether the student was requesting past university or college transcripts.

While the dataset between the above and those of student applicants in Figure 9 are not the same, the number of transfer applicants to Ontario universities suggest some degree of alignment with the above data. The year-over-year change in transfer applicant volume to Ontario universities using data from OUAC and other institutions indicates significant, although declining, numbers of applicants and

⁷¹ Beginning in 2015, the Ontario government implemented an enrolment reporting identifier (called the Credit Transfer Flag) to monitor transfer volume in the province (Ministry of Training, Colleges and Universities, 2015-16). Colleges and universities assign the Flag if a student is awarded at least one course in transfer (pp. 86-87). As it only applies to those who have received transfer for courses from an Ontario post-secondary institution, students who have studied solely in out-of-province or international post-secondary institutions aren't represented unless they previously took a course in an Ontario post-secondary institution. The implementation of the Ontario Education Number (OEN) plus this Flag hold the potential to begin to develop the data set needed to understand the transfer trends in the province. Such information would be critical to enable change and enhance institutional efficiencies and services to students. The research indicated the Flag is applied to the student files after much of the admissions and transfer work is completed as part of the institutional reporting required for enrolment funding.
⁷² <u>http://www.oncatconference.com/2018/documents/papers/A4.pdf</u> Note: not all transcript exchange volume occurring in the province is captured in this data.

increases in registrants into Ontario universities (Figure 9).⁷³ The in-year percentage of university registrants to applicants grew from 17% in 2012 to 20% in 2016, potentially suggesting improved efficiencies of some nature. Previous college research indicates similar increases in applicants (13%) and registrants (11%) who had prior university experience before entering an Ontario college (Colleges Ontario, 2009).

As noted above, institutional representatives in Ontario consulted for this research indicated out-ofprovince, international, and, for some institutions, in-province transfer required manual assessment even with the existence of electronic transcript exchange between post-secondary institutions in the province to support admissions. This reality is validated in other research and primarily impacts the transfer credit assessment process for both domestic and international students (Duklas, January 2019). While larger institutions tended to have developed internal practices (including automation) to enhance institutional assignment of transfer equivalencies, the consultation for this research suggests that this is not the case for all Ontario institutions.

Given these data and the previously noted increases in international transfer, future research examining overall transfer volumes (intra-provincial, inter-provincial, and international) would be very useful to understand the gaps in student service and the true volumes impacting post-secondary institutions in Ontario and across Canada. The consultation findings from this research suggest the need for change to provide sustainable supports for post-secondary institutions.

	201	5	20)16
Type of Transcript Transfer Exchange	Transcripts Sent Percentage		Transcripts Sent	Percentage
College to university	22,317	17	21,916	17
College to college	38,547	30	38,605	31
University to university	17,699	14	17,474	14
University to college	49,138	38	47,249	38
Column Totals	127,701	100%	125,244	100

Table 2: Ontario Transcript Exchange Volumes

FN 2: adapted from http://www.oncatconference.com/2018/documents/papers/A4.pdf

⁷³ Source: OUAC and data provided by some universities per CUDO -

https://cudo.ouac.on.ca/page.php?id=7&table=10#univ=1,2,3,8,9,11,12,14,16,17,21,22,23,24,25,27,28,29,30,31,32,33,34,42&y=2016





			Registrants as a % of
	Applicants	Registrants	Applicants
2016	32809	6433	20%
2015	33255	5600	17%
2014	33604	5358	16%
2013	32209	5176	16%
2012	35088	5976	17%

National Connectivity

Previous ARUCC research,⁷⁴ interviews, and website research highlight the student data exchange strengths and gaps in the different jurisdictions across Canada (Appendix F). Thematically, the research indicates that the following areas require resolution, most of which apply to Ontario except for <u>intra</u>-provincial application and transcript exchange for admissions.

- No electronic exchange of official transcripts offering machine readable data exists with trusted international organizations and institutions in other countries beyond a select few institutions.
- No inter-provincial electronic exchange of official transcripts with machine-readable data exists in any province or territory except on a limited basis in Ontario (OUAC is exchanging with 11 institutions in various provinces and with two BC institutions through EducationPlannerBC), and between Québec and OUAC and La Cité for CEGEP results.
- No member-led capacity at the provincial or national levels exists to officially and electronically confirm a student's current or former status.⁷⁵ Examples of documents affected by this and dealt with manually in most instances include confirmations of offer, enrolment (full/part-time students), fees paid, pending graduation, and graduation.
- Limited national resources exist to support admissions and transfer in various parts of Canada although seven provinces including Ontario through ONCAT, provide transfer supports including online course equivalency and pathway guides.⁷⁶
- No system-wide intra- or inter-provincial electronic high school or post-secondary transcript exchange offering machine-readable data exists in Manitoba, Newfoundland and Labrador, Northwest Territories, Nunavut, or Prince Edward Island. No post-secondary transcript exchange with machine-readable data exists in Saskatchewan as well.

⁷⁴ http://arucc.ca/en/project-overview.html

⁷⁵ Select institutions use third-party vendors to support out-bound document and graduation validation; however, this functionality is not universally available to all institutions.

⁷⁶ ARUCC and PCCAT partnered to create and launch the national transcript and transfer guide, which provides an exemplar model for national tools to support transfer (guide.pccat.arucc.ca).

Section 5.0 provides further findings of gaps which validates much of the above research conducted by ARUCC.

Overview of Privacy Regulations

The federal and provincial privacy regulations⁷⁷ and the *European Union General Data Protection Regulation* (GDPR)⁷⁸ establish the regulatory framework for Canadian post-secondary institutions, application centres/data hubs, ARUCC, and the national data exchange network. According to the consultation for this project, organizationally specific data sharing agreements and privacy and consent of use protocols and statements add an additional layer to support transparent and permission-based student data exchange. While a broad analysis of privacy regulations remains outside the scope of this research, identifying the privacy statutes to which Ontario post-secondary institutions and application centres are subject remains relevant.

In Ontario, the Freedom of Information and Protection of Privacy Act (FIPPA)⁷⁹ applies to public organizations in the province which include government and provincially funded post-secondary institutions (Information and Privacy Commissioner of Ontario, 2014). Under FIPPA, the Information and Privacy Commissioner of Ontario (IPCO) provides oversight for the Act (Information and Privacy Commissioner of Ontario, n.d.) and is formally mandated to investigate and resolve appeals and complaints, ensure compliance, review practices, conduct research, educate the community about privacy, and provide the public access to government-held information and the public's own information. The IPCO leads meetings/information sessions and produces several resource guides to help with interpretation of FIPPA. For example, it provides instructions on disposal of electronic media which may be relevant to the national network depending on the model chosen (2018). Unlike the other publicly funded post-secondary institutions, the Royal Military College, a federally funded and provincially chartered associate member of the Council of Ontario Universities (COU),⁸⁰ adheres to the federal regulation called *The Privacy Act*.⁸¹

The two Ontario application centres, OUAC and OCAS, follow the federal Personal Information Protection and Electronic Documents Act (PIPEDA)⁸² as they are separately incorporated not-for-profit entities. OUAC is registered as a private charity (James & McMillan, 2016). As with the application centres and data hubs operating in other provinces, OUAC and OCAS serve as exemplars for managing personal information in accordance with the various acts.⁸³ OUAC's publicly available privacy practices are described further below to illustrate an Ontario specific model.⁸⁴ OCAS's privacy policy, privacy code, and terms of use are available publicly as well.⁸⁵

⁷⁷ The federal government links to all the Canadian and provincial privacy regulations at the following URL:

https://www.priv.gc.ca/en/privacy-topics/privacy-laws-in-canada/02_05_d_15/

⁷⁸ https://ec.europa.eu/info/law/law-topic/data-protection/data-protection-eu_en

⁷⁹ https://www.ontario.ca/laws/statute/90f31

⁸⁰ <u>https://cou.ca/members-groups/members-of-council/</u>

⁸¹ <u>https://www.priv.gc.ca/en/privacy-topics/privacy-laws-in-canada/the-privacy-act/;</u> more information about *The Privacy Act* available here: <u>https://www.canada.ca/en/employment-social-development/corporate/transparency/service-canada.html</u> ⁸² http://laws-lois.justice.gc.ca/eng/acts/P-8.6/index.html

⁸³ EducationplannerBC = <u>https://www.educationplannerbc.ca/content/privacy</u>; ApplyAlberta =

https://www.applyalberta.ca/privacy-policy/; MyNSfuture.ca = https://www.mynsfuture.ca/privacy-policy ⁸⁴ https://www.ouac.on.ca/privacy/

⁸⁵ <u>https://www.ontariocolleges.ca/en/</u> - Search 'privacy' to access the privacy policy, privacy code, and terms of use on the OCAS Inc. website.

OUAC's approach includes publishing an overall privacy statement and links to specific declaration and notice statements for the secondary school audience, the graduate audience, and more. The overall privacy statement includes the following:

- the information collected (both personal and technical);
- how data is used and where it is disclosed and transferred;
- how personal information is protected and access to personal data supported;
- third-party disclaimers;
- change protocols (including the process for the applicant to follow to change personal information); and,
- who to contact for questions, comments, changes, or complaints.

Using the secondary school audience as an example, the publicly available declaration and notice linked to the above privacy statement and tied to each personal application explains OUAC's purpose including the services it provides to students applying to Ontario public post-secondary institutions from secondary school.⁸⁶ It explains the following:

- what personal information is collected;
- why it is collected;
- how it is used;
- who or what entity has access to it;
- what information is or is not mandatory;
- the applicant's responsibilities; and,
- what is disclosed.

The declaration and notice presented to applicants also requires their formal consent, verification, and agreement which is captured as part of the online application process. A privacy officer contact is provided for those with additional questions.

The European GDPR contains clauses which extend its reach beyond Europe to companies located in other parts of the world who are directly marketing to and capturing personal information from European citizens.⁸⁷ The GDPR regulation and its meaning are fully explained on the European Commission's website including what is required in a Notice of Use.⁸⁸ It is inappropriate in the context of this paper to provide interpretations of the statute; however, further legal advice would be needed for the national network to better understand its obligations, if any, related to the GDPR as this may impact Ontario post-secondary institutions and application centres.

Educause, a non-profit organization for higher education information technology staff, provides best practice advice across a range of areas including privacy and data protection. It advises creating data sharing agreements between all partners involved in a student data exchange network to articulate roles, responsibilities and obligations (Educause, n.d.). For Ontario, that would at minimum mean

⁸⁶ <u>https://www.ouac.on.ca/privacy/101-declaration/</u>

⁸⁷ <u>https://ec.europa.eu/info/law/law-topic/data-protection/reform/rules-business-and-organisations/application-regulation/who-does-data-protection-law-apply_en</u>

⁸⁸ <u>https://ec.europa.eu/info/law/law-topic/data-protection/reform/rules-business-and-organisations/principles-gdpr/what-information-must-be-given-individuals-whose-data-collected_en</u>

between the application centres and the national network. If any direct connections were established with individual institutions, data sharing agreements would likely be necessary.

The national network and its service providers must adhere to the federal and provincial privacy regulations including but not limited to the Freedom of Information and Protection of Privacy Act (FIPPA), The Privacy Act, and the Personal Information Protection and Electronic Documents Act (PIPEDA). Adherence to the European Union General Data Protection Regulation (GDPR) is also likely necessary, where relevant.

Fraud and Security

Document and Identity Fraud

It remains difficult to quantify the scope of the post-secondary document fraud challenge in Canada as systematic sector level identification and monitoring does not exist, a situation which is not unusual in other jurisdictions (Tobenkin, 2011). The World Education Services, an international credential evaluation organization, provides further information on the scope of the problem, which demonstrates academic document fraud is not unique to Canadian post-secondary institutions (Trines, 2017). Western Kentucky University, one of the examples cited, de-enrolled 25 of close to 60 students in a recent case due to admissions fraud (Saul, 2016). Potentially increasing examples of document fraud are emerging in Canada (Zavarise, 2018), (Rankin, 2016), (Giles & Craig, 2018). For example, a recent article published by the CBC reports an increase from 10 students submitting fraudulent documents in 2015-16 to close to 50 in 2017-18 at one institution alone (Zavarise, 2018). To put this into perspective, if a university or college uncovered 50 enrolled students who had committed admissions fraud and subsequently de-enrolled them after the drop date, the total annual revenue loss would be close to \$1 million.⁸⁹

The nature of the fraud varies from academic transcripts and related documents that are altered or created, fake diplomas, and interpretive translations of existing documents (which sometimes unintentionally misrepresent results) (Adan, n.d.). Furthermore, fraud impacting post-secondary institutions is not limited to education documents but also extends to work permits, bus passes, and more (Schmidt, 2018).

To combat fraud, Immigration, Refugees and Citizenship Canada (IRCC) maintains strict criteria for controlling who may support those wishing to study, work, or live in Canada.⁹⁰ According to this research, Canadian post-secondary institutions work closely with IRCC, Canadian Border Services, and others to ensure compliance and reduce academic document fraud.

Document fraud relates to identity fraud in that institutions need to ensure that the person applying, enrolling, and subsequently claiming an academic document as theirs is legitimate. This issue is shared with other industries. A Telus study reported billions of dollars in costs to Canadians due to online fraud

⁸⁹ Tuition fees vary by institution. This calculation is based on \$15,000 undergraduate tuition per year for an international student on study permit. It assumes de-enrolment happened after the start of classes and the tuition deadline. According to the consultation for this research, institutional representatives reported that it is extremely difficult to allocate an enrolment seat to another person after the start of classes and subsequently recoup losses in tuition revenue.

⁹⁰ <u>https://www.canada.ca/en/immigration-refugees-citizenship/services/immigration-citizenship-representative/learn-about-representatives.html</u>

and related crimes with a 25% increase in exposed identities in 2015 alone (Canadian Bankers Association, 2018).⁹¹ To address identity fraud, the Canadian Bankers Association (CBA) and its leadership have been advocating for government support to create a *Digital Identity System* (2018). As part of this effort, the CBA is seeking government support for accepting digital identities by using innovative technologies and approaches, including blockchain (Parmenter, 2019).

In the postsecondary sector, fraud represents a growing issue requiring institutional registrarial and information technology departments to carefully manage student identification and authentication processes to ensure safe and secure access to student records and data housed within institutions (Canadian University Council of Chief Information Officers (CUCCIO), n.d.). Many Canadian post-secondary institutions participate in the *Eduroam* network, which allows students, staff, and faculty to access information through a federated framework using institutionally controlled and managed identities and permission capture.⁹² As a result, the higher education community maintains access to important information regardless of location. This is one illustrative example of the options available for identity management.

Creating direct, trusted connections for document exchange supported by a robust identity management framework means greater efficiencies and stronger data security for a national student data exchange network. Document and identity fraud mitigation strategies remain critically tied for whatever final solution is chosen.

Data Security

The participants in the regional meetings and interviews for this project continually raised the issue of data security. This is to be expected as protecting student data represents a critical concern and focus in higher education (Shipley, 2015) (Educause, 2019a). In response to a growing focus on student success, Educause, an American based non-profit organization focused on higher education information technology, is leading the *Student Genome Project* which is concerned with advising institutions across several fronts including data security, ethical data stewardship, interoperability, standards, and data management and governance (2019b). For data security and integration, Educause suggests addressing several areas when expanding connectivity with outside organizations including vendor management, contracts, service level agreements, and data flows and architecture (Gower & Hartman, 2019c). The *ARUCC Groningen Project's* national technical advisory committee of data exchange experts from across Canada represents an example of ensuring this focus. This group is guiding the technical aspects of purchase and implementation of the national network. Members of this committee include representatives from Ontario institutions.⁹³

Best practice advice provided by the National Student Clearinghouse, Educause, and REN-ISAC in their report, *Why Cybersecurity Matters* provides specific suggestions for service contracts for data exchange projects to address these areas (2018). These include the following:

 breach notification schedules and incident response plans, defined data access roles, independent security assessments, data sharing notifications, security training expectations, and protocols for addressing security patches;

⁹¹ https://www.itworldcanada.com/sponsored/demystifying-digital-identity-a-matter-of-trust

⁹² https://www.eduroam.org/about/institutions/

⁹³ <u>http://arucc.ca/en/project-governance.html</u>

- a risk identification plan that addresses connection points with accountabilities noted for issue resolution and risk mitigation;
- automated update schedules to address connections at 'Endpoints'; ⁹⁴ and,
- multifactor authentication.95

Educause provides a comprehensive tool for assessing vendors' capacities for security and data protection (2019c). While written for the US context, it holds potential for use with the Canadian national network.

Overview of Data Exchange Models

A detailed technical review and summary of data exchange models sits outside the scope of this research; however, a brief overview is provided to illustrate the typology and highlight exemplar models in place around the world. Those of potential relevance to the national network are described below and include five types: *repositories, exchange networks, badging frameworks, blockchain,* and *hub and spoke* (Dowling, 2018a).⁹⁶

The *repository* model involves student data being centrally stored with access overseen, managed, and curated by a central agency. The China Higher Education Student Information and Career Center (CHESICC) represents an example of this model. CHESICC, a trusted international organization, stores Chinese qualification certificates, enrolment status, Gaokao results, and student photos in a central database.⁹⁷ As one example of its use in Canada, McGill University has established a connection to the CHESICC database facilitated by the National Student Clearinghouse (the *Clearinghouse*) to ensure access to official documents for Chinese applicants (Duklas, January 2019). Students apply to McGill and provide permission for the documents to be exchanged. CHESICC is notified and sends these to McGill via the *Clearinghouse* for a fee. The documents are official as they go directly from the Chinese repository to McGill.

An *exchange network* represents another model which involves a system-to-system (institution to institution) transfer of information directly between two organizations using APIs and other methods (Dowling, 2018a). In the post-secondary context, this model involves sending documents or student information directly between institutions without the involvement of students. It is typically a closed and trusted method, although it is possible for students to push documentation through the network by accessing other systems that are connected to the network (Chakroun & Keevy, 2018).

Badging Frameworks are considered another type of model for exchanging student information and credentials (Hickey & Otto, 2017). With this approach, students receive electronic symbols called badges that signify successful completion of a learning outcome, topic, or subject area. Typically, these are web enabled and contain metadata that facilitate access to more information about what the badge was awarded for, by which organization, the assessment criteria, the evidence of achievement, issuance date, and other data (Open Badges, 2016).

⁹⁴ Endpoint: "any piece of computer hardware with an internet connection....[e.g.,] desktop computers, laptop computers, tablets, smartphones, and other devices." (National Student Clearinghouse, Educause, REN-ISAC, 2018)

⁹⁵ Multifactor authentication: "a system that relies on more than one layer of security to authenticate a user." (National Student Clearinghouse, Educause, REN-ISAC, 2018)

⁹⁶ Sources for information on models: (Dowling, 2018a), (Dowling, 2018b)

⁹⁷ <u>https://www.chsi.com.cn/en/aboutus/database.jsp</u>

Blockchain represents another method institutions and governments are using to enhance portability of credentials (Patel, 2018) (The Nassau Guardian, 2018) (Purushotham, 2018).⁹⁸ Two Canadian examples include the work of the federal government, which is piloting and exploring applications for blockchain, (National Research Council Canada, 2018) and the credentialing efforts at the Southern Alberta Institute of Technology (SAIT). It became the first institution in the country to launch credentials through a blockchain (Southern Alberta Institute of Technology, December 17, 2018). Internationally, the European Commission has created a consortium called the EU Blockchain Conservatory and Forum, which is focused on monitoring, mapping, and inspiring collaborations and conversations for blockchain (European Commission, 2019). To date, the EU has provided 83 million Euros to related projects and intends to do more in this area. More broadly, the EU is supporting extensive research and innovations through the European Research Cluster on the Internet of Things (IOT), which goes beyond blockchain and focuses on "coordinating and building a broad based consensus on the ways to realise the Internet of Things vision for Europe" (Internet of Things, 2016). The focus is multi-layered and complex. Of relevance to credential exchange is enhancing control of personal data, eliminating intermediaries, designing user-led systems that support data protection and privacy, facilitating digitization, addressing ways to better manage the resulting plethora of data, and ensuring interoperability (Vermesan & Bacquet (eds), 2017). Blockchain is not a fully viable option for the Canadian national network because it lacks the capacity to support data processing and exchange. It does, however, present interesting options for augmenting services in that it provides more immediate access for students to their credentials for the purposes of employer verification of official documents.

Another model for exchange is referred to as the *hub and spoke* (Dowling, 2018a). This model is very common in Canada between application centres and institutions. The My eQuals in Australia and New Zealand uses this approach for post-secondary student data exchange.⁹⁹ In that example, institutions maintain control over the data housed in their student information systems and in an institutionally specific partitioned cloud. Students access their portal in My eQuals which allows them to see their official records and share them with others (Dowling, 2018a).

Some of the credential and student data exchange networks currently used do not appear to neatly fall into one model or combine models. For example, EMREX, a European project that facilitates learner driven exchange, might be characterized as a network in that it is supported by a trusted network of institutions that are interconnected. It might also be considered a hub and spoke because the students drive the exchange, which is supported by a national or regional server called a *National Contact Point*.¹⁰⁰ In essence, it is a trusted business-to-business model supported by a regionally located hub where the learner drives the exchange and determines what happens with their data. For example, assuming the institutions have coded all the relevant business rules, the network holds the capability for students to access their former institution's student information system, identify courses previously taken, move their data through the network, deposit it into the student information system of their new destination institution, and have transfer credit automatically reflected in their new student record and transcript (Duklas, January 2019).

⁹⁸ Exploring blockchain falls outside of the scope of this research. Those interested learning more about this model are encouraged to review Dowling's helpful overview in *Blockchain Position Paper* (2018b). His work focuses on analyzing the public blockchain model.

⁹⁹ https://www.myequals.edu.au/

¹⁰⁰ http://www.emrex.eu/

Many of these models facilitate the exchange of various data formats and documents including in PDF, which Canadian post-secondary institutional representatives (including those in Ontario) suggested would make sense for early implementation of a national network. The American registrars' association, AACRAO, provides best practice advice for PDF transcript exchange which addresses security, rights management, and accepting secure PDFs as official if they are digitally certified/encrypted (2018). The Post-Secondary Electronic Standards Council (PESC) provides a data standard format for supporting PDF to support secure exchange.¹⁰¹

For those interested in exploring the various models, Chakroun and Keevy (2018) provide a very thorough overview in *Digital Credentialing: Implications for recognition of learning across borders* which is adapted from Dowling's work (2018a). They outline the typology of possibilities for consideration by the Canadian higher education community.

¹⁰¹ <u>https://www.pesc.org/pesc-approved-standards.html</u>

Section 4.0 - Findings: Current State – Student Data Exchange

The primary research through the survey, interviews, and regional meetings sought to identify the current practices supporting student data exchange in Canada with a focus on Ontario. The following section identifies the Ontario findings and contrasts these against the relevant national findings. Appendix G provides a brief overview of the survey demographics and additional supplementary findings.

For the survey, Ontario colleges, institutes, and universities made up 47% of a total pool of 86 institutions which represents the largest group in comparison to any other province.¹⁰² Of these, 33% represented colleges/institutes (10/24) and 66% represented universities (14/21).¹⁰³ This final pool represents 49% of the Ontario publicly funded institutions (22/45).

Current Data Exchange Practices

Ontario Data Exchange Partners

As mentioned previously, OUAC and OCAS support and enable the Ontario application processes for admissions and transcript exchange and provide extensive supports surrounding these activities. For example, both organizations provide online application portals through which students apply to more than one Ontario post-secondary institution simultaneously. The centres subsequently transfer the student data to Ontario's post-secondary institutions. In addition, both centres support electronic transcript exchange from Ontario high schools to Ontario's post-secondary institutions, and between Ontario post-secondary institutions for the purposes of in-province admissions. Both OUAC and OCAS provide extensive information resources for students. For example, OCAS partnered with *myBlueprint*¹⁰⁴ to augment the educational resources offered students through provincial high schools across Canada and OUAC manages *elnfo* (an online resource for students) in collaboration with the Ontario universities. It also supports the provincial university information program and the Ontario Universities' Fair (OUF), which is touted as one of Toronto's largest trade fairs.¹⁰⁵

OCAS recently launched the *International Application Service (IAS)* to participating colleges. This system offers three portals to support "automated offer and communications processes, secure data exchange with college Student Information Systems, and analytics."¹⁰⁶ It also facilitates the submission of PDF documents for international students applying to study in participating Ontario colleges.

OUAC provides centralized application services for undergraduate, graduate, and professional programs (i.e., for law, medicine, rehabilitation sciences, and education). It also facilitates transmission of test

¹⁰² http://arucc.ca/en/projects/task-force-groningen.html

¹⁰³ All the Ontario post-secondary institutions and OUAC, OCAS, and ONCAT were invited to participate in the survey, interviews, and regional meetings. Although 24 Ontario post-secondary institutions participated in the survey, contradictory responses were received for current practices by one institution; therefore, at times these results are excluded to ensure one clear response per institution. As the same issue arose with two other institutions from outside Ontario, these were also excluded from analyses regarding current state. The final dataset of 99 unique organizations (of which 86 were institutions) informed the current practice findings for the national figures and charts in this section. 'N' counts are adjusted and noted throughout to accommodate these issues. Not all results will equal 100% due to rounding.

¹⁰⁴ <u>https://www.myblueprint.ca/</u>

¹⁰⁵ <u>http://www.ouf.ca/</u>

¹⁰⁶ <u>https://www.ocas.ca/who-we-are/press/ocas-launches-new-ias</u>

score results to Ontario universities from US-based organizations (e.g., Law School Admission Test Scores,¹⁰⁷ Medical MCAT scores,¹⁰⁸ etc.).

ONCAT, Ontario's centralized transfer pathway organization, seeks "to enhance academic pathways and reduce barriers for students looking to transfer among Ontario's colleges, institutes, and universities."¹⁰⁹ Its members include all the publicly funded post-secondary colleges and universities in the province. While ONCAT does not exchange individual student data or documents, it provides students and institutions an online environment supported by three systems to enhance access to course equivalencies and pathway information. Students use an online portal within the ONCAT system to capture self-loaded information to enhance their course equivalency search process. Institutions load pathway and equivalency information to the ONCAT environment to facilitate student plan and search activities related to transfer.

Sending and Receiving Practices

Ontario

Ontario post-secondary institutions reportedly engage in electronic document exchange across the entire student life cycle which covers the period prior to admissions and through to and beyond graduation (Figure 10). However, not all of it is being transmitted in a machine-readable format which limits data exchange, processing, and subsequent automation opportunities. According to the survey findings, the most common information being *received* electronically by Ontario post-secondary institutions includes transcripts (secondary = 91%, post-secondary = 91%), admissions related information (91%), financial aid information (78%), and language proficiency results (65%). Less commonly *received* are diplomas (30%), graduate confirmation (22%), proof of enrolment (17%), co-curricular information (9%), and other documents (0%).

Ontario institutions reported electronically *sending* documents such as admissions information (83%), post-secondary transcripts (74%), financial aid information (83%), confirmations of graduation (61%), proof of enrolment (43%), and diplomas (39%) (Figure 10). Less commonly *sent* to outside third parties are secondary school transcripts (13%), language proficiency results (4%), and other information (4%). None are electronically distributing co-curricular information (0%). According to the research, Canadian post-secondary institutions tend to avoid distributing any documents or data they've received from other third-party organizations; therefore, the sending results for secondary school transcripts and language proficiency information are to be expected.

Differences exist between colleges/institutes and universities (Table 3). It appears that a higher proportion of colleges/institutes *send* electronic student information than universities across most categories of information. They appear to *receive* less student information electronically than universities in areas such as admissions, co-curricular, diploma, language proficiency, and transcripts.¹¹⁰

The two application centres reported *sending* admissions information, *sending* and *receiving* transcripts (both secondary and post-secondary), and *receiving* proof of enrolment information. One reported

¹⁰⁷ https://www.ouac.on.ca/guide/olsas-lsat-requirements/

¹⁰⁸ <u>https://www.ouac.on.ca/guide/omsas-mcat/</u>

¹⁰⁹ <u>https://oncat.ca/en/about-us</u>

¹¹⁰ As the 'n' counts are small when data are split between the Ontario colleges/institutes and universities, subsequent analysis combines institutional type.

sending co-curricular information,¹¹¹ diploma information, proof of enrolment, and other information to support professional and graduate application processing. Examples provided of other information *received* and *sent* by OUAC include LSAT scores, MCAT scores, self-reported test results (GRE, GMAT, etc.), supporting documentation (PDF), university decision data, applicant response to offer data, and statistical data (both operational and historical).

The data exchange formats used by Ontario institutions vary (Figure 11). Most institutions use XML, EDI, and Flat File formats; however, a significant percentage reported *receiving* and *sending* PDFs (57% and 35% respectively). Colleges appear to rely less on PDF documents than the universities (Table 4).

For those institutions that send and receive electronic data, 70% reported in-house capacity exists to transfer data from one format to another without changing the original content (16/23) in contrast to the national finding of 44% (38/86). This represents an important strength when considering Ontario post-secondary capabilities for onboarding to a future national data exchange network.

The Ontario application centres exchange data in a variety of formats and reportedly maintain the capacity to transform electronic data formats (e.g., EDI to XML). In the qualitative consultations, institutions and application centres reported moving from EDI to XML and using different versions of XML. The latter presents challenges for flexible data exchange and interoperability. It will be important to leverage the centres' capacities in this area.





¹¹¹ Since co-curricular records are not currently exchanged electronically by Canadian application centres, follow up clarification provided by one application centre survey participant who had noted this response indicated that they understood 'co-curricular' to mean non-academic supplemental information provided in the online application form.

	Col	Colleges/Institutes (n=9)				Univer	sity (n=14	4)	Total PSI Responses (n=23)				
	Se	nd	Receive		Se	Send		Receive		Send		Receive	
Co-curricular	0	0%	0	0%	0	0%	2	14%	0	0%	2	9%	
Admissions	8	89%	8	89%	11	79%	13	93%	19	83%	21	91%	
Diploma	5	56%	2	22%	4	29%	5	36%	9	39%	7	30%	
Financial Aid	8	89%	7	78%	11	79%	11	79%	19	83%	18	78%	
Graduate Confirmation	6	67%	2	22%	8	57%	3	21%	14	61%	5	22%	
Post-secondary Transcript	8	89%	8	89%	9	64%	13	93%	17	74%	21	91%	
Language Proficiency	1	11%	3	33%	0	0%	12	86%	1	4%	15	65%	
Proof of Enrolment	4	44%	2	22%	6	43%	2	14%	10	43%	4	17%	
Secondary School Transcript	2	22%	8	89%	1	7%	13	93%	3	13%	21	91%	
Other	0	0%	0	0%	1	7%	0	0%	1	4%	0	0%	

Table 3: Student Information Exchanged Electronically by Type of Institution – Ontario Survey Findings





Table 4: Data Exchange Formats used by Ontario Institutions

	Colleges/Institutes (n=9)				Unive	ersity (n=	14)		Province Overall (n=23)			
	For S	or Sending For Receiving F		For S	For Sending For Rec			ving For Sending			For Receiving	
EDI (ANSI X12)	6	67%	6	67%	9	64%	10	71%	15	65%	16	70%
Flat File	7	78%	6	67%	11	79%	10	71%	18	78%	16	70%
JSON	0	0%	0	0%	1	7%	0	0%	1	4%	0	0%
PDF	2	22%	2	22%	6	43%	11	79%	8	35%	13	57%

	Colleges/Institutes (n=9)				Unive	ersity (n=	14)		Province Overall (n=23)			
	For Sending For Receiving F		For Sending		For Receiving		For Sending		For Receiving			
PDF/A	0	0%	0	0%	0	0%	2	14%	0	0%	2	9%
PESC XML	4	44%	4	44%	4	29%	5	36%	8	35%	9	39%
XML	8	89%	6	67%	6	43%	7	50%	14	61%	13	57%
Other	1	11%	1	11%	1	7%	0	0%	2	9%	1	4%

National

As with Ontario, most of the student data exchange (sending and receiving) occurs intra-provincially. A limited amount of inter-provincial exchange is occurring, primarily involving OUAC in Ontario, EducationPlannerBC in British Columbia, ApplyAlberta in Alberta, and the Bureau de coopération interuniversitaire in Québec. Additionally, Nova Scotia, New Brunswick, and Saskatchewan are pursuing plans to expand inter-provincial exchange with select Canadian jurisdictions.

Most of the Canadian post-secondary institutions reported *receiving* student information electronically in the following areas (Figure 12): as transcripts (high school = 70%; post-secondary = 67%), and for admissions (63%), financial aid (60%), and to satisfy language proficiency (44%).¹¹² Similarly, most reported *sending* post-secondary transcripts (63%), admissions information (69%), financial aid information (67%), proof of enrolment (49%), graduation confirmation (58%), and diploma related information (47%).

The format used for data exchange varies across Canada.¹¹³ While significant exchange occurs using XML, EDI, and Flat File formats, a notable percentage reported sending and receiving student information using PDF (44% and 49% respectively). This finding aligns with what appears to be happening in Ontario.

¹¹² These findings include the Ontario post-secondary responses.

¹¹³ http://arucc.ca/en/projects/task-force-groningen.html



Figure 12: Student Information Sent and Received Electronically by Canadian Post-secondary Institutions

Outgoing Document Validation: Confirmation of Enrolment Status and Credential Completion *Ontario*

Just over half of the Ontario post-secondary institutions reported *not offering* online enrolment status verification (52%) or credential verification (57%) services (Tables 5 and 7).¹¹⁴ Others reported using either in-house designed automated systems on institutional websites,¹¹⁵ or third-party vendors (in both cases for online credential verification only). Neither of the application centres provide supports in these areas likely due to their focus on the application and admissions areas. While lower than the national percentages, these findings suggest a significant amount of manual effort exists in Ontario colleges, institutes, and universities to support confirmations of status and/or graduation.

National

Similarly, most Canadian institutions surveyed across colleges, institutes, and universities indicated that they *do not offer* online enrolment (60%) or graduation (77%) verification services for students (Tables 5 and 6). The same is true of application centres across Canada. When Ontario results are excluded, the gap in other provinces and territories climbs higher. These findings represent significant gaps as they illustrate the lack of electronic capacity to validate official documents or student status after the point of admission and the manual effort occurring to address these requests from students and third parties.

As noted in Section 3.0, post-secondary institutions across Canada are seeing increasing volumes of these requests across a host of areas including when validating official offers of admission granted to international students with Canadian Immigration, Refugee and Citizenship (IRCC) and Canadian Border Services, confirming official status of enrolment to third parties such as providers of Registered Education Savings Plans (RESPs) and health care providers, and officially confirming pending or successful completion of graduation to employers, regulatory bodies, and others.

¹¹⁴ Institutions were permitted to choose more than one provider.

¹¹⁵ Examples of institutional online credential verification systems: <u>https://registrar.yorku.ca/graduation/yuverify</u> and <u>https://ss.cf.ryerson.ca/degreeverification/</u>

Table 5:	Online	Fnrolment	Verification	Services	Provided -	– Post-secondary	Institutions
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Service Offered?	Alberta	British Columbia	Ontar	Ontario		Other Provinces & Territories	All of witho (n=63)	Canada ut Ontario)	All of Ca includin (n=86)	inada g Ontario
No response	0	1	1	4%	2	0	3	5%	4	5%
Not available	9	8	13	57%	14	8	39	62%	52	60%
Yes, available in-house	4	7	9	39%	4	3	18	30%	27	31%
Yes, provided by an external third-party service	0	1	0	0%	2	0	3	5%	3	3%
Column Totals	13	17	23	100%	22	11	63	100%	86	100%

Table 6: Online Credential Verification Services Provided – Post-secondary Institutions only

Service Offered?	Alberta	British Columbia	Ontar	io	Québec	Other Provinc Territories	All of witho (n=63	Canada ut Ontario)	All of includ Ontar	Canada ling io (n=86)
No response	0	1	1	4%	2	0	3	5%	4	5%
Not available	13	14	12	52%	16	11	54	86%	66	77%
Yes, available in-house	0	1	3	13%	2	0	3	5%	6	7%
Yes, provided by an external third-party service	0	1	7	30%	2	0	3	5%	10	12%
Column Totals	13	17	23	100%	22	11	63	100%	86	100%

International Connectivity

Ontario

In the survey, 11 Ontario universities and OUAC reported exchanging student information with trusted international organizations to support admissions.¹¹⁶ The post-secondary institutions represent 35% (11/31) of those from across Canada who reported trading relationships with trusted international entities and 48% of the 23 Ontario institutions that participated in the survey.¹¹⁷ Within these 11, variety exists:

- one Ontario post-secondary institution reported receiving student information directly from CHESICC in China;¹¹⁸
- three reported accessing results from the US-based National Student Clearinghouse described earlier in the report;¹¹⁹
- two work with ScripSafe, which offers diploma distribution services;
- five access results from the US-based College Board (i.e., Advanced Placement and SAT results);¹²⁰

¹¹⁶ In the context of this report, *trusted international organizations* include those that are recognized institutions, government mandated, or designated by recognized institutions in their home country as the official source for students' credentials; for this research and the national project, recruitment agents are not categorized within the definition of *trusted organizations* although it is understood that institutions use recruitment agents.

¹¹⁷ Responses for one Ontario institution excluded due to contradictory responses on current practices.

¹¹⁸ https://www.chsi.com.cn/en/

¹¹⁹ https://studentclearinghouse.org/

¹²⁰ <u>https://www.collegeboard.org/</u>

- five access results from the International Baccalaureate Organization;¹²¹
- six reportedly use Parchment for diploma distribution, a transcript and credential distribution provider;¹²² and,
- three receive documents from other international entities (with no further details provided).

No colleges reported any international trading relationships with these types of organizations. Most of the above-mentioned organizations support the admissions process with incoming academic results or testing data although some also offer out-bound distribution of documents for Canadian institutions.

As mentioned previously, OCAS recently launched the *International Application Service* which supports international admissions and international third-party agents who recruit students for the Ontario colleges. OUAC reported engaging in international exchange with trusted entities to support select application processes (e.g., to access test scores for admission to medicine and law).

National

Thirty one percent (31/99) of the Canadian post-secondary institutions, application centres, and data hubs reported engaging with third-party international organizations to exchange student data, in all cases to support the admissions process (Table 7).¹²³ Most reported using these external providers to access academic results for studies completed in other countries as a support to the admissions process. Some are relying on these organizations for outward bound academic documents (i.e., transcripts, diplomas).

Trusted International Organizations	Receive	Send	Plan to Send or Receive	Don't Know/Not	Row Total
				Applicable	
CHESICC (China)	2 institutions		1 institution; 1 application centre	95	99
My eQuals (Australia/New	1 institution		1 application centre	97	99
Zealand)					
GradIntelligence (UK)	1 institution		1 application centre	97	99
National Student	13 institutions; 1	2 institutions	3 institutions	83	99
Clearinghouse (US)	application centre				
Credentials ScripSafe	7 institutions; 1			91	99
	application centre				
College Board (US)	12 institutions; 1		2 institutions	84	99
	application centre				
Credential Solutions (US)	2 institutions		1 application centre	96	99
International Baccalaureate	12 institutions		1 institution	86	99
Organization (International)					
Parchment	15 institutions		4 institutions	81	99
Other ¹²⁴	5 institutions	1 institution	1 institution	92	99

Table 7: International Exchange Organizations and Activities with Canadian Post-secondary Institutions and Application Centres

¹²⁴ The following were referenced under 'Other': Salesforce (<u>https://www.salesforce.com/ca/</u>); test score results for ACT, SAT, LSAT, and MCAT; PDFs and other data from individual international institutions (e.g., Stanford).

¹²¹ https://www.ibo.org/

¹²² https://www.parchment.com/

¹²³ These data include post-secondary institutions and application centres/data hubs. Organizations could choose more than one category of response and identify more than one organization; therefore, the numbers will not add up to 31 unique organizations.

Section 5.0 - Gaps/Challenges

Another objective of the project included identifying the potential gaps and challenges which together necessitate creation of a national data exchange network. With the existence of the two application centres in Ontario, the post-secondary institutions appear to be supported with respect to most aspects of the admissions process given the supports in place for application data sharing and intra-provincial electronic transcript data exchange. However, the research indicates that important gaps and challenges exist many of which would be enhanced by trusted national and international exchange of official academic documents (Table 8). These include growing concerns regarding document and identify fraud; insufficient connectivity with recognized institutions and trusted credential repositories across Canada and internationally; and capacity gaps within institutions to automatically assess and assign transfer credit, even for those documents that arrive in an electronic format. In addition to these, institutional participants routinely noted the increasing pressures facing post-secondary institutions due to a lack of resources and government cuts. Some also suggested difficulties exist when trying to access internal support and priority status to introduce changes that support transfer and mobility.

These gaps impact on student's incoming and outgoing documents that require official validation. Potential risks include the potential erosion of the Canadian higher education brand (due to fraud) and student service (e.g., quality, timeliness). The situation introduces impediments to efficiency for both students and institutions and impacts on many areas including those related to transfer credit. Each is described further below.

Gap	Details	Documents Impacted
Increasing	No or limited system level exchange capacity exists to support official validation	Outgoing ones for other third
document fraud	of outgoing documents (other than Ontario post-secondary transcripts)	parties such as offers of
		admission and confirmations of
		enrolment, fees paid, pending
		graduation, and graduation
	No or limited capacity exists to support official validation of incoming	Incoming academic documents
	documents for studies completed outside of Ontario	(and other supporting documents
		such as language test results)
		required for admissions and
		transfer consideration
Lack of national	No or limited system level mechanisms exist to support exchange of official	Incoming academic documents
and	academic transcripts and supporting documents to aid efficient and quality	(and other supporting documents
international	assured admissions, transfer, and exchange processes:125	such as language test results)
connectivity for	 for Canadian educated students from other provinces 	required for admissions and
exchanging	 for internationally educated students 	transfer consideration
official		
documents	No system-level mechanism exists to electronically share and/or verify official	
	student status at students' current or former Canadian post-secondary	
	institutions.	

Table 8: Thematic Summary of Data Exchange Gaps

¹²⁵ In the context of this study, submission of *official* documents is intended to encompass documents that come directly to Canadian institutions from other post-secondary institutions or government mandated credential repositories.

Gap	Details	Documents Impacted
Challenges with intra-provincial document	No system-level connectivity exists between agreed upon course equivalencies and the application process to support the transfer assessment process.	Offers of admission – as these related to providing a student information about transfer credit
exchange	Limited automation exists within institutions to support transfer credit decision processes (e.g., automatic assigned of equivalencies or identification of pathways). Larger institutions sometimes have created capacity to enhance some aspects of the process through automation.	equivalencies

Increasing Document Fraud (Inbound and Outbound Document Validation)

In the interviews and regional meetings, institutions across Ontario and Canada regularly mentioned the importance of establishing trusted connections between post-secondary institutions and officially mandated data exchange hubs for academic document exchange to mitigate document fraud. The perception exists that document fraud is growing and resulting in lost enrolments and the erosion of trust.

As previously mentioned, it is difficult to identify the scope of fraud occurring as the cases are not tracked at the national level. Institutional representatives anecdotally shared proxy indicators such as '3 to 5 fraud cases per week,' '35 in total' last year, having to 'review 1400 student files and create customized letters to support expedited visa processes for international students', and 'having to deenrol students after the refund drop date due to discovering academic document fraud, which resulted in lost revenue to the institution of \$2.5 million' (due to not being able to recruit additional students to replace those de-enrolled after the start of classes). They reported increasing expectations from external third parties, such as the Canadian federal government, to provide official verification of students' statuses at their institutions given the concerns about fraud. This issue represents a top priority and undergirds the importance of a national data exchange network.

Limited Supports for Confirmation of Status or Graduation (Outbound Document Validation)

Related to document fraud are growing requests to officially validate out-bound Canadian academic documents. Currently, there are no, or limited, system wide capacities (provincially, nationally or, in many cases, institutionally) either in Ontario or at other Canadian post-secondary institutions to support this area. Examples cited in the regional meetings and interviews that would be better served by having this capacity impact documents that provide official verification of offers of admission, enrolment, fees paid, pending graduation, and graduation.¹²⁶ The core student data required for these examples include student demographic data, institutional and program identifiers, term/session dates, and registration status (offer made when, fees paid including amount, full- or part-time course enrolment, pending graduation, evidence of graduation).

As previously noted, 56% of the 23 Ontario institutions that participated in the survey reported having no capacity to provide electronic confirmation of a current student's enrolment. In contrast, confirmation of graduation reportedly exists for 52% of the 23 Ontario institutions and 18% of the 86 institutions from across Canada that participated in the survey. Only 16 institutions, of which 63% represented Ontario institutions, reported providing online confirmation of graduation either by

¹²⁶ Select institutions reported that they rely on third party vendors to support confirmations of final graduation for their alumni.

creating an in-house system or by partnering with an outside vendor to share graduate student data to facilitate credential verification.

The institutions cited the growing volume and manual effort required to officially validate status to fulfill requests from banks or related organizations (e.g., for Registered Education Savings Plans), health care or insurance providers, Immigration, Refugees and Citizenship Canada (IRCC) or the Canada Border Services Agency (CBSA), employers, regulatory and apprenticeship bodies, and other third parties. Institutions reported that these requests often require customized response and yearly follow up as a minimum.

It seems that third-party organizations including the government do not trust status confirmation documentation including offers of admission provided directly by students; hence, the growing volume of manual effort within institutions that is emerging. A national data exchange network would help to resolve this workload in that it would provide immediate and direct official verification capacity.

Limited National and International Connectivity (Inbound and Outbound Document Exchange)

Ontario post-secondary institutions and other Canadian institutions stressed that the lack of national and international connectivity to support student academic document exchange causes volume, workload pressures, and document fraud challenges. They emphasized the need for scalable and trusted document exchange capacity to support the portability of official academic documents between trusted entities. According to the research, this need remains for both in-bound international documents and out-bound Canadian documents (i.e., for those students who wish to study and work across Canada or in other countries). They suggested the lack of connectivity limits capacities to address document fraud. Furthermore, the research indicates the current situation is impeding efficiency and automation opportunities, increasing manual document fraud monitoring, and undermining student service (e.g., through increased service turnaround times given the extra time involved in assessing documents and determining their bone fides).

International Document Validation

International document assessment remains predominantly manual as institutions report hand review of each document is required by individual staff to ascertain the following:

- official document status (i.e. not fraudulent);
- official recognition of the institution/program;
- admissibility;
- prerequisite completion; and,
- transfer credit.

This validates the findings from a recent international study on assessment practices (Duklas, January 2019). According to the consultation for this research, the current manual approach is not sustainable given the growth of incoming international students.

Study Abroad

Additionally, a missed opportunity exists to support Canadian educated students that wish to study abroad. Due to the federated provincial/territorial system for education, those interviewed indicated that Canada's post-secondary system looks confusing to those in other countries who are assessing the

credentials of our graduates for study or work. The diversity of Canadian quality assurance and institutional recognition protocols, post-secondary institutions, and credentials cause interpretation challenges. As a result, it is not easy to assess a Canadian transcript, establish its bone fides, interpret the contents, and confirm the recognition of the institution from which a student graduated. Although helpful when available online or electronically, it is not enough to confirm that someone graduated. Given the focus on digitized documents exchanged electronically through a national network, the opportunity exists to identify methods to demystify and streamline the processes for those outside the country assessing the credentials of our graduating students.

Limited Inter-Provincial Exchange of Electronic Data (Inbound Document Exchange)

As previously mentioned, the survey data and research indicated that very few institutions and only a small number of application centres are exchanging electronic student information across provincial and territorial boundaries. In Ontario, OUAC is sending electronic transcript data to 11 post-secondary institutions in other provinces and exchanging data with EducationPlannerBC in British Columbia for two BC institutions.¹²⁷ OUAC is also receiving CEGEP data facilitated by the Bureau de coopération interuniversitaire in Québec. Other than this, no electronic post-secondary data is being exchanged between Ontario institutions and those in other provinces, which means that most of the admissions and transfer processing for out-of-province transfer students involves manual effort.

During the interviews and regional meetings, Ontario institutional representatives expressed a desire to access electronic high school transcripts from BC and Alberta. National findings suggest that student data is desired from institutions and application centre/data hubs in near vicinity to particular provinces and between provinces with larger populations (e.g., between Ontario, BC, Alberta, and Québec). This latter finding appears to align with the inter-provincial mobility patterns identified in other research (Burbidge & Finnie, 2000).

Potential to Enhance Intra-Provincial Student Data Exchange

Institutional representatives in the Ontario interviews and regional meetings indicated that more needs to be done both within institutions and across the province to continue to enhance the capacity of the overall transfer system. The national consultation validated this comment. For example, while larger institutions reported offering in-house equivalency systems which were populated locally, most did not have the capacity to automate work processes related to transfer students, pathways, and equivalency decisions.

The Ontario institutions and students noted that student data exchange connectivity did not exist between ONCAT and the two Ontario application centres. The students interviewed identified this as a potential gap and area for improvement. On a related note, ONCAT and OCAS recently explored a pilot project to connect the program information on the ONCAT website to the Ontario college application to provide a more direct search experience for students.¹²⁸ Such innovations would be helpful for students.

¹²⁷ This was the case at the time of the research.

¹²⁸ For this proof of concept, students searching on the ONCAT site were presented with an *Apply Now* button which took the visitor to the OCAS colleges' application login page so that they could easily access their college application information. As a result, the OCAS page was prepopulated with the name of the program, program identifier, and the receiving institution. No student data was passed to OCAS as ONCAT only captures their name, email address, and answers to security questions to support their portal.

When asked in the Ontario regional meetings if participants thought enhancing the tracking and automation of transfer information through the application process and beyond would be a viable goal, responses varied. Most indicated they thought it represented an *'interesting idea for front ending information and enhancing service'* for transfer students once implemented. A select group (typically representing larger institutions) indicated they already provide this support internally when transcript information is provided electronically, which corroborates findings from a previous research study (Duklas, January 2019). However, they indicated manual effort is required when results arrive in non-electronic formats. The participants in the Ontario meetings and interviews suggested that implementation would require the support of faculty members who approve the course equivalencies and that it would be difficult to implement automation at the program transfer level. Unlike the EMREX exemplar mentioned in the environmental scan, which is entirely student driven, some indicated that their faculty members would likely want to maintain the option to *sign off* on any equivalencies before the results were shared with students even when the courses had been previously approved for equivalency.

Prioritization Process for IT Projects, Constrained Resources, and Inflexible Systems

The findings indicate that prioritizing IT projects and organizational focus, a lack of resources and possibly expertise, and inflexible student information systems appear to be the main gaps/challenges to implementing/joining a national data exchange network and enhancing internal automation capacity. Ranking within the survey suggests the first two remain the biggest challenges (i.e., prioritization and focus; resource and expertise gaps). The section below provides thematic findings shared by the participants in interviews and regional meetings.

Organizational priority setting including for complex IT projects

According to the research, institutional respondents suggested resources were at times prioritized in favour of IT projects that address maintenance needs, government mandated projects, and enterprise projects focused on other IT needs within institutions (e.g., finance and human resources).¹²⁹ Participants acknowledged the importance of these projects and provided examples to illustrate the various competing priorities. Most indicated the project lists were extensive, making it difficult to add more.

In the national survey findings, most of the Ontario organizations (79%) and those in other provinces (59%) noted that existing organizational priorities would impede onboarding to a national data exchange network (Table 9). This may represent a larger concern for Ontario organizations.

Participants in interviews and regional meetings emphasized the importance of engaging government and senior institutional leadership in the national data exchange project. They stressed the importance of capturing their support for any desired advancements for transfer or mobility. However, only 11% of the Ontario organizations and 14% of respondents from other provinces thought that overall

¹²⁹ One institutional representative reported relying on a service agreement with another institution for their student information system which impeded their ability to influence any changes or to onboard to a national data exchange network. This represents a unique situation likely most relevant to young or smaller institutions as most of those in Ontario and across Canada have purchased a local licence for a student information system from a third-party vendor(s), use an in-house custom developed solution, or use a combination of both.

organizational support for a national data exchange network to support transfer would be an issue (Table 9).

Limited resources

Across all consultation venues, organizational representatives raised the issue of limited resources. Examples cited included a lack of funding, staff expertise, and time. Institutions in smaller urban locations stressed that finding and keeping expert staff represented a challenge, even when funding was provided. Both Ontario (54%) and national respondents (51%) reported that a lack of staff resources would impact on their ability to connect to a national data exchange network (Table 9). Respondents reported that a lack of financial resources represented an impediment (Ontario = 46%; other provinces = 58%) (Table 9). Participants in interviews and regional meetings stressed the need for additional resources to support onboarding, for both institutions and application centres/data hubs.

The researchers also explored perspectives on staff capacity, which relates to resourcing. In comparison to other provinces, Ontario survey respondents appear to have a proportionally higher confidence in the capacity of their in-house IT and project management expertise for establishing data exchange with third parties (Figures 13 and 14).¹³⁰ For example, 72% of the Ontario respondents indicated their organization had or probably had the project management and IT expertise versus 56% and 55% respectively of the respondents from other provinces and territories. When asked to rank the degree to which IT expertise would impact onboarding to a national exchange platform, 11% out of 28 Ontario respondents indicated this would have a great deal or considerable impact, 43% a moderate impact, and 39% no impact; the other provincial respondents indicated a proportionally higher impact (Table 10).

Inflexible IT systems

Participants reported that the institutional need to maintain older versions of student information systems sometimes impedes flexibility with connecting to other systems or prevents them from receiving or sending documents or data using more advanced exchange formats. The consultation suggested that institutions lack influence with student information system vendors to make customizations to address Canadian or provincially specific requirements.

When asked in the survey to rank the degree to which inflexible systems would impede onboarding to a national platform, 25% of 28 Ontario organizations indicated this was a high ranking concern (i.e., they ranked it *A great deal* or *Considerable*), which is in line with 23% of organizations from other provinces (Table 9). However, most Ontario organizations (61%) and 46% of those in other provinces indicated this was a *Moderate* or *Slight* impediment.

Other Gaps and Challenges Identified

An *Other* category in the survey supported by a free form field facilitated respondents providing additional suggestions regarding potential impediments to onboarding to a national solution. Three of the 28 Ontario respondents who responded shared implementation challenges rather than gaps. One institution noted privacy and data security considerations; another respondent spoke about the need to prioritize projects against other demands; and one of the application centres provided a series of helpful

¹³⁰ The figures include all responses to the survey that responded *yes* to being able to answer questions about their organization's data exchange capacities. Duplicate responses per organization are included in the opinion type questions; 'n' counts are noted as a result. Organizations include all those that participated in the survey. As the numbers of colleges are small within the provinces, the data are combined with university data for the balance of the opinion type findings.

suggestions which spoke to the technical details of implementation.¹³¹ This same respondent noted the need for service and data sharing agreements and other memorandums of understanding to manage the various partnerships involved in the data exchange process. One of the above respondents noted that the pace of change would be directly impacted by the capacity of the partners to participate, which speaks to the need for resourcing and focused prioritization to support onboarding to a national data exchange network.

The survey also included a question asking whether respondents thought policies at their organization would impede onboarding to a national data exchange network. Of the 28 Ontario respondents, 46% indicated that no policy barriers existed that would impede onboarding. Seven (25%) indicated *yes*; of these, five suggested privacy regulations represented an impediment, a concern shared by 14/18 respondents to this question from other provinces. Participants in the regional meetings and interviews also raised this issue routinely as did 18 survey respondents from other provinces.

One Ontario application centre respondent along with a counterpart from another province suggested their provincial mandate might limit their ability to prioritize a focus on onboarding to a national solution.

Potential Impediment	Region (Ontario 'n' = 28; Other Provinces 'n' = 71)	A Great Deal/Considerable	Moderately/Slightly	No	Don't Know
Commitment to current processes	Ontario	18%	57%	18%	7%
	Other Provinces/Territories	23%	51%	17%	10%
Focus on other organizational	Ontario	79%	14%	4%	4%
priorities	Other Provinces/Territories	59%	31%	3%	7%
Inability to change current processes	Ontario	14%	64%	14%	7%
	Other Provinces/Territories	15%	48%	31%	6%
Inflexible IT systems (SIS, LMS, etc.)	Ontario	25%	61%	7%	7%
	Other Provinces/Territories	23%	46%	20%	11%
Lack of buy-in for a national platform	Ontario	11%	57%	18%	14%
solution	Other Provinces/Territories	14%	34%	32%	20%
Lack of financial resources at my	Ontario	46%	43%	4%	7%
organization	Other Provinces/Territories	58%	34%	1%	7%

Table 9: Potential Impediments to Onboarding to a National Data Exchange Network

¹³¹ Examples cited: different institutional policies; different testing methodologies and requirements from potential trading partners; the need to support multiple standards and file formats (including cross-walking data standards, supporting multiple versions of the same standard (i.e., ensuring backward and forward compatibility), differences in interpreting data, mapping, etc. by various trading partners); workflow methodology differences of various trading partners (e.g., *not using requests or acknowledgements*, etc.); differences in operational support methodologies across various trading partners (e.g., *the handling of system-level reporting*, tracking, auditing, logging, and escalation processes for errors and exceptions).

Table 10: Rank the Degree to which a Lack of IT Expertise or In-house Staff Resources Impact Organizational Ability to Connect to a National Data Exchange Network

Impediment	Region	A Great Deal/Considerably	Moderately/Slightly	No	Don't know	Row Percentage
Lack of in-	Ontario (n=28)	11%	43%	39%	7%	100%
house IT expertise	Other Provinces/ Territories (n=71)	24%	38%	30%	8%	100%
Lack of in-	Ontario (n=28)	54%	29%	7%	11%	100%
house staff resources	Other Provinces/ Territories (n=71)	51%	34%	8%	7%	100%

Figure 13: Does Project Management Expertise Exist within your Organization to Establish Data Exchange?



Figure 14: Does IT Expertise Exist within your Organization to Establish Data Exchange



More National Tools to Support Assessment and Transfer

Some Ontario institutional representatives who participated in the regional meetings and several from across Canada noted that a national transfer equivalency and pathway database does not exist. When probed further in the regional meetings and interviews, participants routinely indicated that this type of

service would appear to enhance transfer and mobility. Unlike BC participants in interviews within that region, it wasn't entirely clear to the Ontario participants how this tool would enhance efficiencies within institutions.

Some suggested a tool be created to facilitate comparing grading scales to enable more accurate and faster assessments of student documents. These people suggested the lack of either of these types of supports constrained assessment efforts at the institutional level for both in-bound international and domestic transfer from other provinces. The former corroborates findings from other research (Duklas, January 2019). These types of tools sit outside of the scope of the national student data exchange network; however, they illustrate other gaps that, if closed, would enhance institutional efficiency and consistent quality assured assessment of student documents when transferring between post-secondary institutions.

Section 6.0 - Findings: Recommendations for a National Data Exchange Solution

Overview

A final objective of the research included seeking recommendations from the higher education community about the anticipated benefits and needs for a national data exchange network to support transfer and mobility. The survey, interviews, and regional meetings provided multiple opportunities to share insights.

Benefit Recommendations

The survey requested respondents rank the importance of a pre-set list of benefits that must result from the national exchange network (Table 11). The question allowed respondents to identify the level of importance for each benefit using a Likert scale.¹³² A freeform field encouraged qualitative comments.¹³³ These benefits serve as important indicators to guide priorities for the national network.

Top priority benefits for Ontario respondents (i.e., ranked as *very important* and/or *important*) that proportionally aligned with other jurisdictions across Canada include the following:

- improving service for students (73% for Ontario; 72% for other provinces);
- enhancing efficiencies for students (67% for Ontario; 64% for other provinces);
- enhancing institutional efficiencies;
 - Ontario respondents weighted this equally between very important and important (47%); whereas proportionally more respondents from other provinces ranked this as very important (66%).
- enhancing improved service for institutions; and,
- enhancing student transitions between post-secondary institutions in Canada or for international students.

Enhancing study abroad and transition into the workplace appeared as lower priorities as evidenced by the percentages in the *moderately/slightly important* category.

 ¹³² Scale: very important, important, moderately important, slightly important, neutral/no opinion, and not important - Due to small 'n' counts, the table combines results for moderately important and slightly important and organizational type. The survey allowed only one ranking choice per benefit. The table excludes null responses and includes more than one response per organization. Thirty Ontario respondents and 76 respondents from other provinces represent the pools for this table.
 ¹³³ One Ontario organization stressed the importance of accuracy over efficiency and importance; four organizations from outside Ontario provided insights. Of these, one rated efficiency savings in resources (e.g., staff time) as important; one rated improving data exchange supports for national licensing and regulatory bodies as very important; one rated reducing fraud as neutral/no opinion; and one indicated increased transparency for students was important.

Table 11: Ra	nking of Ben	fits that mus	t result from	the National	Network
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Enhancements (listed in descending order based on Ontario's 'Very Important' rank)	Region (ON=30; Other Provinces=76)	Very Important	Important	Moderately/ Slightly Important	Not Important	Neutral/No Opinion	Row Totals, %
Improved Service for Students	Ontario	73%	23%	0%	0%	3%	30 <i>,</i> 100%
	Other Provinces	72%	22%	3%	0%	3%	76, 100%
Efficiencies for Students	Ontario	67%	27%	3%	0%	3%	30 <i>,</i> 100%
	Other Provinces	64%	30%	3%	0%	3%	76%, 100
Efficiencies for Institutions	Ontario	47%	47%	3%	0%	3%	30 <i>,</i> 100%
	Other Provinces	66%	24%	8%	0%	3%	76%, 100
Improved Service for Institutions	Ontario	43%	50%	3%	0%	3%	30 <i>,</i> 100%
	Other Provinces	62%	25%	11%	0%	3%	76%, 100
Improved Student Services to Support Transition between	Ontario	37%	47%	7%	7%	3%	30 <i>,</i> 100%
Canadian Institutions	Other Provinces	50%	33%	12%	0%	5%	76%, 100
Improved Service for International Students	Ontario	23%	57%	10%	3%	7%	30 <i>,</i> 100%
wishing to Study within Canadian PSIs	Other Provinces	46%	32%	18%	1%	3%	76%, 100
Improved Student Services to support PSI Exchange or	Ontario	17%	37%	37%	0%	10%	30 <i>,</i> 100%
Study Abroad	Other Provinces	24%	45%	25%	1%	5%	76%, 100
Enhanced Transition of PSI Students into Workplace	Ontario	17%	30%	33%	7%	13%	30, 100%
	Other Provinces	22%	25%	43%	4%	5%	76%, 100

Funding, Operational Structure, and Governance Recommendations

Table 12 captures the thematic funding, operational, and governance considerations raised by the Ontario higher education community, all of which require further research and consultation (see Appendix G for more detailed findings).

Focus Area	Suggested Consultation Questions	Next Steps
Operational structure and governance	Which entity should own the network? An arm of government? ARUCC? Some other separately incorporated entity? What operational structure makes sense?	Further consultation needed
Trusted membership	What are the criteria for <i>trusted</i> institutions?	Further consultation needed A respondent advised allowing full participation of recognized private institutions with an associated fees structure.
Sustainability	How should the network be structured to ensure it can operate if funding goals remain unattainable?	Revenue models of network require further consideration One respondent suggested ensuring a flexible structure that could function without regular funding from an outside source.
Government support	What role makes sense for provincial and federal governments?	Engage government support; however, maintain a member-led network – This was considered important given the diversity of the provinces/territories and institutions.
Implementation support	What supports should be provided to smaller institutions?	Provide onboarding support for institutions, particularly small ones that lack resources and expertise

Table 12: Suggested Next Stage Consultation Questions

Connectivity Recommendations with Trusted Organizations

Survey respondents identified connecting with trusted entities as a priority to enhance transfer and mobility (Table 13). Establishing connectivity to Canadian data hubs ranked higher than with international trusted entities although a desire still exists to connect to the latter (Table 14).

The survey probed more deeply to understanding the connectivity desired (Table 15). Again, connectivity with existing Canadian hubs, post-secondary institutions, and secondary schools/boards ranked higher, a finding which aligned with other provinces. For Ontario, establishing a prioritized implementation plan that includes and considers onboarding opportunities and needs for the application centres/data hubs (OUAC, OCAS, and others) will be important to future successful implementation (i.e., if application or admissions related exchange or transcript exchange are given priority, it would be extremely helpful to ensure their involvement).

Other suggested organizations to connect with for the purposes of student data exchange that were identified by the Ontario respondents include language proficiency test providers, institutional research bodies (e.g., CIRPA),¹³⁴ the Québec Bureau de coopération (BCI), and regulatory bodies and associations (e.g., law society, provincial nursing association, etc.). Respondents from other provinces suggested

¹³⁴ http://cirpa-acpri.ca/

these same examples and further identified accrediting bodies, government agencies, the US College Board, the International Baccalaureate Organization, and the National Student Clearinghouse.

In the Ontario interviews and regional meetings, institutional colleagues stressed the need to connect with the federal government to support validation checks for offers of admission and enrolment; participants routinely noted challenges and manual effort related to this area. The survey data did not identify this as a top priority concern for Ontario at 48% (Table 15) in comparison to 77% of the respondents from the other provinces. Resolving these discrepancies represents an important area of focus for next stage research and the national network.

Enhancements (listed in descending order based on Ontario's 'Very Important' rank)	Region (ON=30; Other Provinces=76)	Very Important	Important	Moderately/ Slightly Important	Not Important	Neutral/No Opinion
With Other Canadian Data Exchange Hubs	Ontario	53%	43%	0%	0%	3%
	Other Provinces	41%	32%	13%	1%	13%
Between Canadian Institutions	Ontario	23%	40%	30%	3%	3%
	Other Provinces	36%	20%	21%	7%	17%
With Other International Hubs	Ontario	10%	43%	33%	3%	10%
	Other Provinces	13%	38%	34%	3%	12%

Table 13: Overall Ranking of Priorities for Exchange Enhancements

Table 14: Desires for International Connectivity

	Send to	International Organizations	Receive from International Organizations		
Region	Ontario	Other Provinces	Ontario	Other Provinces	
Desired	63%	74%	74%	85%	
Not Desirable	11%	11%	4%	4%	
Not Applicable	4%	10%	4%	7%	
I don't know	22%	5%	19%	4%	
Column Totals	27, 100%	73, 100%	27, 100%	73, 100%	

Table 15: Ontario Respondents Priority for Connectivity as Compared to Other Provinces

Priority for Connectivity(listed in descending order)	Region (On=27, Other provinces=73)	Desired	Exists already	Not Desired	Not Applicable	Don't Know
With application centre in another	Ontario	89%	4%	0%	4%	4%
province	Other Provinces	77%	7%	7%	1%	8%
With post-secondary institutions in	Ontario	89%	4%	0%	4%	4%
other Canadian jurisdictions	Other Provinces	93%	4%	1%	0%	1%
With secondary schools and boards	Ontario	70%	11%	4%	4%	11%
in other provinces	Other Provinces	84%	1%	7%	7%	1%
With councils of articulation and	Ontario	67%	15%	4%	7%	7%
transfer	Other Provinces	68%	7%	1%	5%	18%
With external credential evaluators	Ontario	67%	11%	4%	4%	15%
	Other Provinces	70%	1%	8%	7%	14%

						-
Priority for Connectivity(listed in	Region (On=27, Other	Desired	Exists	Not	Not	Don't
descending order)	provinces=73)		already	Desired	Applicable	Know
With professional regulatory	Ontario	63%	11%	7%	0%	19%
bodies	Other Provinces	71%	3%	3%	10%	14%
With other education organizations	Ontario	52%	0%	0%	33%	15%
(e.g., other private institutions, language testing providers, credential evaluators)	Other Provinces	82%	11%	1%	0%	5%
With provincial government	Ontario	52%	33%	0%	0%	15%
	Other Provinces	56%	38%	0%	1%	4%
With Canadian federal government	Ontario	48%	11%	0%	4%	37%
	Other Provinces	77%	8%	3%	5%	7%
With apprenticeship and trades	Ontario	37%	7%	22%	15%	19%
organizations	Other Provinces	36%	11%	5%	32%	16%

Other Implementation Recommendations

Overall

Throughout the survey, respondents provided insights in various freeform sections related to overall implementation matters. These are thematically represented below with details following in subsequent sections (Table 16). Appendix G provides detailed examples of specific recommendations.

Table 16: Implementation Suggestions from Qualitative Questions in Survey

Focus Area	Suggestions
Made for Canada	• Made for Canada does not necessarily mean Made in Canada; consider leveraging vendors
versus Made in	from other markets with alternative and extensive experience in this area.
Canada	• Avoid building the system from scratch; buy an existing system or extend a proven option.
Priorities	Address high volume data exchange needs.
	Prioritize exchange within Canada before exchanging internationally.
Implementation	Stagger implementation
	 Introduce functionality incrementally - Avoid trying to be everything to everyone all at once.
	Be flexible and support onboarding for institutions and application centres/data hubs.
Identity	Establish a way to connect student records from different institutions for the same
management	student.
Working with	 Work with existing Canadian hubs to the extent possible (assuming interest).
existing hubs	Connect through existing provincial hubs to avoid multiple exchange points. For Ontario,
	participants noted the complexities introduced by having two different application
	centres. As this exists across the country, this is a reality for the national network to
	address.
Diversity	Consider how to accommodate the different regions, some of which lack data hubs.
	Establish connectivity between near provinces.
	Include private post-secondary institutions.
Interoperability	 Plan for alternative functionality (band width, data storage versus data transfer) and ensure interoperability with other provincial and national/international networks.
	 Accommodate different forms of exchange (e.g., PDF is viable, don't discount it; it is easier to implement, as well).
	• Ensure the network supports interoperability and flexible data exchange.
	• Ensure data is provided in <i>raw</i> form (with no details provided), with multiple
	communication formats (HTTP, SFTP, Web Service, API, etc.), and uses existing PESC XML
	standards.
	Standardize the exchange protocols and avoid being too flexible.

Focus Area	Suggestions
Future proofing	Ensure the network is poised to adopt new technologies and approaches.
Privacy and policy	 Avoid data policies or agreements that might impede transition to the national network. Given the different and stringent privacy requirements in Canada, consider options that avoid opening the data file being transmitted. They suggested doing so might impact on local privacy impact assessments.
Research opportunity	• Consider future research opportunities that a national data exchange network could bring to better understanding Canada's post-secondary transfer and mobility patterns (the <i>Clearinghouse</i> in the US was noted as an exemplar).

Recommendations for Online Services

Throughout the research process, the primary investigator asked organizations including those in Ontario, for advice regarding the types of online services that should be provided by the national network to enhance transfer and mobility. The options discussed included a website for the trusted organizations sharing data through the network, and an environment for students (e.g., a public facing website, online services, a portal, blockchain access through their phone).

Services for Organizations

Most organizational respondents in Ontario (79% out of 18) and from other provinces (86% out of 73) indicated the national network should provide a password protected website for organizations using the network.¹³⁵ As a support to the Canadian higher education brand, 71% of 28 Ontario respondents and 86% of 73 respondents from other provinces supported the national network providing a Canadian version of the apostille appended to the electronic student records to demonstrate their authenticity and official nature.¹³⁶ Organizational respondents in Ontario and other provinces clearly want the national network to provide bilingual content (86% of 28 Ontario respondents; 94% of 73 respondents from other provinces). This theme emerged routinely in the interviews and regional meetings.

Services for Students

Student Portal

Most respondents across Ontario and Canada responded with uncertainty about whether the national network should provide a student portal (Figure 15), a finding that aligns with feedback from the interviews and regional meetings. Generally, the community feels the technology solution proposed may drive the necessity for a portal. Thirty-six percent of the Ontario respondents and 41% of the respondents from other provinces indicated a student portal was necessary. Nine Ontario respondents provided further rationale for responding *yes*. Six of these emphasized privacy/consent of use as the primary reason and three suggested it would enhance the search experience for students. Two who suggested the latter recommended this enhancement occur after initial implementation of the network. Thirty-one percent (9/29 respondents) from other provinces suggested privacy and consent of use served as the primary rationale for providing this support which aligns with the Ontario respondents; 45% (13) suggested it would improve student service; 7% (two) suggested it would enhance institutional

¹³⁵ Seven percent and 5% respectively indicated that this was not needed; and the balance remaining indicated they didn't know or it wasn't applicable (with no further details provided).

¹³⁶ Apostille: a 'legal certification that makes a document from one country valid in another (provided that both are signatories to the 1961 Hague Convention Abolishing the Requirement for Legalization for Foreign Public Documents.' (Oxford Dictionnaries, 2019) Note: as Canada is not currently a signatory to the Hague, the government provides the authentication criteria for Canadian documents, including academic documents (Government of Canada, 2017).
efficiency (e.g., by creating one environment for this service); 7% (two) suggested it depends on the final model chosen for the network; and 7% (two) responses were unclear.



Figure 15: Should the national network provide a password protected student portal?

Student Public Website

Consultation in regional meetings suggested two important considerations: (i) you need permission from students to move their data which requires a way to message and manage that process; and (ii) whether a student facing environment is needed depends on the national network model chosen. However, whatever technical solution is chosen for the network, permission management remains an important area for consideration.

- Proportionally more Ontario respondents indicated the network should provide a public facing student website (46% versus 43% of respondents from other provinces), although a significant majority in both instances indicated they did not know if it would be necessary initially (36% and 45% respectively) (Figure 16).
- The 12 Ontario respondents who responded *yes* provided additional rationales. Ten stressed that a centrally provided website enhances transparency (as a support to privacy/consent of use regulations) and ease of use particularly as the students need to know where their data is being sent. Two noted the curation opportunity provided by a central website to reduce confusion. One of these noted the importance of sending students to the central provincial application hub (if applicable) from the national network.
- Nationally, 30 of 32 respondents provided additional detail that validated the Ontario perspective and stressed the importance of transparency (for information purposes and privacy/consent of use). One of these noted the value of a public website for enhancing institutional efficiency. In contrast, another respondent noted that it is difficult for institutions to update multiple platforms. Another indicated that a phased implementation approach may be advisable (i.e., introducing a student website at a later point).





Online Services for Students

Most Ontario and national respondents expressed uncertainty (43%) regarding whether online services through the national network were necessary.

- Thirty-nine percent of 28 Ontario respondents and 38% of 74 from other provinces indicated *yes*, services should be provided (18% and 19% respectively responded *no*).
- In the qualitative section for this question, 10 Ontario respondents suggested providing capacity for students to make and monitor the status of any document or data requests they made. One of these expressed that students should be able to access and monitor any transfer equivalencies received.
- These comments matched the thematic insights provided by 27 respondents from other provinces. Of these, 18 indicated students should be able to send, receive, and/or view their results; two suggested providing access to transfer credit equivalencies; one suggested the site provide central application support; and another suggested it provide career planning functionality (the balance of the remaining responses emphasized that providing online services centrally aligns with student expectations or ensures clarity). One of these respondents also suggested expansion of online services be considered after establishing the network.

Section 7.0 - Conclusion

The research for this project focused on understanding student data exchange practices and perspectives between Ontario post-secondary institutions and their partners. It also explored the potential opportunities for improving transfer and mobility by enhancing digitization and exchange of student's academic credentials, transcripts, and other documents. The research group led by Joanne Duklas through the Association of Registrars of the Universities and Colleges of Canada (ARUCC) aspires to provide useful research for ONCAT and the post-secondary community to inform policy development and resource prioritization for transfer and mobility. These aspirations directly align with ONCAT's stated intention of understanding and removing systemic barriers that impede seamless transfer.

The impetus for this ONCAT funded research stems from broader efforts to create a national student data exchange network. The goal of that larger national project, referred to in this report as the *ARUCC Groningen Project*, is to enable students to move seamlessly between Canadian post-secondary institutions and into the workforce by improving official credential and academic document exchange.

Research Questions and Approach

The primary and secondary research questions for the study included the following:

- 1. What broader context, current practices, and associated gaps face Ontario post-secondary institutions with respect to student data exchange?
- 2. What recommendations do Ontario post-secondary registrarial leadership and supporting organizations have for advancing institutional capacities and change readiness for data exchange to advance transfer?
- 3. Sub-research questions:
 - a) Are there any notable exemplars to help guide change?
 - b) What benefits will result from a national network that advance seamless inter- and intraprovincial transfer for Ontario post-secondary institutions and their students?

The separate sections in the report address each of these areas. Section 3.0 outlines the broader context and exemplars evident across Canada and beyond. Sections 4.0 and 5.0 provide the detailed findings regarding current practices and gaps. Section 6.0 outlines the recommendations and perceived benefits as identified by the higher education community.

A multi-layered approach guided the research. An environmental scan of relevant literature and websites helped to clarify the broader context and promising practices both within Canada and beyond. The next stage of primary research involved three components: a national bilingual (French, English) survey, qualitative interviews, and inter-institutional regional meetings.

The target audience for the research included registrarial and data exchange leaders at colleges, institutes, and universities. It also included leaders from supporting organizations across Canada including application centres such as the Ontario Universities' Application Centre (OUAC) and OCAS (the Ontario college application service centre) and the seven councils on articulation/admissions and transfer (e.g., the Ontario Council on Articulation and Transfer - ONCAT).

The national, bilingual survey collected 117 responses and benefitted from an 85% completion rate. Eighty-six public and private post-secondary institutions participated in the survey. Of these, 76 publicly funded institutions participated, which represents 37% (76/204) of the total pool of Canadian public post-secondary institutions. For Ontario, respondents from 53% (24/45) of the publicly funded postsecondary institutions participated in the survey in addition to the two application centres, and ONCAT. The institutions included 42% from colleges/institutes (10/24) and 67% from universities (14/21). The survey contained both qualitative and quantitative opportunities for input. For the recommendations, the primary investigator used a Likert scale in the survey to facilitate capturing a maximum number of responses.

To support this study, the researcher consulted with more than 270 people both in Ontario and across Canada in the interviews and regional meetings. This included interviews with 40 representatives of higher education organizations and nine students. The former included 31 institutions (i.e., ten colleges and nine universities from British Columbia, Alberta, and Ontario; Appendix B) and ten supporting organizations from across Canada (Appendix C). Fourteen of these interviews included staff who represented ONCAT, OCAS, OUAC, and six colleges and six universities from Ontario. Of the nine students, three represented the Canadian Federation of Students (CFS), the Ontario College Student Alliance, and the Ontario Undergraduate Student Alliance (OUSA).

In addition to the interviews, the researcher held 11 regional meetings involving 231 people, of which ten were delivered in Ontario. Some of these were delivered virtually; however, most occurred in person. The Ontario meetings were held in the following regions: Toronto, Durham (virtually), Ottawa, Guelph, Sudbury, and Kitchener-Waterloo.

The project received guidance and input from representatives of the Ontario College Committee of Registrars, Admissions and Liaison Officers (CRALO), the Ontario University Registrars' Association (OURA), and from an external evaluator. The primary investigator also received support from the leadership of the *ARUCC Groningen Project*. The partnerships with key members of the Ontario higher education community represented a core strength of the project considering its complexity. It also ensured meaningful research and support for the consultation process.

Data Limitations

A lack of data regarding the scope of provincial and national mobility and data exchange hampered the research process; therefore, proxy indicators informed an understanding of the pressures impacting Ontario post-secondary institutions. Developing capacity to capture data covering the full scope of transfer and mobility would be an area of future enhancement. For example, transfer in Ontario includes intra-provincial, national, and international learners; therefore, identifying the volumes and trends across <u>all</u> these cohorts would better serve post-secondary institutions. While conducting this type of research sat outside the scope of this project, the Maritime Provinces Higher Education Commission (MPHEC) mobility research,¹³⁷ British Columbia's Student Transition Project,¹³⁸ and Burbidge and Finnie's (Burbidge & Finnie, 2000) earlier research regarding Canadian post-secondary student mobility serve as exemplar models. The US-based National Student Clearinghouse (NSCL) represents another exemplar. It is a non-profit organization that provides post-secondary institutions reporting, data exchange (e.g., transcripts), and official verification of documents. Through its Research Centre,¹³⁹ institutions access extensive regional and national level transfer and mobility data and

¹³⁷ http://www.mphec.ca/research/trendsmaritimehighereducation.aspx

¹³⁸ <u>https://www2.gov.bc.ca/gov/content/education-training/post-secondary-education/data-research/student-transitions-project</u>

¹³⁹ <u>https://nscresearchcenter.org/</u>

research. Other exemplars include the recent transcript exchange volume study conducted by ONCAT and OCAS with OUAC's support (Weins & Fritz, M., 2018) and OUSA's study of 1,300 transfer students (2017). The former provides a beginning understanding of student intentions related to intra-provincial transfer using transcript exchange as a proxy indicator and the latter represents a multi-institutional example of student-led research of transfer students across six universities.

Broader Context – The Findings

A Need for International and National Connectivity

Ontario post-secondary institutions support mobile learners who are moving across Canada, studying abroad, or arriving from international destinations many of whom seek transfer credit. Currently, most of these institutions lack connectivity to trusted post-secondary institutions and credential repositories beyond the province to support student data exchange. According to the findings, students applying from outside of Ontario typically submit documents in non-electronic formats (by mail or in-person) that staff subsequently evaluate and assess manually for both admissions and transfer credit. As the volume is high and growing, the current approach is not sustainable. Potential risks include reduced student service (e.g., quality, timeliness) and impediments to efficiency for both students and institutions. Unfortunately, document and identity fraud represent additional concerns. Both transfer and learner mobility are disadvantaged by this situation.

The report references exemplar international organizations and other application centres and data hubs across Canada that offer access to trusted electronic academic results (Section 3.0). These represent potential partners for Ontario post-secondary institutions and application centres to enhance connectivity and subsequent support for students. An example is provided by CHESICC which is a government mandated organization that is one of two official sources for many of the academic results for Chinese students. McGill University established Canada's first connection to CHESICC via the National Student Clearinghouse, an American not-for-profit organization that provides national data exchange and research supports to post-secondary institutions south of the border and around the world. In this example, transfer and high school graduates from China provide permission for CHESICC to send their official academic results to McGill directly. Service enhancements, speed, enhanced processing efficiencies, reduced workload, and reduced fraud represent five direct benefits for students and McGill. Other similar models exist around the world including in Australia and New Zealand through a platform called My eQuals. Previously completed ARUCC research provides additional examples of providers from beyond Canada that serve as potential connectors for official credential and academic document exchange.

Ontario Transfer Reality

The emphasis in the province on student transfer and the work of organizations such as ONCAT, OUAC, and OCAS positions it well for enhancing student data exchange. Electronic transcript exchange to support admissions exists within Ontario – both for transmitting electronic academic results directly from high school to post-secondary and between institutions. As noted above, improvements are needed for out-of-province and internationally educated students and those transferring out of an Ontario post-secondary institution for work or school in another jurisdiction. Having noted this, gaps exist even for those who remain fully within the province. For example, many institutions reportedly lack the resources to automate internal practices for transfer students, particularly for transfer credit assessment. As a result, not all institutions identify the transfer equivalencies awarded at the point of

making an offer, which is considered a best practice as it is a time of key decision making for students. Ideally, being able to validate equivalencies in advance of applying is an even better option which emphasizes the important work of ONCAT. However, official notice of equivalency awards often happens later in the process.

While a national data exchange network will not solve all these challenges, providing trusted connections to facilitate seamless and direct electronic academic document exchange from across Canada and internationally will free up staff currently focused on authenticating documents. These and other staff experts would be important partners to help institutions to refocus and create additional improvements to internal policies and practices in support of transfer and mobility.

Electronic transcript exchange developed to specifically support enhancing information access and transfer in the province represents an important area of focus that ties into the work of ONCAT, the post-secondary institutions, the application centres, and others. While how to improve internal automation capacity within post-secondary institutions represents an area of further study outside the scope of this research, achieving improvements here aligns with the goals of the *ARUCC Groningen Project* where trusted connections, student data exchange, and technology enabled supports improve access and transparency. Accessing official documents directly from source institutions in an electronic format represents the first important step; supporting further automation and scalable practices within institutions to reduce burdens on students represents an important next step.

Growing Document and Identity Fraud

Section 3.0 briefly explores the growing occurrences of document and identity fraud. Post-secondary institutional representatives raised this concern in most of the interviews and regional meetings conducted for this project. The need to establish direct electronic connectivity with trusted organizations and institutions across Canada and internationally remains essential to address this challenge. Providing trusted exchange of incoming and outgoing academic documents supports quality assured practices and helps to maintain the Canadian higher education brand.

Growing Volume

Increasing applications, enrolments, and graduations are driving requests for a host of services across the entire student life cycle. Students require more immediate and scalable supports, including when moving into, between, and beyond institutions. The report provides specific examples of these volume drivers in Section 3.0. Documents impacted include incoming ones required from students to conduct admissions and transfer assessments and outgoing ones being sent to support students with their next steps and resource needs. The latter include offers of admission and confirmations of enrolment, fees paid, pending graduation, and graduation. Post-secondary representatives thoughtfully identified the challenges and potential solutions for addressing these areas through enhanced electronic exchange. Sections 5.0 and 6.0 provide these findings.

International students illustrate the growing demand of relevance to transfer, Ontario's post-secondary needs, and the national data exchange network. While data do not exist to support concise identification of those that are transfer students, the overall number seeking to study in Canadian post-secondary institutions grew rapidly in the last three years. For example, Canadian post-secondary institutions have seen a 47% increase from 2015 to 2018 in study permits being granted by the federal government to international students. They require this document before arriving in Canada. Ontario bound international students represent 64% of the volume in 2018. Other data indicates most students

are coming from countries such as China, India, South Korea, France, and the United States. At least four of these regions maintain trusted institutionally supported and/or government mandated official credential repositories. If Canadian post-secondary institutions connected electronically to these entities through a national network, the improvements to international admissions and transfer processing would be enormous as would the reduction in the potential for document fraud. At minimum, no longer would staff have to verify the official nature of a document that came to the institution directly from a trusted organization by electronic means.

Outgoing documents presents another example. Each international student admitted requires an official offer of admission to be presented to the Canadian government in order to access their permit. Several post-secondary representatives noted the increasing volume of verification requests from Immigration, Refugees and Citizenship Canada (IRCC) to validate offers of admission or registration for international students on study permit. While these exercises remain important to efficiently help students and the government, the volume is growing. It would seem this is being driven by concerns about fraud at minimum.

Another proxy indicator impacting official validation of outgoing documents is the growing volume of requests from students who are required to provide official verification of their current or former status to other third parties. Examples of third parties making these requests include funding bodies, regulatory bodies, trades associations, government, and employers. For example, graduation rates increased by 11% in the past five years which means there have been significant increases in the volume of requests to post-secondary institutions to officially validate students' credentials. Similar challenges exist with official confirmations of enrolment. For example, students require these to access funds from Registered Education Savings Plans (RESPs), an area that has seen a 37% growth since the program's inception.

Establishing direct electronic connections with trusted international institutions and organizations and other institutions and organizations across Canada, including the government, remains essential to support these increases.

Canadian Exemplars

Ontario post-secondary institutions engage in extensive data exchange with the two provincial application centres, OUAC (for universities) and OCAS (for colleges). The data and document exchange that occurs serves centralized application processing and transcript exchange as a support for admissions. However, not all applications and transcripts go through the centres. That which does focuses primarily on Ontario secondary and post-secondary results, however, even that does not represent all the volume as a portion go direct to institutions.

The expertise of application centre staff represents a significant asset to any future national data exchange network. Both centres within Ontario are exemplars for the intra-provincial application and transcript exchange support they provide member institutions. Centres in other jurisdictions across Canada offer similar exemplar models. Some examples are noted below.

- OUAC and EducationPlannerBC are Canadian exemplars for establishing electronic connectivity across Canada.¹⁴⁰
- OUAC is a Canadian exemplar for establishing international connectivity with trusted organizations.¹⁴¹
- OCAS handles the transcript distribution ordering system for OUAC. It recently launched the *International Applicant Service* which supports colleges and their recruitment agents who aid
 international students during the admissions process. As this research and the national *ARUCC Groningen Project* are focused on establishing connectivity with trusted institutions and
 organizations providing *officially* verified documents (e.g., documents received from and verified
 directly by government mandated credential repositories or from other post-secondary institutions),
 recruitment agents are not considered primary sources for official transcripts in the context of this
 project. However, OCAS efforts still demonstrate the innovative methods the application centres are
 pursuing to enhance service to students and post-secondary institutions.
- Finally, the Ontario application centres have the capacity to transform student data without altering original content to support flexible, large-scale data exchange. This is a critically important strength when considering national and international data exchange of student data.

Next Step Recommendations from the Higher Education Community

ARUCC members, including Ontario post-secondary institutions, formally voted at the June biennial national conference to move ahead with a national student data exchange network to support both domestic and international students.¹⁴² None during the consultation disagreed with this position. Therefore, the recommendations from the Ontario higher education community which are explained in detail in Section 6.0 and summarized below in Table 17, provide specific suggestions on how to implement the national data exchange network.

Ensure the national network	Additional findings and activities
Addresses top priority needs.	Key priorities identified by Ontario and national higher education organizations:
	improve service and enhance efficiencies for students and institutions and mitigate
	document fraud by establishing secure, trusted academic document exchange.
Captures provostial support and	The ARUCC Groningen Project secured formal written endorsements from
appreciation for the direct relationship	University Canada and Colleges and Institutes Canada for the national data
between student mobility and student	exchange project. ¹⁴³ Several colleges and universities and supporting organizations
data portability.	provided similar written endorsements including the Ontario Council of
	Articulations and Transfer (ONCAT), the Ontario College Committee of Registrars,
	Admissions and Liaison Officers (CRALO), the Ontario University Registrars'
	Association (OURA), and the Ontario Council of Academic Vice Presidents of the
	Council of Ontario Universities.

Table 17: Thematic Recommendations from Ontario post-secondary institutions

¹⁴² http://arucc.ca/en/projects/task-force-groningen.html

¹⁴⁰ OUAC and EducationPlannerBC maintain exchange for two post-secondary institutions in BC. OUAC receives CEGEP transcript results from Québec.

¹⁴¹ OUAC receives test results (e.g., LSAT, GMAT, etc.) from the United States to support professional and graduate admissions and maintains a partnership with the World Education Services (WES), an international document credential evaluation firm. WES staff review documents and establish equivalencies between international documents and Canadian credentials for students who have studied in other countries. OUAC receives PDF evaluations from WES which are distributed to Ontario universities to maximize supports and minimize costs for students.

¹⁴³ <u>http://arucc.ca/en/projects/task-force-groningen.html</u>

Ensure the national network	Additional findings and activities
Accesses alternate funding sources to help registrarial leadership develop the capacities to exchange student data and subsequently support student transfer and mobility imperatives.	The ARUCC Groningen Project is actively fundraising and has received initial funding from post-secondary institutions across Canada and within Ontario. Other funders to date include the Ontario Council on Articulation and Transfer (ONCAT), the British Columbia Council on Admissions and Transfer (BCCAT), Campus Manitoba, the Pan-Canadian Consortium on Admissions and Transfer, and the Association of Registrars of the Universities and Colleges of Canada (ARUCC).
structure and ongoing governance given the federated nature of education in Canada.	Groningen Project is developing a consultation document to capture further input on this area.
Supports Canada's diversity.	This speaks to a core principle of the ARUCC Groningen Project which is to support the autonomy and diversity of Canadian post-secondary institutions and provinces and territories. ¹⁴⁴
Develops a sustainable financial structure and provides the capacity to collect and reconcile back to institutions any fees for service they need to collect.	Most higher education members advised that the network consider adopting a cost recovery revenue model for the network.
Offers bilingual capacity (French and English).	This Ontario project conducted regional meetings where the primary investigator explored considerations and needs for French only and bilingual institutions. It is clear from the research that a national data exchange network must consider bilingualism and related needs and context.
Establishes a phased implementation plan.	 Sample components suggested included the following: Establish connectivity first between Canadian post-secondary and data hubs followed by international trusted entities. Start first with establishing exchange for transcripts from across Canada and internationally (post-secondary, secondary) and outgoing graduate confirmations and admission offers. Facilitate flexible approaches and interoperability. They suggested the project consider a PDF sharing capacity for those that lack the ability to exchange machine-readable data. However, they also advise ensuring the network supports flexible data exchange formats. Involve the application centres in subsequent implementation discussions after the Request for Proposal (RFP) phase for the national data exchange network (recognizing that some may wish to compete for the RFP). Engage system design architects to map out use cases and information flows and clearly align the use cases to the requirements requested by the community. Engage privacy experts to support the RFP process.
Supports the onboarding and resource needs of institutions and application centres.	The Ontario community and others noted support is needed for smaller institutions and those that rely on other institutions to support their student information system needs. A core principle of the <i>ARUCC Groningen Project</i> includes supporting and complementing the efforts of the existing application centres.
Provides an institutional online environment and, if applicable, a student accessible environment to facilitate viewing and sharing of official documents regardless of where students studied or wish to study within Canada.	If a student environment existed, the community stressed that capacity be provided for students to control who sees their documents when and to monitor any of their own ordering requests.

¹⁴⁴ http://arucc.ca/en/projects/task-force-groningen.html

Final Thoughts

The Ontario research validates the conclusion that a national student data exchange network represents a viable next step to support Canadian higher education and student transfer and mobility. The research findings suggest that tying accessible student data portability to learner mobility needs to be a strategic intention supported by the highest levels of leadership. The community advised that doing so requires a prioritized focus on developing the capacity to serve long-term learner mobility. While there are many competing priorities, Ontario post-secondary institutions are well positioned to both benefit from and contribute to a national student data exchange network. The research indicates that the various aspects of registrarial service delivery embed both the academic and student needs at the core of the activities; however, the institutions and students require greater speed, transparency, efficiency, and coherence. The national network holds the promise of addressing these needs and ensuring quality assured, official exchange through trusted connections. With growing volumes juxtaposed against resource constraints, new and more scalable methods that leverage technology and different approaches to service delivery are not easily achieved but hold the promise of addressing core challenges. The findings from this research indicate a national student data exchange network collaboratively built and coordinated holds the promise of meeting students in their space and supporting their long-term educational journey between institutions and into the workforce.

Appendix A: External Evaluator Summative Assessment Report

EXTERNAL EVALUATION REPORT

for the

ARUCC-ONCAT Project: Advancing Student Transfer through Enhanced Data Mobility

One of the deliverables of the ONCAT-funded project: *Advancing Student Transfer through Enhanced Data Mobility* was the preparation of an evaluation report by an external evaluator. The report by Joanna Pesaro, external evaluator, follows.

A. Synopsis of Evaluator Methodology and Activities (May, 2018 – March, 2019)

The following activities formed part of the original agreement and were completed by the evaluator:

FORMATIVE & SUMMATIVE

- 1. Reviewed existing project pre-launch documentation to ascertain project scope, goals, research questions, research methodology
- 2. Provided input to ensure clarity of project scope and intended research goals to support communication clarity and alignment
- 3. Reviewed sample communications (i.e., agendas, project introduction letters, PowerPoint presentations)
- Built in mechanisms to inform plans for risk/"unintended consequences" as well as to identify
 opportunities through timely meetings with Project Lead as appropriate to key milestones and
 timelines
- 5. Monitored that relevant and key stakeholders had been identified and that all stakeholders were given equal opportunity to participate and provide feedback
- 6. Assisted with the design of the mixed methodology data collection (quantitative and qualitative) to help ensure that the proposed method of collection and questions posed fulfilled the aims of the previously approved overarching research questions. Toward this, the evaluator reviewed the:
 - stakeholder consultation plan, including the stakeholder groups;
 - draft survey questions
 - draft interview guide.
- 7. Reviewed an early draft of the final project report (Advancing Student Transfer through Enhanced data Mobility) to
 - ensure research questions had been addressed
 - assess whether project goals had been met
 - verify data reported.

8. Although not part of the original scope of the evaluator's activities, as an observer attended two different types of consultation meetings led by the Project Lead: a webinar conducted for the national project in June, 2018 to which Ontario colleagues were invited, and a workshop on the project at the annual Ontario Committee of Registrars, Admissions and Liaison Officers (CRALO) meeting in November, 2018 for the purposes of orientation to the project and to learn firsthand some of the questions posed.

B. Examples of Evaluator Input – Formative Process

The evaluator provided verbal and written feedback on a number of aspects throughout the course of the project with the explicit aim of helping to ensure that the project's research questions would be effectively answered and the research aims of the primary investigators met.

National/Ontario Survey

The evaluator's contributions were focused on ensuring

- that respondents knew how data collected would be used;
- clarity on the role of personal identifiers collected as part of the survey;
- clarity around the scope of the project, terminology and language used in the preamble and questions;
- that key definitions were provided where necessary; and,
- that the scales used in the survey responses were appropriate.

Communications/Consultation Materials

The project lead shared prototypes of the variety of communiqués for the project and the evaluator provided feedback (overall clarity, scope) and suggested additional questions for the following:

- Interview questions for in-depth interviews with colleagues
- Template presentation (PowerPoint) used in feedback sessions
- Sample meeting agenda
- Student workshop communiqué.

Stakeholders and Consultations

The following represents a sampling of recommendations made by the evaluator regarding stakeholder consultations:

- that there be more institutions from Northern Ontario consulted and that if geographic constraints were an issue that technology be used to mitigate;
- that there be stand-alone opportunities for francophone institutions to be consulted in French (whether virtually or in-person where possible);
- that some thought be given as to how to include affiliates of institutions in discussions;
- that the definition of internationally-trained students be broadened and clarified as students on a study permit or who are newcomers to Canada are two different target audiences and present different needs.

Discussions were also held between the evaluator and the project lead regarding how to increase the participation rates of certain target groups. Judicious use of standing association meetings and consultations with steering and executive committee colleagues on how to best reach a target group were deemed good mitigation strategies. As well, individual and personal outreach to request individuals respond to the survey was instituted.

One of the stated principles of the project was that it be "learner focused". Although having explicit consultations with students was not part of the original design of the project, this gap was filled soon after project launch with consultations planned and conducted with a variety of student groups across the country.

C. Summation

The pillars of the ONCAT project that seeks to investigate the capacity at Ontario institutions regarding enhanced student data exchange could be summarized as follows:

- Identification of current state
- Readiness/identification of barriers
- Policy and infrastructure implications
- Benefits and challenges
- Best practice
- Systemic and local change needs

These facets were explored by the project lead through a variety of consultation methods such as targeted meetings with relevant stakeholder groups (both in-person and technology mediated), a detailed survey to post-secondary registrarial/systems colleagues, relevant associations, data exchange hubs, etc., an in-depth analysis of the survey and consultation results, a thorough national and international literature and best practice review, and recommendations for moving forward. Limitations of the data received via the survey and consultations were presented and reasons for these limitations were addressed in the final report. It does not appear that the identified limitations have undermined the scope of the project or the quality of the research. In some cases, alternative solutions were found. In other cases, recommendations were made to help inform future projects adopting a similar methodology of data collection with multi-stakeholder groups.

An important design element of the project was the oversight structure put in place whereby the project lead, through the Chair of the Steering Committee and through project partners such as CRALO and OURA, had regular and ready access to expert advice, support, and to colleagues in the field. Local registrarial leaders in the various jurisdictions were also a key resource for the project. This structure enabled the project lead to consult on opportunities, realize synergies that would further the aims of the project, address and mitigate unexpected challenges, and benefit from expert insights and support.

There is evidence of a quality systems check in place: the project lead reported that she sought the expertise of her steering committee colleagues to ensure that she was aware of all available data in the field and that the variety of hard data elements uncovered through a variety of sources (such as OUAC, Statistics Canada, etc.) that were analyzed as part of the research for the report were valid and would help inform the relevant business drivers for the project. As well, the project lead had a system in place to ensure accuracy of data reported by having a research assistant verify the calculations and data sources, as well as cross-checking and performing random spot checks.

Technology was put to good use (e.g., Zoom for meetings and Simple Surveys, electronic survey platform) resulting in economic efficiencies, and which helped ensure a greater number of colleagues were able to participate in the consultations.

REPLICABILITY FEATURES

This was a complex project with many layers of consultation (qualitative and quantitative), a variety of stakeholders and groups, and content that spanned multiple jurisdictions across national/provincial sectors, post-secondary institutions and affiliate organizations. In addition, it was overseen by three distinct national/provincial organizations (ARUCC, ONCAT, BCCAT). Therefore, the capacity of a project lead with breadth and depth of understanding of the various facets of the project, to collaborate, develop partnerships and capitalize on synergies was critical to meeting the outcomes of this type of project.

As stated, an important design element of the project was the oversight and collegial support structure in place providing the project with critical access to expert advice and support.

The mixed methodology data collection model used was also a significant feature of this project and a good prototype for similar projects in future.

CONCLUSION

In summary, it is the opinion of the evaluator formed from an early and ongoing involvement in the project and after reading an early draft of the report that

- the research questions that were designed to inform and assess the capacity for enhanced student data exchange have been rigorously addressed and reflected on in the report prepared by Joanne Duklas, Project Lead.
- the project itself was nimble and able to respond to new opportunities and still maintain scope as evidenced by the inclusion of student groups as a new stakeholder group and an additional session for francophone institutions to cite a couple of examples.
- project goals have been met.
- this project has contributed to building capacity for similar projects and is a good model for strategic, multi-jurisdictional partnerships moving forward.

lu atitutia a	Desien		Other Dataila115
	Region	Sector Amilations	
Algonquin College	Ottawa, Ontario	Ontario Colleges,	Campuses: 5
		Polytechnics Canada,	Credential offerings: diplomas, certificates, degrees
		Colleges and	Enrolments: 21,106 full-time, 1,550 part-time, 1,300 international,
		Institutes Canada	2,301 apprenticeship
			Website: <u>http://www.algonquincollege.com</u>
Cambrian College	Sudbury,	Ontario Colleges,	Campuses: 3
of Applied Arts	Ontario	Polytechnics Canada,	Credential Offerings: diplomas, certificates
and Technology		Colleges and	Enrolments: 4100 full time; 168 part-time; 305 international; 100
		Institutes Canada	apprentice
			Website: <u>https://cambriancollege.ca/</u>
College of the	Cranbrook,	BC Colleges, Colleges	Campuses: 7
Rockies	British	and Institutes Canada	Credential Offerings: diplomas, certificates, associate degrees,
	Columbia		degrees, apprenticeship
			Enrolments: 2009 full-time; 260 international; 330 apprentice;
			Website: http://www.cotr.bc.ca/
Conestoga	Kitchener,	Ontario Colleges,	Campuses: 5
College	Ontario	Colleges and	Credential offerings: diplomas, certificates, degrees
		Institutes Canada	Enrolments: 13,775 full-time, 439 part-time, 2020 international
			Website: http://www.conestogac.on.ca/
Confederation	Thunder Bay,	Ontario Colleges,	Campuses: 9
College	Ontario	Colleges and	Credential Offerings: diplomas, certificates
		Institutes Canada	Enrolments: 8800 students
			Website: http://www.confederationc.on.ca/
Douglas College	New	Colleges and	Campuses: 2
	Westminster,	Institutes Canada	Credential Offerings: degrees, associate degrees, post-degree and
	British		graduate diplomas
	Columbia		Enrolments: 3509 full-time; 6787 part-time; 1550 international
			Website: <u>http://www.douglascollege.ca/</u>
Humber College	Toronto,	Ontario Colleges,	Campuses: 4
Institutes of	Ontario	Polytechnics Canada,	Credential Offerings: bachelor's degrees, diplomas, certificates,
Technology and		Colleges and	graduate certificates, apprenticeship programs
Advanced		Institutes Canada	Enrolments: 29,200 full-time; 23,000 part-time; 3400 international;
Learning			2000 apprentice
			Website: <u>http://www.humber.ca/</u>
Kwantlen	Surry, British	BC Association of	Campuses: 4
Polytechnic	Columbia	Institutes and	Credential Offerings: bachelor's degrees, associate degrees,
University		Universities (BCAIU),	diplomas, certificates, citations, apprenticeships
		Polytechnics Canada,	Enrolments: 16,744 FTE domestic; 6,002 FTE international ¹⁴⁶
		Colleges and	Website: <u>http://www.kpu.ca/</u>
		Institutes Canada,	
		Universities Canada	
La Cité	Ottawa, Ontario	Ontario Colleges,	Campuses: 4
		Association of	Credential Offerings: certificates, diplomas, advanced diplomas,
		Colleges and	graduate certificates, bachelor's,
		Universities of the	Enrolments: 4,557 full-time domestic; 316 international students ¹⁴⁷
		Canadian	Website: http://www.collegelacite.ca/
		Francophonie	
		(ACUFC)	

Appendix B: Post-Secondary Institutions Interviewed

 ¹⁴⁵ Source for college and institute information (unless noted otherwise): Colleges and Institutes Canada. (2018). Our Members. Retrieved from https://www.collegesinstitutes.ca/our-members/member-directory/. Source for university information (unless noted otherwise): University Study Canada. Retrieved from https://www.universitystudy.ca
 ¹⁴⁶ https://www.universitystudy.ca
 ¹⁴⁶ https://www.universitystudy.ca

¹⁴⁷ https://www.collegelacite.ca/documents/10315/11593/La_Cite_SMA2_Final_Version_WEBFeb_16_2018.pdf

Institution	Region	Sector Affiliations	Other Details ¹⁴⁵
Langara College	Vancouver,	BC Colleges, Colleges	Campuses: 2
	British	and Institutes Canada	Credential Offerings: certificates, diplomas, degrees, post-degree
	Columbia		diplomas
			Enrolments: 6388 full-time; 6194 part-time; 2942 international
			Website: <u>http://www.langara.bc.ca/</u>
McMaster	Hamilton,	Council of Ontario	Campuses: 1
University	Ontario	Universities, U15	Credential Offerings: Undergraduate and graduate degrees and
		Group of Canadian	certificates
		Universities,	Enrolments: 27,900 undergraduate; 4,200 graduate; 2,000 part-time
		Universities Canada	Website: <u>https://www.mcmaster.ca/</u>
Medicine Hat	Medicine Hat,	Comprehensive and	Campuses: 2
College	Alberta	Community	Credential Offerings: certificates, diplomas, applied degree
		Institution, ¹⁴⁸	programs, college preparation, apprenticeship trades
		Colleges and	Enrolments: 8,000 students
		Institutes Canada	Website: <u>http://www.mhc.ab.ca/</u>
Ryerson	Toronto,	Council of Ontario	Campuses: 1
University	Untario	Universities,	Credential Offerings: Undergraduate and graduate degrees,
		Universities Canada	Certificates
			time
			Website: http://www.pyercon.ca/
Trent University	Peterborough	Council of Ontario	Campuses: 1
Treffic Oniversity	Ontario	Universities	Credential Offerings: Undergraduate and graduate degrees
	Ontario	Universities Canada	certificates
		oniversities canada	Enrolments: 8,500 undergraduate: 500 graduate: 1,350 part-time
			Website: http://www.trentu.ca/
University of	Vancouver.	Research Universities'	Campuses: 2
, British Columbia	British	Council of British	Credential Offerings: Undergraduate and graduate degrees,
	Columbia	Columbia (RUCBC),	certificates
		U15 Group of	Enrolments: 37,366 undergraduate; 9,522 graduate; 15,000 part-
		Canadian Universities,	time
		Universities Canada	Website: <u>http://www.ubc.ca/</u>
University of	Guelph, Ontario	Council of Ontario	Campuses: 1
Guelph		Universities,	Credential Offerings: Undergraduate and graduate degrees,
		Universities Canada	certificates
			Enrolments: 24,000 undergraduate; 2,700 graduate; 3,500 part-time
			Website: <u>http://www.uoguelph.ca/</u>
University of	Toronto,	Council of Ontario	Campuses: 3
Toronto	Ontario	Universities, U15	Credential Offerings: Undergraduate and graduate degrees,
		Group of Canadian	certificates
		Universities,	Enrolments: 65,600 undergraduate; 17,900 graduate; 8,000 part-
		Universities Canada	time Makaitas https://www.utaraata.co/
	Vieterie Duiti-l-		website: http://www.utoronto.ca/
Victoria	Victoria, British	Kesearch Universities	Campuses: 1 Credential Offeringe: Undergraduate and graduate degrees
VICIONA	Columbia		credential Oriennes: Undergraduate and graduate degrees,
		Universities Canada	Enrolments: 14 304 undergraduate: 2 940 graduate: 4 500 part-time
		Chivershies canada	Website: http://www.uvic.ca/

¹⁴⁸ The Government of Alberta's policy categories for post-secondary institutions follow a 'six-sector model' (Source: Government of Alberta. (Nov. 2007). Roles and Mandates Policy Framework. Retrieved from https://open.alberta.ca/dataset/f84f2391-0eda-45d3-a7c6-e19ca51a2d59/resource/1447ca1d-2370-4c2d-a55f-973197985e1b/download/4178234-2007-11-roles-and-mandates.pdf, p. 17).

Institution	Region	Sector Affiliations	Other Details ¹⁴⁵
York University	Toronto,	Council of Ontario	Campuses: 1
	Ontario	Universities,	Credential Offerings: Undergraduate and graduate degrees,
		Universities Canada	certificates Enrolments: 43,800 undergraduate; 4,400 graduate;
			7,700 part-time
			Website: http://www.yorku.ca/

Organization	Туре	Region	URL	Sent Survey	Participated in Interview Process for ONCAT and BCCAT projects
Alberta Council on Articulation and Transfer (ACAT)	Transfer and Pathway Organization; Data Repository Hub (for courses and agreements)	Alberta	https://acat.alberta.ca/	Yes	Yes
ApplyAlberta	Application Centre and Data Exchange Hub	Alberta	https://applyalberta.ca/	Yes	No
BC Ministry of Education	Government of British Columbia	British Columbia	https://www2.gov.bc.ca/g ov/content/governments/ organizational- structure/ministries- organizations/ministries/e ducation	Yes	Yes
British Columbia Council on Admissions and Transfer (BCCAT)	Transfer and Pathway Organization; Data Repository Hub (for courses and agreements)	British Columbia	http://www.bccat.ca/	Yes	Yes
Campus Manitoba	Government of Manitoba	Manitoba	https://www.saskatchewa n.ca/government/govern ment- structure/ministries/educ ation	Yes	Yes
Canadian Information Centre for International Credentials (CICIC)	Part of the Council of Ministers of Education, Canada (CMEC)	National	https://www.cicic.ca/	Yes	Yes
Council on Articulations and Transfer, New Brunswick (CATNB)	Transfer and Pathway Organization; planning a data exchange hub	New Brunswick	http://catnb.ca/	Yes	Yes
EducationPlannerBC	Application Centre	British Columbia	https://educationplannerb c.ca/	Yes	Yes
Maritime Provinces Higher Education Commission (MPHEC)	Inter-provincial research organization in the Maritimes	New Brunswick, Nova Scotia, Prince Edward Island	http://www.mphec.ca/ind ex.aspx	No	Yes
Nova Scotia Council on Articulation and Transfer (NSCAT)	Transfer and Pathway Organization; Data Exchange Hub	Nova Scotia	https://www.mynsfuture. ca/	Yes	Yes
OCAS (the Ontario College Application Service)	Application Centre and Data Exchange Hub	Ontario	https://www.ontariocolle ges.ca/en	Yes	Yes
Ontario Council on Articulation and Transfer (ONCAT)	Transfer Pathways Organization	Ontario	http://www.oncat.ca/	Yes	Yes
Ontario Universities' Application Centre (OUAC)	Application Centre and Data Exchange Hub	Ontario	https://www.ouac.on.ca/	Yes	Yes

Appendix C: Organizations Involved in the Research

Organization	Туре	Region	URL	Sent Survey	Participated in
					Process for
					ONCAT and
					BCCAT projects
Saskatchewan	High school data	Saskatchewan	https://www.saskatchewa	Yes	No
Ministry of Education	repository		n.ca/government/govern		
			<u>ment-</u>		
			structure/ministries/educ		
			ation		
SRAM (and through it	CEGEP Application	Québec	https://sram.qc.ca/	Yes - SRAM	Yes - SRAM
to SRACQ, SRASL)	Centres; Data Exchange		https://www.sracq.qc.ca/		
	Hubs		dossier/		
			https://srasl.gc.ca/		

Appendix D: Overview of Regional Meetings Supporting the Research

Process

Region	Туре	Institutions and	Audience	Number of	Hosted by
		Organizations Invited		Participants	
Oshawa/Durham	Virtual feedback	Universities: Trent,	Registrarial and	4 people	Trent
	session		systems experts	representing 2	University
		Colleges: Durham		institutions	- ·
Kitchener, Waterloo,	In-person	Colleges: Conestoga,	Registrarial and	18 people	Conestoga
Saint Catherine's,	feedback	Mohawk	systems leadership	representing 6	College
London, Guelph,	session	Universities: Guelph,	and staff	institutions	
Hamilton		Waterloo, Brock, Laurier			
Ottawa, Kingston	In-person	Universities: Ottawa,	Registrar and systems	11 people	Algonquin
	feedback	Carlton, Queens, St.	leadership and staff,	representing 3	College
	session	Paul's	decanal leadership	institutions	
		Colleges: Algonquin, La			
		Cité			
Sudbury	In-person	Universities:	Registrarial and	5 people	Laurentian
	feedback	Laurentian	systems leadership	representing 2	University
	session	Colleges :	and staff	institutions	
		Collège Boréal,			
		Cambrian			
Ontario: pan-	In-person	All Ontario colleges	Registrarial and	64 people from	CRALO
provincial session at	presentation	across Canada	systems leadership	various colleges	
the November 2018	and feedback	OCAS	and staff;	and allied	
Ontario college	session		representatives from	organizations in	
CRALO conference			other third-party	Ontario	
			organizations at		
			conference (e.g.,		
			OCAS, ONCAT,		
			vendors)		
Ontario University	In-person	All Ontario university	Registrarial	23 registrars	University of
Registrars' Forum	feedback	registrars	leadership		Toronto
	meeting				
Ontario University	In-person	Ontario university	Pan-provincial	55 higher	University of
Council on	feedback	admissions and liaison	leadership in higher	education leaders	Toronto
Admissions	meeting	officers, registrars,	education	from across the	
		ONCAT, International		sector	
		Baccalaureate			
		Association, CRALO,			
		Ontario Ministry of			
		Advanced Education			
		and Skills Development			
	virtual feedback	Untario college systems	Pan-provincial system	/ people	Humper
BOLT (Banner) User	meeting	representatives for	leadership in college	representing /	College
Group		Institutions that use	nigher education	Untario colleges	
Conseller	Martunal for a allowed		De sistus vis l	Г noonlo	Openational Inc.
Canadian	virtual feedback	colleges and	kegistrarial	5 people	Organized by
irancoprione post-	meeting	universities across	leadership	representing 3	Primary
secondary	(conducted in	Canada that deliver		institutions	investigator
mstitutions	riench)	education ¹⁴⁹			for Project

¹⁴⁹ The primary investigator invited members of the Association des collèges et universités de la francophonie canadienne (ACUFC), which includes 21 colleges and universities that deliver Canadian francophone education (http://acufc.ca/).

Region	Туре	Institutions and	Audience	Number of	Hosted by
		Organizations Invited		Participants	
BC: pan-provincial	In-person	All BC public and private	Registrarial	29 registrars	Vancouver
meeting with the BC	meeting	post-secondary	leadership, BCCAT	representing 29	Island
Registrars'		institutions	representative	institutions	University
Association					
Canadian Association	National	Canadian and	Data exchange	10 data exchange	CanPESC,
of Post-Secondary	workshop	international	experts	experts	PESC, Ontario
Electronic Standards	retreat meeting	institutions,		representing 7	Universities'
Council User Group		organizations, and		institutions or	Application
(CanPESC)		vendors involved in		application	Centre
		student data exchange		centres/data	(OUAC)
				exchange hubs	

Appendix E: Overview of Primary Canadian Organizations Involved in

Region	Organizations	Transfer	Application	Data	Data Ex	change Services	s Provided	Total PSIs*	Total
		Organization	Centres	nub	Application Data/ Document Exchange	Secondary School Transcript Exchange	PSI Transcript Exchange		
Alberta (AB)	Alberta Council on Admissions and Transfer (ACAT) ApplyAlberta	1	1		1	1	1	25	27
British Columbia (BC)	BC Council on Admissions and Transfer (BCCAT) EducationPlanner BC	1	1		1	-	1	35	38
	BC Ministry of Education			1		1			
Manitoba (MB)	Campus Manitoba	1						9	10
New Brunswick (NB)	CATNB – Council of Articulations and Transfer New Brunswick	1					Planning	15	15
Newfound land & Labrador (NF&LB)	No council or application centre							2	2
North West Territories (NWT)	No council or application centre							2	2
Nova Scotia (NS)	NSCAT – Nova Scotia Council on Admissions and Transfer	1				1	Planning	11	12
Nunavut (NU)	No council or application centre							1	1
Ontario (ON)	ONCAT	1						45	48
	OCAS Inc.		1		1	1	1	24 of 45 above	25 of 48 above
	OUAC – Ontario Universities' Application Centre		1		1	1	1	21 of 45 above	22 of 48 above
Prince Edward PEI	No council or application centre							3	3

Post-Secondary Student Data Exchange

Region	Organizations	Transfer Organization	Application Centres	Data Hub	Data Ex	change Services (for admission	s Provided s)	Total PSIs*	Total Organizations
					Application Data/ Document Exchange	Secondary School Transcript Exchange	PSI Transcript Exchange		
Québec (QC)	CEGEP application centres ¹⁵⁰		3		3	3		48	51
	Bureau de coopération interuniversitaire (BCI)						1	19	20
Saskatche wan (SK)	Saskatchewan Transfer Credit & Pathways Council	1						8	10
	SK Ministry of Education			1		1			
Yukon (YK)	No council or application centre							2	2
Column Totals	Across all organizations	7	7	2	7	9	5	225	241

* Counts for private post-secondary institutions are included in select jurisdictions given the different quality assurance approval processes across the various regions. PSI counts are taken from government websites; not all are included as jurisdictions vary in terms of their quality assurance approach for defining trusted institutions. Inclusion in this chart is not intended to suggest every institution or organization is interested in participating in the national data exchange network. Rather, it is intended to demonstrate the potential scope of interest in a trusted national network. The numbers could fluctuate and are also dependent on future protocols for membership in a national network which have yet to be determined.

¹⁵⁰ Includes SRAM - service régional d'admission du montréal métropolitain; SRASL - Service Régional de l'admission des cégeps du Saguenay – Lac-Saint-Jean; SRACQ - Service régional d'admission au collégial de Québec.

Appendix F: Overall Summary of Data Exchange Strengths and Gaps

						No system-wide	Limited national quality assured
Region	No or limited in- province/ territory high school to post- secondary exchange	No in- province electronic post- secondary to post- secondary exchange	No or limited inter- provincial high school exchange	No or limited inter- provincial post- secondary to post- secondary exchange	No system- wide international exchange	capacity to confirm registered student status at post- secondary institutions (from admission offer to graduation)	resources and tools to support admissions and transfer
Alberta	Exists	Exists	X - AB and SK planning	Х	х	Х	Provincially focused: Province-wide pathway and course equivalency student database exists; ACAT system building capacity towards representing equivalencies outside of province
British Columbia	Exists	Exists	X – students can individually order and send their transcripts outside of province	X - 2 institutions only	х	х	Provincially focused: Province-wide pathway and course equivalency student database exists; extensive provincial transfer supports; a pilot project between BCCAT and University of British Columbia being pursued to enhance national and international equivalency improvements
Manitoba	х	x	х	х	х	х	Provincially focused: Province-wide online course system exists
New Brunswick	X - NB planning	X - NB planning	X – NS & NB planning	X - NS & NB planning	х	Х	Provincially focused: Province-wide pathway and course equivalency student database exists; Support available for PLAR; Extensive transfer and trend research available through MPHEC
Newfoundland & Labrador	х	х	х	х	х	х	
Northwest Territories	х	x	х	х	х	х	
Nova Scotia	Exists	X - NS planning	X - NS and NB planning	X - NS and NB planning	х	Х	Provincially focused: Province-wide pathway and course equivalency student support exists Extensive transfer and trend research available through MPHEC
Nunavut	Х	Х	Х	Х	Х	х	
Ontario	Exists	Exists	х	X - 11 only through OUAC	Х	Х	Provincially focused: Province-wide pathway and course equivalency student database exists through ONCAT; extensive research available
PEI	х	х	х	х	Х	Х	Extensive transfer and trend research available through MPHEC
Quebec	Exists	Exists	Exists	X - CEGEP to OUAC only	х	Х	Provincially focused: Inter-university provincial system exists to support studying at another university

Region	No or limited in- province/ territory high school to post- secondary exchange	No in- province electronic post- secondary to post- secondary exchange	No or limited inter- provincial high school exchange	No or limited inter- provincial post- secondary to post- secondary exchange	No system- wide international exchange	No system-wide capacity to confirm registered student status at post- secondary institutions (from admission offer to graduation)	Limited national quality assured resources and tools to support admissions and transfer
Saskatchewan	X - SK planning	х	X - SK and AB planning	х	х	х	
Yukon	Exists - Through BC Ministry	х	х	х	х	х	

"X" equals *Does not exist;* Source for data: interviews, website reviews, ARUCC Groningen Project (<u>http://arucc.ca/en/project-overview.html</u>) – Findings as of July 2018; subject to change.

Appendix G: Survey Findings

National Bilingual Survey Demographics

The survey received 117 responses across 109 organizations.¹⁵¹ These 117 respondents represent 47 colleges (40%), 4 institutes (3%), 53 (45%) universities, 7 application centres and government data hubs (6%), and 6 councils and associations (5%).¹⁵² Of these, 100 respondents completed the survey representing a completion rate of 85%. The dataset for the current state analysis focused on 99 of these organizations.¹⁵³ All responses across all organization types including duplicate responses are included in the analyses that identifies expert opinions. Therefore, 'n' counts are noted throughout.

Out of 86 institutions within the pool of 99 organizations, 11 identified as private institutions, 2 as *Other*, and 73 as publicly funded post-secondary institutions (Figure 17). The total number of public post-secondary institutions equals 76 once those with contradictory responses are readded. The survey received a 37% response rate out of a total pool of 204 publicly funded post-secondary institutions from across Canada (76/204).¹⁵⁴ Twenty-four (27%) of these 76 represented responses for Ontario publicly funded institutions that maintain ONCAT membership (10 colleges/institutes and 14 universities). Fifty-three percent (24/45) of these participated in the survey. Of these, 42% of the Ontario colleges/institutes participated in the survey (10/24) versus 67% of the universities (14/21); therefore, the analysis combines the results for these two groups unless explicitly noted.

Figure 18 details the data exchange practices reported for each of the organizations.

¹⁵¹ The 109 excludes eight duplicate responses across seven organizations.

¹⁵² Eight people that identified their organization under *Other* were subsequently reviewed and realigned to facilitate data analysis as the numbers were low. Once realigned, five represented councils on admission/articulation and transfer, two were from post-secondary institutions serving the college sector, and one was from an association representing chief information officers. Many of these organizations serve broader roles in their jurisdictions (e.g., one is both a council and a data exchange hub); hence, their different approaches to describing their organizations.

¹⁵³ This approach resolved for duplicates and contradictory responses for a given organization. This subset includes 7 application centres and data hubs, 6 councils on articulation and transfer, and 86 post-secondary institutions. The latter group excludes three post-secondary institutions from the current state analysis because respondents from the same institution provided contradictory responses to the same questions.

¹⁵⁴ Duplicate responses per institution are not included. Given the different approaches to quality assurance approvals in the different provinces, it is not possible to conduct the same analysis for private institutions.



Figure 17: Organization Type - Current Data Exchange Practices (n=99)

FN 3: Excludes institutions and their respondents that provided contradictory responses. The above Figure includes one response per organization.

Funding Suggestions for the National Network

Ontario post-secondary institutions and their national counterparts were asked to provide recommendations for funding the national data network (Figure 18, Table 18). Most in Ontario believe the network should rely on fees for service and cost recovery more so than their counterparts in other provinces. Strong preferences exist for accessing government funding to support the project, a graduated fee for institutions, and requesting support from associate members.



Figure 18: Should the National Network Rely on Cost Recovery and Fees for Service Models (n=100)?

FN 4: More than one respondent per organization represented in opinion type Figures and Tables. 'N' counts are adjusted accordingly.

	Federal Government Funding		Provincial Government Funding		ARUCC Associate Members - Standardized Flat Fee		Post-secondary Institutions - Standardized Flat Fee		Post-secondary Institutions - Graduated Fee	
Region (ON=29; Other Provinces=74)	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces
Strongly Agree	41%	54%	38%	46%	10%	7%	3%	1%	24%	15%
Agree	28%	23%	38%	28%	28%	24%	17%	7%	31%	49%
Disagree	10%	1%	7%	3%	14%	20%	38%	35%	17%	11%
Strongly Disagree	0%	0%	0%	0%	3%	7%	14%	30%	0%	3%
No Opinion	21%	22%	17%	23%	45%	42%	28%	27%	28%	23%
Column %	29, 100%	74, 100%	29, 100%	74, 100%	29, 100%	74, 100%	29, 100%	74, 100%	29, 100%	74, 100%

Table 18: Suggested Source of Funding to Sustain the National Entity after Implementation

Other Recommendations Related to Document Fraud

The survey confirmed the importance of ensuring incoming and outgoing document validation occurs to support authenticating the official bone fides of student documents, a helpful finding given the concerns about document fraud (Figure 19). For example, 73% of Ontario respondents and 78% of respondents from other provinces indicated that incoming document validation is *very important*. Three respondents to this question, one of whom was from Ontario, provided qualitative commentary that emphasized the importance of establishing trusted connections as a method to mitigate fraud.¹⁵⁵ This theme arose routinely in interviews and regional meetings. Establishing trusted connections either directly with institutions or through recognized application centres and data hubs represents one way to make best efforts to address document fraud.¹⁵⁶

¹⁵⁵ Two further noted that the national network should enable trusted connection and partnerships but not alter the original content of data files or documents.

¹⁵⁶ Having noted this, even the application centres and data hubs like the national hub need to ensure partners are trusted.



Figure 19: Organizational Perspective regarding Verification of Official Documents – Incoming and Out-going

Data Exchange Needs

Most Ontario organizations (43% of 28 respondents) and those from other provinces (29% of 73 respondents) expect data to be exchanged on a schedule as a mandatory requirement; 39% and 56% respectively would highly desire real time data exchange, to the extent possible. Organizational respondents in Ontario and from other provinces want maximum flexibility from the national network whether for data exchange formats, batch exchange capacity, individual record exchange, or ability to manage exchange from multiple devices (Table 19). In two separate survey questions, respondents provided indications about their desire for the national network to be able to crosswalk data; the finding of 89% for Ontario and 90% for other provinces held for both questions.

While there are slight variations in desired level of functionality between Ontario and the other provinces (Table 20), the interest exists for the power to choose what is sent and received and in what format. Most respondents from Ontario and other provinces desire the flexibility to choose whether to send specific data fields or an entire student record (Table 21), again signalling a desire for flexibility. Most Ontario respondents (93% of 28) and those from other provinces (82% of 73) indicated a desire for specific APIs to facilitate standardized data exchange.¹⁵⁷

¹⁵⁷ Application Programming Intervals (APIs) standardizes and facilitates communication between different components by providing routines, protocols, and tools to allow sharing of data between software (MIT Libraries, n.d.).

Table 19: Data Exchange Preferences for Organizations Responding to Survey

	Data Exchange in Multiple Formats (XML, EDI, etc.)		Batch Exchange		Individual Record Exchange		Ability to Manage Exchange from Multiple Devices	
Region (ON=28)	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces
Desired	89%	90%	93%	89%	86%	94%	71%	84%
Not Desired	7%	7%					7%	3%
Not Applicable/Don't Know	4%	3%	7%	11%	14%	6%	21%	14%
Column Totals	28, 100%	71, 100%	28, 100%	73, 100%	28, 100%	72, 100%	28, 100%	73, 100%

Table 20: Desired Functionality

Ability to	Suppress Student Data		Choose Wh	at Data to Send	Choose What Data to Receive		
Region	Ontario	Other Provinces	Ontario	Other Provinces	Ontario	Other Provinces	
Mandatory	25%	32%	29%	32%	29%	32%	
Highly Desirable	18%	14%	25%	30%	25%	30%	
Desirable	25%	11%	25%	19%	25%	18%	
Not Desirable	14%	18%	11%	14%	11%	12%	
Not Applicable/Don't Know	18%	26%	11%	5%	11%	8%	
Column Totals	28, 100%	73, 100%	28, 100%	73, 100%	28, 100%	73, 100%	

Table 21: Preferences for what is Exchanged

Ability to	Provide speci	ific data fields	Provide specific student records		
Region	Ontario	Other Provinces	Ontario	Other Provinces	
Mandatory	14%	11%	14%	1%	
Highly Desirable	39%	37%	29%	36%	
Desirable	21%	14%	18%	4%	
Not Desirable	21%	34%	36%	56%	
Not Applicable/Don't Know	4%	3%	4%	3%	
Column Totals	28, 100%	72, 100%	28, 100%	73, 100%	

Recommendations for Type of Information to Exchange

The findings suggest clear priorities exist with respect to the types of information respondents from Ontario and other provinces recommend be the focus for the national network (Table 22). This suggests a potential roadmap for incremental development of the network. Consistency exists between regions with post-secondary transcript exchange and graduate confirmation representing the highest priorities. Language test results ranked third for the other provinces unlike the Ontario respondents. Transfer assessment requires official post-secondary transcripts; therefore, this represents a strong indication of support for improving exchange to support students moving between post-secondary institutions. Confirmation of graduation ranks second for Ontario which validates the thematic feedback from the interviews and regional meetings regarding the interest in developing national capacity to enhance confirmation of student and alumni status.

		Interested	Not	Already	Not	Don't
Post-secondary Transcripts	Ontario	89%	Interested	exists		KNOW
	Other Breederse	00%	070	70/	070	20/
	Other Provinces	88%	1%	7%	1%	3%
Graduate Confirmation	Ontario	85%	0%	0%	0%	15%
	Other Provinces	89%	1%	3%	3%	4%
Secondary Transcripts	Ontario	85%	0%	4%	0%	11%
	Other Provinces	79%	4%	5%	8%	3%
Admissions Information	Ontario	85%	0%	0%	7%	7%
	Other Provinces	75%	7%	3%	3%	12%
Proof of Enrolment	Ontario	78%	4%	0%	4%	15%
	Other Provinces	85%	4%	1%	3%	7%
Credential Evaluation	Ontario	78%	4%	4%	0%	15%
	Other Provinces	71%	8%	0%	4%	16%
Language Test Results	Ontario	74%	0%	4%	4%	19%
	Other Provinces	81%	3%	1%	5%	10%
Other (Examples cited: graduate test	Ontario	4%	0%	0%	33%	63%
results (GRE, 'Tage Mage', GMAT), sanction alerts, instances of fraud, course outlines, transfer credit equivalency information)	Other Provinces	4%	3%	0%	59%	34%

Table 22: Prioritization for Student Information to Focus Implementation Efforts of National Network.

References

- AACRAO. (2018). *Best Practice Advice for PDF Exchange*. Retrieved May 28, 2018, from AACRAO: https://www.aacrao.org/resources/electronic-records-data-exchange/aacrao-best-practices-forpdf-transcript-exchange
- Adan, E. (n.d.). *The Forensics of Academic Credential Fraud Analysis and Detection.* Washington, D.C.: NAFSA. Retrieved March 15, 2019, from https://www.nafsa.org/uploadedFiles/NAFSA_Home/Resource_Library_Assets/ACE/forensics_o f_academic.pdf?n=6546
- Burbidge, J., & Finnie, R. (2000). The Inter-Provincial Mobility of Baccalaureate Graduates: Who Moves and When. Canadian Journal of Regional Science, XXIII: 3 (Autumn/automne 2000), XXIII: 3(Autumn 2000), 377-402. Retrieved March 14, 2019, from http://www.cjrsrcsr.org/archives/23-3/Burbidge.pdf
- Canadian Bankers Association. (2018, May 30). *White Paper: Canada's Digital ID Future: A Federated Approach.* Retrieved from Canadian Bankers Association: https://cba.ca/embracing-digital-id-in-canada
- Canadian Information Centre for International Credentials. (1990-2019). Other international agreements. Retrieved from cicic.ca: https://www.cicic.ca/1409/unesco_global_convention_on_the_recognition_of_higher_educatio n_qualifications.canada
- Canadian University Council of Chief Information Officers (CUCCIO). (n.d.). *IT Security: Have Universities Become Targets?* Retrieved March 27, 2019, from CUCCIO: https://www.cuccio.net/en/news-updates/45-it-security-have-universities-become-targets.html
- Chakroun, B., & Keevy, J. (2018). *Digital Credentialing: Implications for the recognition of learning across borders.* Paris, France: United Nations Educational, Scientific and Cultural Organization. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000264428
- Colleges Ontario. (2009). *Student Mobility between Ontario's colleges and universities*. Retrieved 15 2019, February, from Colleges Ontario: https://www.collegesontario.org/research/student-
- Dowling, A. (2018a). Presentation to ARUCC GDN Group. Digitary.
- Dowling, A. (2018b). *Blockchain Position Paper*. Digitary. Retrieved from http://www.arucc.ca/uploads/Digitary_Blockchain_Paper_FINAL_June_2018.pdf
- Duklas, J. (January 2019). International Transfer Credit Practices. Retrieved from https://www.bccat.ca/pubs/Intl_Transfer_Credit.pdf: British Columbia Council on Admissions and Transfer. Retrieved from https://www.bccat.ca/pubs/Intl_Transfer_Credit.pdf
- Educause. (2019a). Information Security Guide: Effective Practices and Solutions for Higher Education. Retrieved March 14, 2019, from https://www.educause.edu/focus-areas-and-initiatives/policyand-security/cybersecurity-program/resources/information-security-guide

- Educause. (2019b, January 28). *Top IT Issues, 2019: The Student Genome Project*. Retrieved February 15, 2019, from Edcause Review: https://er.educause.edu/articles/2019/1/top-10-it-issues-2019-the-student-genome-project
- Educause. (2019c, January 23). *Higher Education Cloud Vendor Assessment Tool*. Retrieved March 19, 2019, from Educause: https://library.educause.edu/resources/2016/10/higher-education-cloud-vendor-assessment-tool
- Educause. (n.d.). Vendor and Third Party Management. Retrieved March 20, 2019, from Educause: https://www.educause.edu/focus-areas-and-initiatives/policy-and-security/cybersecurityprogram/resources/information-security-guide/vendor-and-thirdparty-management
- European Commission. (2019, February 1). *Blockchain Technologies*. Retrieved February 15, 2019, from https://ec.europa.eu/digital-single-market/en/blockchain-technologies
- Giles, D., & Craig, M. (2018, August 14). Immigration fraud charges laid agains man. Retrieved March 15, 2019, from Global News: https://globalnews.ca/news/4386547/immigration-fraud-saskatoonman-cbsa/
- Government of Canada. (2017, December 22). *Authentication of diplomas and transcripts*. Retrieved March 18, 2019, from Government of Canada: https://international.gc.ca/worldmonde/study_work_travel-etude_travail_voyage/authenticationauthentification/diplomas_transcripts-diplomes_releves_notes.aspx?lang=eng
- Government of Ontario. (2012-19). Collection and use of postsecondary education enrolment information. Retrieved March 18, 2019, from Government of Ontario: https://www.ontario.ca/page/collection-and-use-postsecondary-education-enrolmentinformation
- Gower, M., & Hartman, J. (2019c). *Issue #5: Digital Integratoins*. Retrieved February 15, 2019, from Educause: https://er.educause.edu/articles/2019/1/top-10-it-issues-2019-the-student-genomeproject#issue5
- Heath, N. (2012). *Student Mobility in Canada*. Pan-Canadian Consortium on Admissions and Transfer. Retrieved from https://pccatweb.org/media/1244/pccat_mainreport_final-en-full-documentwith-logos.pdf
- Heslop, J. (2010, May). Student Transitions into Post-Secondary Education Sectors B.C. Public, B.C. Private and Non-B.C. Institutions. Retrieved March 29, 2019, from BCCAT.ca: https://www.bccat.ca/pubs/STP_RR_MAY_2010.pdf
- Hickey, D., & Otto, N. (2017, February 13). Endorsement 2.0: Taking Open Badges and E-Credentials to the Next Level. Retrieved March 24, 2019, from https://nebula.wsimg.com/447a99a5a6e4fe4d12eb706fd7b55a23?AccessKeyId=4CF7FAE11697 F99C9E6B&disposition=0&alloworigin=1
- Information and Privacy Commissioner of Ontario. (2014). *Ontario's Freedom of Information and Protection of Privacy Act - A Mini Guide.* Toronto, On: Information and Privacy Commissioner of

Ontario. Retrieved December 12, 2018, from https://www.ipc.on.ca/wp-content/uploads/Resources/provincial%20guide-e.pdf

- Information and Privacy Commissioner of Ontario. (n.d.). *Role and Mandate*. Retrieved March 19, 2019, from IPCO: https://www.ipc.on.ca/about-us/role-and-mandate/
- Internet of Things. (2016). *IERC Objectives*. Retrieved February 15, 2019, from IERC: http://www.internet-of-things-research.eu/
- IPCO. (2018, March). *Disposing of your electronic media*. Retrieved March 19, 2019, from IPCO Technology Fact Sheet: https://www.ipc.on.ca/wp-content/uploads/2018/03/fs-tech-disposingof-your-electronic-media-003.pdf
- James, T., & McMillan, A. (2016). *Applicant Data in Centralized Application Agencies and the Implications for British Columbia*. Vancouver, BC: British Columbia Council on Admissions and Transfer. Retrieved March 20, 2019, from http://www.bccat.ca/pubs/ApplicantData_Nov2016.pdf
- Maritime Provinces Higher Education Commission. (2013, January). *Trends in Maritimes Higher Education: Portable Learning.* Retrieved from MPHEC: http://www.mphec.ca/resources/TrendsV10N1_2013.pdf
- Maritime Provinces Higher Education Commission. (2019, January). *Trends in Maritime Higher Education: Annual Digest 2017-2018*. Retrieved March 24, 2019, from MPHEC: http://www.mphec.ca/media/176647/Annual-Digest-2017-2018.pdf
- Ministry of Training, Colleges and Universities. (2015-16). *Enrolment Reporting and Audit Guidelines*. Retrieved from Government of Ontario: http://www.tcu.gov.on.ca/pepg/documents/EnrolmentReportingandAuditGuidelines2015-2016.pdf
- MIT Libraries. (n.d., March 18). APIs for Scholarly Resources. Retrieved 2019, from Scholarly Publishing MIT Libraries: https://libraries.mit.edu/scholarly/publishing/apis-for-scholarly-resources/
- National Research Council Canada. (2018, August 20). *Exploring blockchain for better business*. Retrieved March 24, 2019, from Government of Canada: https://www.nrccnrc.gc.ca/eng/stories/2018/blockchains.html
- National Student Clearinghouse, Educause, REN-ISAC. (2018). Why Cybersecurity Matters: and What Registrars, Enrollment Managers and Higher Education Should Do About It. Herndon, VA: National Student Clearinghouse. Retrieved March 19, 2019
- Ontario Undergraduate Student Alliance (OUSA). (2017, February 22). *Accessibility Results from the 2015 Ontario Post-Secondary Student Survey.* Retrieved March 30, 2019, from OUSA Research Reports: https://www.ousa.ca/research_reports
- Open Badges. (2016). *Frequently Asked Questions*. Retrieved March 24, 2019, from Open Badges: https://openbadges.org/faq/
- Oxford Dictionnaries. (2019). *Dictionary*. (Oxford University Press) Retrieved March 18, 2019, from English Oxford Living Dictionnaries: https://en.oxforddictionaries.com/definition/apostille

- Pan-Canadian Consortium on Admissions and Transfer. (2017, June 8). *Provincial Councils on Credit Transfer Expand Agreement to Enhance Student Mobility in Canada*. Retrieved from Pan-Canadian Consortium on Admissions and Transfer: https://pccatweb.org/news/provincialcouncils-on-credit-transfer-expand-agreement-to-enhance-student-mobility-across-canada/
- Parmenter, N. (2019, February 13). Canada needs a robust digital ID system. Retrieved March 27, 2019, from Policy Options: http://policyoptions.irpp.org/magazines/february-2019/canada-needs-robust-digital-id-system/
- Patel, N. (2018). *Malta Pilots Blockchain-based Credentials Program*. Retrieved March 24, 2019, from IEEE Spectrum: https://spectrum.ieee.org/tech-talk/computing/networks/malta-pilots-blockchainbased-credentials-program
- Popovic, T. (2012). Credit Transfer and Student Mobility in Ontario. Toronto, Ontario: College Student Alliance. Retrieved from https://docs.wixstatic.com/ugd/0b1b3b_c7a8d8e56eb14448965b49a82bea84d7.pdf
- Purushotham, S. (2018, May 14). Using blockchain to unchain education. Retrieved March 24, 2019, from Khaleej Times: https://www.khaleejtimes.com/business/local/using-blockchain-tounchain-education
- Rankin, E. (2016, December 6). Fake job, fake education, fake residency: 15 clients of fraudulent immigration scheme deported. Retrieved March 15, 2019, from CBC: https://www.cbc.ca/news/canada/british-columbia/fake-job-fake-education-fake-residency-15clients-of-fraudulent-immigration-scheme-deported-1.3886719
- Saul, S. (2016, June 6). Indian Students Lured by Recruiters Asked to Leave University. Retrieved March 27, 2019, from The New York Times: https://www.nytimes.com/2016/06/07/us/indianstudents-western-kentucky-university.html
- Schmidt, C. (2018, August 1). Calgary man accused of creating and selling forged student transit passes. Retrieved March 15, 2019, from CTV News: https://calgary.ctvnews.ca/calgary-man-accused-ofcreating-and-selling-forged-student-transit-passes-1.4036492
- Shapiro, D., Dundar, A., Huie, F., Wakhungu, P., Bhimdiwali, A., Nathan, A., & Youngsik, H. (2018, July). *Transfer and Mobility: A National View of Student Movement in Postsecondary Institutions, Fall* 2011 Cohort (Signature Report No. 15). Herndon, VA: National Student Clearinghouse Research Center. Retrieved from https://nscresearchcenter.org/signaturereport15/?hilite=%27transfer%27%2C%27rates%27
- Shipley, D. (2015, September 28). *The Cyber Siege of Higher Education in North America*. Retrieved March 24, 2019, from Educause Review: https://er.educause.edu/blogs/2015/9/the-cybersiege-of-higher-education-in-north-america
- Southern Alberta Institute of Technology. (December 17, 2018). SAIT first in Canada to issue digital credentials through blockchain. Retrieved from https://www.sait.ca/about-sait/media-centre/news-and-events/news/2018-12-17-sait-first-in-canada-to-issue-digital-credentials-through-blockchain.

- The Nassau Guardian. (2018, July 31). *The Bahamas releases national platform for digital certificates using blockchain technology*. Retrieved March 24, 2019, from The Nassau Guardian: https://thenassauguardian.com/2018/07/31/the-bahamas-releases-national-platform-for-digital-certificates-using-blockchain-technology/
- Tobenkin, D. (2011). Keeping it Honest. *International Educator*, 32-42. Retrieved March 15, 2019, from https://www.nafsa.org/_/File/_/ie_janfeb11_fraud.pdf
- Trines, S. (2017, December 10). Academic Fraud, Corruption, and Implications for Credential Assessment. Retrieved March 15, 2019, from World Education News and Reviews: https://wenr.wes.org/2017/12/academic-fraud-corruption-and-implications-for-credentialassessment
- Universities Canada. (n.d.). *Facts and Stats*. Retrieved March 24, 2019, from Universities Canada: https://www.univcan.ca/universities/facts-and-stats/
- Vermesan, O., & Bacquet (eds), J. (2017). Cognitive Hyperconnected Digital Transformation. The Netherlands: River Publishers. Retrieved March 7, 2019, from http://www.internet-of-thingsresearch.eu/pdf/Cognitive_Hyperconnected_Digital_Transformation_IERC_2017_Cluster_eBook _978-87-93609-10-5_P_Web.pdf
- Weins, A., & Fritz, M. (2018). Shedding Light on the Next Generation of Mobile Students. *Student Pathways Higher Education Conference*. Toronto, Ontario: ONCAAT. Retrieved from https://www.oncatconference.com/2018/documents/papers/A4.pdf
- Zavarise, I. (2018, December 14). UPEI sees increase in fraudulent international student applications. Retrieved March 15, 2019, from CBC: https://www.cbc.ca/news/canada/prince-edwardisland/pei-upei-fraudulent-international-student-applications-1.4811385
Exhibits

Exhibit A – National Survey

Canadian Student Data Exchange Survey 2018

July 2018

This survey seeks to capture the current state and perspectives regarding electronic student data exchange in Canadian post-secondary institutions and allied organizations. The resulting data will inform three projects: the ARUCC Groningen and Student Mobility Project, and two research studies funded separately by the Ontario Council on Articulation and Transfer (ONCAT) and the British Columbia Council on Admissions and Transfer (BCCAT). More details regarding these three research projects are available online.

We anticipate the results of this research will be published as two separate studies by BCCAT and ONCAT in Spring 2019.

Response Deadline: December 5, 2018

Responses per Institution or Organization: more than one response per institution/organization is acceptable; however, we strongly recommend you coordinate responses and make one online submission through the Registrar's Office or other central department as appropriate for your organization.

Time to Completion: Approximately 20-35 minutes (timing dependent on participant responses to questions)

Participants Recommended:

- Registrarial experts with knowledge of systems
- IT staff with expertise in electronic student data exchange policies, practices, and technology infrastructure
- Staff with expertise in international assessment practices who would have knowledge of international organizations involved in electronic exchange of student data

The survey is being distributed to registrarial and systems leaders at post-secondary institutions and allied organizations across Canada. If you have received the survey and know of others at your institution or organization that have expertise in these areas, please forward this survey to their attention.

Note that all submissions will remain confidential and all published research will be anonymized. More background information on how the data will be used is available online.

Survey Structure:

- Institutional/Organizational Demographic and Participant Information
- Current Data Exchange Capacities
- Business Needs for a National Platform in Canada

Participation: Voluntary

Questions: Joanne Duklas, joanne@duklascornerstone.ca

Please provide your name.

This information will assist the researchers if they need to clarify any of your responses.

Your Title:

Your email address:

Your department:

- O Central Registrar's/Admissions Office
- O CIO or Information Technology Office
- O Other, please specify:

Please provide the following information regarding your institution or organization.

Institution/Organization Location:

- O Alberta
- O British Columbia
- O Manitoba
- O New Brunswick
- O Newfoundland and Labrador
- O Nova Scotia
- O Ontario
- O Prince Edward Island
- O Quebec

0	Saskatchewan
0	Northwest Territories
0	Nunavut
0	Yukon

Institution/Organization Name:

Institution/Organization Type:

- O Application Centre
- O College
- O Government
- O Institute
- O University
- O Other, please specify:

Is your institution/organization:

- O Public
- O Private
- O Other, please specify:

Are you able to answer questions regarding your organization's data exchange capabilities?

0	Yes
0	No

The following questions ask about your institution's or organization's capacities to electronically exchange student data with other Canadian organizations and institutions.

We engage in electronic student data exchange with the following Canadian allied organizations... (Check all that apply.)

	Send to	Receive from	Plan to Send	Plan to Receive	l don't know	Not applicable
EducationPlannerBC						
BCCAT						
ApplyAlberta						
Campus Manitoba						
OUAC						
OCAS						

We engage in electronic student data exchange with the following Canadian allied organizations... (Check all that apply.)

	Send to	Receive from	Plan to Send	Plan to Receive	l don't know	Not applicable
Bureau de coopération interuniversitaire (BCI)						
SRAM (QC)						
SRAQ (QC)						
SRASL (QC)						
NBCAT						
NSCAT						

We engage in electronic student data exchange with the following Canadian government entities... (Check all that apply.)

	Send to	Receive from	Plan to Send	Plan to Receive	l don't know	Not applicable
Federal Government Ministries						
Provincial Government Ministries						

We engage in electronic student data exchange with the following Canadian educational organizations... (Check all that apply.)

	Send to	Receive from	Plan to Send	Plan to Receive	l don't know	Not applicable
Secondary School districts/boards						
Post-Secondary Institutions						

We engage in electronic student data exchange with the following third-party entities... (Check all that apply.)

	Send to	Receive from	Plan to Send	Plan to Receive	l don't know	Not applicable
Apprenticeship/Trades Associations						
Employers/Business Sector						
Regulatory Bodies (e.g., Ontario College of Teachers, etc.)						
External Credential Evaluators						
Other						

If you checked 'Other', please specify the name(s) of the organizations with which your institution or organization exchanges student data. If you chose "not applicable" or "I don't know", ignore this section.

We electronically exchange.... (Check all that apply.)

	Send	Receive	Plan to Send	Plan to Receive	l don't know	Not Applicable
Admissions data						
Co-curricular data						
Diploma related data						

Financial aid data			
Graduation confirmation data			
Language proficiency test data			
Post-Secondary transcript data			
Proof of enrolment data			
Secondary school transcript data			
Other			

If you clicked on 'Other', what other student data does your organization exchange? If you chose "I don't know" or "Not Applicable", ignore this section.

We use the following data standards when exchanging student data within Canada. (Check all that apply.)

	For Sending	For Receiving	Plan to use for sending	Plan to use for receiving	l don't know	We don't use this/not applicable
EDI (ANSI X12)						
Flat File						
JSON						
PDF						
PDF/A (PDF w/ meta-data embedded)						
PESC XML						
XML						
Other						

If you chose 'Other', provide additional information. If you chose "not applicable" or "I don't know", ignore this section.

The following questions ask about your institution's or organization's capacities to exchange data with INTERNATIONAL organizations and institutions.

We engage in electronic student data exchange with the following INTERNATIONAL organizations... (Check all that apply.)

	Send to	Receive from	Plan to send to	Plan to receive from	l don't know	Not Applicable
CHESICC (CHN)						
Digitary / My eQuals (AUS/NZ)						
GradIntelligence (UK)						
National Student Clearinghouse (US)						
Scripsafe (US)						

We engage in electronic student data exchange with the following INTERNATIONAL organizations... (Check all that apply.)

	Send to	Receive from	Plan to send to	Plan to receive from	l don't know	Not Applicable
CollegeBoard (AP Scores) (US)						
Credential Solutions (US)						
International Baccalaureate Org. (UK)						
Parchment (US)						
Other						

If you clicked on 'Other', with which other international organizations do you exchange data? If you chose "Not applicable" or "I don't know", ignore this section.

We electronically exchange the following student data with INTERNATIONAL organizations. (Check all that apply.)

	Send	Receive	Plan to Send	Plan to Receive	l don't know	Not Applicable
Secondary school transcript data						
Post-Secondary transcript data						
Admissions data						
Co-curricular data						

Graduation confirmation data			
Diploma related data			
Language proficiency test data			
Proof of enrolment data			
Other			

What other student data does your organization exchange? If you chose "I don't know" or "Not applicable", ignore this section.

We use the following data standards when exchanging with INTERNATIONAL organizations... (Check all that apply.)

	For Sending	For Receiving	Plan to Send	Plan to Receive	l don't know	We don't use this/not applicable
EDI						
Flat File						
JSON						
PDF						
PDF/A (PDF w/ meta-data embedded)						
PESC XML						
XML						
ELMO XML						
Other						

What other data exchange format does your organization use for exchange student data? If you chose "I don't know" or "we don't use this", ignore this section.

The following questions seek to clarify your institution's or organization's student systems.

Where does your organization store student data? Check all that apply.

At a physical location on-site

At a physical location off-site
In a hosted cloud storage
Other, please specify:
I don't know

If applicable, provide the name of the third-party provider who is hosting student data for your organization.

What student system does your organization use to centrally store student data? Check all that apply.

	Banner
	Colleague
	Datatel
	PeopleSoft
	PowerCampus
	Tribal
	Developed In-House
	Other
	We don't use an SIS
Please	indicate what other systems your institution uses.

What Learning Management System (LMS) does your organization use, if any?

Blackboard

	Desire2Learn
	Moodle
	Other
	We don't use a Learning Management System
Please	indicate what other Learning Management System(s) your institution uses.

In which standard(s) does your organization store electronic student data? (Check all that apply.)

EDI
JSON
PESC XML
XML
PDF
Other

Specify the other data standard(s) used.

Does your institution/organization transform student data in-house to support receiving/sending electronic student data? (I.e, we transform in-bound EDI to XML; we transform out-bound PDF to EDI)

0	Yes
0	No
0	l don't know

Does your institution/organization rely on a third-party organization to transform student data to support receiving/sending electronic student data?

0	Yes
0	No

O I don't know

Provide details

Which area(s) is responsible for establishing electronic student data exchange with an outside organization? (Check all that apply.)

Information Technology Department
internation reenhology Department

Registrar's	Office
-------------	--------

- □ Other
- □ Not Applicable

Provide details.

The questions in the following section are intended to gauge what online student services your organization currently provides.

Does your organization offer an ONLINE CREDENTIAL verification service?

- O Yes, we offer online credential verification
- O Yes, we verify our credentials using an external third-party service
- O No, we do not have an online credential verification service

Specify the third-party used.

Does your organization offer an ONLINE ENROLLMENT verification service?

O Yes, we offer online enrollment verification

O Yes, we verify enrollment(s) using an external third-party service

O No, we do not have an online enrollment verification service Specify the third-party service used.

Does your organization offer ONLINE document verification services?

- O Yes
- O No

0	I	don't	know

Please provide details.

Is your organization engaged in any micro-credentialing or badging initiatives to support students?

- O Yes
- O No
- O I don't know
- O We are planning this

Please provide details.

Is your organization engaged in any block-chain initiatives or research for students?

- O Yes
 O No
- O I don't know

Please provide details.

The following questions are intended to understand any possible considerations that might impact on your organization's ability to establish data exchange connectivity.

In your opinion, does your organization currently have the project management expertise to establish data exchange functionality with an outside organization?

0	Yes, definitely
0	Yes, probably
0	Unsure/Neutral
0	No, probably not

O No, definitely not

In your opinion, does your organization currently have the in-house IT expertise to implement data exchange functionality with an outside organization?

Yes, definitely
Yes, probably
Unsure/Neutral
No, probably not

O No, definitely not

Rank the extent to which the following, if any, will impede your organization's ability to connect to a national data exchange platform.

A gr dea	eat Considerably	Moderately	Slightly	Not at all	l don't know

Commitment to current processes	0	0	0	0	0	0
Focus on other organizational priorities	0	0	0	0	0	0
Inability to change current processes	0	0	0	0	0	0
Inflexible IT systems (SIS, LMS, etc.)	0	0	0	0	0	0
Lack of buy-in for a national platform solution	0	0	0	0	0	0
Lack of financial resources at my organization	0	0	0	0	0	0
Lack of in-house IT expertise	0	0	0	0	0	0
Lack of in-house staff resources	0	0	0	0	0	0
Other	0	0	0	0	0	0

Describe other examples that might impact on your organization's ability to connect to a national data exchange platform. If you selected "Not at all" or "I don't know", leave this section blank.

Are there any existing policies in place at your organization that might impede data exchange with outside organizations?

O Yes

O No

O I don't know

Provide details.

Is there anything else about your organization that you feel we should be aware of as we contemplate creating a national student data exchange platform? If none, please proceed forward in the survey.

Business Requirements - General

The following questions are intended to gauge the overall requirements for a national data exchange platform.

What benefits must result from a national data exchange platform? Rank the importance of each item.

	Very Important	Important	Moderately Important	Slightly Important	Not Important	Neutral/No Opinion
Enhanced efficiencies for students	0	0	0	0	0	0
Enhanced efficiencies for institutions	0	0	0	0	0	0
Improved service for students	0	0	0	0	0	0
Improved service for institutions	0	0	0	0	0	0
Improvements for those students wishing to transfer between Canadian institutions	0	0	0	0	0	0
Improvements for international students wishing to study in Canada	0	0	0	0	0	0
Improvements for students wishing to study outside Canada (e.g., exchange, study abroad)	0	0	0	0	0	0
Improvements to enhance transition of students into the workplace	0	0	0	0	0	Ο
Other	0	0	0	0	0	0

If you chose 'Other', please specify what other benefits the national data exchange solution must achieve. If you chose "neutral/no opinion", please let this section blank.

What connections must a national data exchange solution establish from the following list? Rank the importance of each item.

	Very Important	Important	Moderately Important	Slightly Important	Not Important	Neutral/No Opinion
Peer-to-peer connections between Canadian post-	0	0	0	0	0	0

secondary institutions						
Connections to other Canadian application centres/data exchange hubs	0	0	0	0	0	0
Connections to other international nodes	0	0	0	0	0	0
Other connections	0	0	0	0	0	0

If you chose 'Other', please provide details. If you chose "neutral/no opinion", please let this section blank.

What document validation functionality must a national data exchange platform provide? Rank the importance of each item.

	Very Important	Important	Moderately Important	Slightly Important	Not Important	Neutral/No Opinion
Incoming Document Validation	0	0	0	0	0	0
Outgoing Document Validation	0	0	0	0	0	0
Other	0	0	0	0	0	0

If you chose 'Other', please specify the other document or data validation needs you would recommend. If you chose "neutral/no opinion", please let this section blank.

Business Requirements - Funding Supports

The following questions are intended to identify the funding options we should consider to support creation and operational sustainment of a national data exchange platform.

Identify your level of agreement with each of the following funding options to support the initial planning, RFP process, and early stage implementation requirements for the national data exchange project.

Early stage funding should rely on....

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
the voluntary financial participation of ARUCC members that are interested.	0	0	0	0	0

an across the board, standardized top up amount to institutional ARUCC membership fees (i.e., all institutions pay the same amount regardless of size).	0	0	0	0	0
an across the board, top up to institutional ARUCC membership fees that is based on a graduated fee according to institutional size.	0	0	0	0	0
an across the board, standardized, top up fee for any associate members.	0	0	0	0	0
Other	0	0	0	0	0

If you chose 'Other', please specify the other funding options you would recommend to support early stage planning and implementation. If you chose "neutral/no opinion", please let this section blank.

Identify your level of agreement with each of the following funding options to support regular, ongoing operations necessary to sustain the national data exchange platform beyond implementation. Operational funding to sustain the national data exchange platform should rely on....

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
the voluntary financial participation of ARUCC members that are interested.	0	0	0	0	0
an across the board, standardized top up amount to institutional ARUCC membership fees (i.e., all institutions pay the same amount regardless of size).	0	0	0	0	0
an across the board, top up to institutional ARUCC membership fees that is based on a graduated fee according to institutional size.	0	0	0	0	0
an across the board, standardized, top up fee for any ARUCC associate members.	0	0	0	0	0
provincial government funding.	0	0	0	0	0
federal government funding.	0	0	0	0	0
cost recovery models (including fees for service).	0	0	0	0	0
Other	0	0	0	0	0

If you chose 'Other', please specify the other funding approach you would recommend to sustain regular, ongoing operations for the national data exchange platform. If you chose "neutral/no opinion", please leave this section blank.

Are there any other broader considerations we must be mindful of when creating a national data exchange platform? If none at this time, move forward in the survey.

Business Requirements - Student Supports

The following questions are intended to identify the student services a national data exchange platform should provide.

Should the national data exchange platform provide student-facing information on its website?

O Yes

O No

don't	know
	don't

Please explain why you believe this is needed.

Should the national data exchange platform provide any online services for students?

O Yes

O No

0	I	don't	knov	v

What services would you suggest?

Should the national data exchange platform provide a student-facing, password protected portal?

0	Yes
0	No
0	I don't know

If you have reasons for suggesting this is needed, please explain.

Business Requirements - Canadian Post-Secondary Institutions, Application Centres, and Data Exchange Hubs

The following questions are intended to identify what the national data exchange platform SHOULD provide to Canadian post-secondary institutions, application centres, and data exchange hubs. The ranking is formatted as follows:

- Mandatory: The proposed national solution must satisfy this.
- Highly Desirable: The proposed national solution should satisfy this.
- Desirable: The proposed national solution could satisfy this, but it's not important.
- Not Desirable: The proposed national solution should not satisfy this.
- I don't know
- Not Applicable

The national platform SHOULD provide the following organizational websites...

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
An organization-facing website	0	0	0	0	0	0
An organization-facing, password protected portal	0	0	0	0	0	0

A national platform must provide the capacity for CANADIAN institutions, application centres and data exchange hubs to...

All answers assume student permission has been provided.

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
Exchange (send and receive) student data in real time	0	0	0	0	0	0
Exchange (send and receive) student data on a regular schedule	0	0	0	0	0	0
Exchange (send and receive) multiple forms of student data (XML, PDF, EDI, etc.)	0	0	0	0	0	0

Maintain, track and manage bulk student data exchange requests	0	0	0	0	0	0
Maintain, track and manage individual student data exchange requests	0	0	0	0	0	0
Manage student data exchange requests from multiple devices.	0	0	0	0	0	0
Verify individual student data	0	0	0	0	0	0
Suppress student data	0	0	0	0	0	0
Choose what student data to send	0	0	0	0	0	0
Choose what student data to receive	0	0	0	0	0	0

Business Requirements - for Canadian Post-Secondary Institutions, Application Centres, and Data Exchange Hubs

The following questions seek to identify other needed capacities for the national data exchange platform.

A national platform must have the capacity to...

For information on APIs, see here. For information on apostilles, see here.

	Mandatory	Highly Desirable	Desirable	Not Desirable	ı don't know	Not Applicable
Provide student data by data type	0	0	0	0	0	0
Provide student data by student record	0	0	0	0	0	0
Provide APIs that work with different student information systems.	0	0	0	0	0	0
Provide capacity to transform/crosswalk data standards (e.g., PDF to XML)	0	0	0	0	0	0
Support a Canadian apostille brand/label to demonstrate authenticity of verified student data.	0	0	0	0	0	0

Support bilingual content and other characters with	0	0	0	0	0	0
associated symbols.						

Business Requirements - For Within Canada

The following questions are intended to identify exchange needs within CANADA.

Indicate with which Canadian allied organizations you would like to exchange electronic student data.

	Exists alread y	Mandator Y	Highly Desirabl e	Desirabl e	Not Desirabl e	ı don't kno w	Not Applicabl e
Application centre in another province/territory	0	0	0	0	0	0	0
Application centre in my province/territory	0	0	0	0	0	0	0
Councils of Articulation/Admissio n and Transfer (e.g., BCCAT, ONCAT, NBCAT, etc.)	0	0	0	0	0	0	0
External credential evaluation services (e.g., WES, IQAS, etc.)	0	0	0	0	0	0	0
Other allied organization	0	0	0	0	0	0	0

If you chose 'Other', specify with which other allied organizations you would like to establish a data exchange relationship. If you chose "Not applicable" or "I don't know", ignore this section.

Indicate with which Canadian educational organizations your organization would like to exchange electronic student data.

	Exists already	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
High schools or high school boards located in another province/territory	0	0	0	0	0	0	0
High schools or high school boards within my province/territory	0	0	0	0	0	0	0

Post-secondary institutions in another province or territory	0	0	0	0	0	0	0
Post-secondary institutions within your province/territory	0	0	0	0	0	0	0
Other educational organization	0	0	0	0	0	0	0

Specify with which other Canadian educational organizations your organization would like to establish a data exchange relationship.

Indicate with which Canadian employment organizations you would like to exchange student data.

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
Employment Recruitment Organizations	0	0	0	0	0	0
Employers	0	0	0	0	0	0
Other employment organizations	0	0	0	0	0	0

Specify with which other employment organizations you would like to establish a data exchange relationship. If you chose "Not applicable" or "I don't know", ignore this section.

Indicate with which Canadian government entities your organization would like to exchange electronic student data.

	Exists already	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
Immigration, Refugees and Citizenship Canada (Canadian federal government)	0	0	0	0	0	0	0
Provincial ministry	0	0	0	0	0	0	0
Other Canadian government entity(ies)	0	0	0	0	0	0	0

Specify with which other government entity(ies) your organizations would like to establish a data exchange relationship. If you chose "Not applicable" or "I don't know", ignore this section.

	Exists already	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
Apprentice/Trades Bodies	0	0	0	0	0	0	0
Professional regulatory bodies (e.g., College of Teachers, Engineers Canada, etc.)	0	0	0	0	0	0	0
Other third parties	0	0	0	0	0	0	0

Indicate with which other entities your organization would like to exchange electronic student data.

Specify with which other entities your organizations would like to establish a data exchange relationship. If you chose "Not applicable" or "I don't know", ignore this section.

Rank the types of student data your organization would most like to exchange with other Canadian organizations through a national platform.

	Very interested	Interested	Slightly interested	Not at all interested	Already exists	l don't know	Not applicable
Admissions data	0	0	0	0	0	0	0
Co-curricular data	0	0	0	0	0	0	0
Credential equivalency evaluation data (e.g., from WES, ICES, IQAS, etc.)	0	0	0	0	0	0	0
Graduation confirmation data	0	0	0	0	0	0	0
Language proficiency test data	0	0	0	0	0	0	0
Post-Secondary Transcript Data	0	0	0	0	0	0	0
Proof of enrolment data	0	0	0	0	0	0	0

Secondary School Transcript Data	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0

If you chose 'Other', provide additional details. If you chose "Not applicable" or "I don't know", ignore this section.

Business Requirements - With International Organizations

The following questions are intended to identify exchange needs with INTERNATIONAL organizations.

All answers assume student permission has been provided.

A national platform must have the capacity to allow Canadian post-secondary institutions, application centres, and data exchange hubs to...

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
Send student data to other INTERNATIONAL organizations.	0	0	0	0	0	0
Receive student data from other INTERNATIONAL organizations.	0	0	0	0	0	0

Please indicate to which three international countries your organization would most like to SEND student data. List them in order of priority with the top priority country listed first.

Please indicate from which three international countries your organization would most like to RECEIVE student data. List them in order of priority with the top priority country listed first.

Indicate with which INTERNATIONAL parties your organization would like to exchange electronic student data.

	Very intereste d	Intereste d	Slightly intereste d	Not at all intereste d	Alread y exists	l don' t kno w	Not applicabl e
International government	0	0	0	0	0	0	0

ministries/departmen ts							
International post- secondary institutions	0	0	0	0	0	0	0
International secondary or secondary school boards	0	0	0	0	0	0	0
Trusted national nodes in other countries or regions involved in student data exchange	0	0	0	0	0	0	0
Other International Organizations	0	0	0	0	0	0	0

If you chose 'Other', identify the organizations or types of organizations with which you would like to establish a data exchange relationship. If you chose "Not applicable" or "I don't know", ignore this section.

Rank the types of student data your organization would most like to exchange with INTERNATIONAL organizations through a national platform.

	Very interested	Moderately interested	Slightly interested	Not at all interested	Already exists	l don't know	Not applicable
Admissions data	0	0	0	0	0	0	0
Co-curricular data	0	0	0	0	0	0	0
Diploma related data	0	0	0	0	0	0	0
Exchange student learner agreements	0	0	0	0	0	0	0
Graduation confirmation data	0	0	0	0	0	0	0
Language proficiency test data	0	0	0	0	0	0	0
Post- Secondary transcript data	0	0	0	0	0	0	0

Proof of enrolment data	0	0	0	0	0	0	0
Secondary transcript data	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0

If you chose 'Other', provide additional information. If you chose "Not applicable" or "I don't know", ignore this section.

Business Requirements - Vendors

The following questions are intended to identify what requirements a potential vendor of a national data exchange platform should meet.

The vendor for the national data exchange platform must provide...

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
A 'Made-in-Canada' solution with data hosting environments located within Canada	0	0	0	0	0	0
English and French translation of all messaging (with the original student data remaining in the language provided).	0	0	0	0	0	0
Full project management support with associated programmers, system architects, network server expertise, and data exchange experts.	0	0	0	0	0	0
An implementation project plan	0	0	0	0	0	0
A prioritized implementation schedule.	0	0	0	0	0	0
Evidence of adherence to provincial, federal and European (i.e., GDPR) privacy and consent of use regulations.	0	0	0	0	0	0

The vendor for the national solution in Canada must be prepared to provide...

	Mandatory	Highly Desirable	Desirable	Not Desirable	l don't know	Not Applicable
On-boarding supports for each recognized post- secondary institution not currently served by a provincial application centre or data exchange hub.	0	0	0	0	0	0
On-boarding support, training, and communication to recognized post-secondary institutions even if they are currently supported by a regional or provincial application centre.	0	Ο	0	Ο	0	0
On-boarding support, training, and communication to existing provincial application centres or data exchange hubs.	0	0	0	0	0	0

Are there any other supports you would recommend the vendor provide to post-secondary institutions or application centres?

You've reached the end of the survey!

Your time and participation are much appreciated.

Please use the field below to offer any additional thoughts or comments you have that we should keep in mind as we continue to develop a national data exchange solution.

Exhibit B - Interview Guide

Advancing Student Mobility through Data Mobility – An Ontario Focus

Project Overview: This Project is being led by the Association of Registrars of the Universities and Colleges of Canada (ARUCC) in partnership with the Ontario University Registrars' Association (OURA) and the Ontario College Committee of Registrars, Admissions and Liaison Officers (CRALO) with funding provided by the Ontario Council on Articulation and Transfer (BCCAT). Joanne Duklas is the primary investigator and project consulting lead. Its scope includes indexing the current state of electronic data exchange capacities related to exchange student data to advance mobility and the readiness for change across institutions and allied organizations in Ontario. The Project also seeks to capture expert advice at the local and system levels regarding the changes and supports necessary to implement a national data exchange solution to advance student mobility.

The research aligns with and informs two other similar projects: the BCCAT Data Exchange Project which replicates the Ontario Project and the ARUCC Groningen and Student Mobility project. The latter initiative seeks to create an innovative, trusted, national student data exchange network to facilitate transfer and mobility. These three aligned projects serve broader student mobility goals such as those embedded in the MOU between the provincial councils of admissions/articulation and transfer. Internationally, the projects align with the Lisbon Recognition Convention and the Groningen Declaration Network Organization, each of which seeks to improve student mobility.

<u>Research Team:</u> Joanne Duklas, the primary investigator, will lead the interviews with support provided by Matt Schultz, a research assistant at Duklas Cornerstone Consulting.

Interview Guide Overview: This interview guide provides an overview of the Project and the interview questions. Each interview is anticipated to take 1.5 hours and will be conducted via web conferencing. You are welcome to include expert members of your staff from across your organization with knowledge of electronic student data exchange capacities and processes and supporting IT systems.

Overall Research Approach: The research approach involves conducting a review of scholarly and trade literature and websites focused on electronic data exchange, consulting with data exchange service providers, and identifying data exchange standards and implementation needs. Interviews with select institutions, councils on articulation/admissions and transfer, data hubs and other organizations as identified through the research process, will be held to gain a detailed understanding of the current state at various local levels, capture advice, and identify any gaps impacting student data exchange.

Additionally, the results from a national survey of Canadian post-secondary institutions and allied organizations distributed in summer 2018 will provide further insights. The researchers ask that <u>the</u> <u>national survey be completed prior to the interview</u>. Each organization's results from the survey will be shared in advance of the interview to help inform the discussions.

Final Report: The final report will be submitted to ONCAT with a publication goal of Spring 2019. It will contain the research findings, identify the current state for data exchange, and highlight any issues, innovative or efficient processes, and promising practices. The report will also contain suggestions for further research. Finally, the findings will inform the three projects mentioned above: the BCCAT Data Exchange Project, the ONCAT Groningen Project, and the ARUCC Groningen and Student Mobility Project.

Please note:

All information gleaned from the surveys, interviews and meetings will be anonymized in the final research publications and all identifying information of participants will be kept confidential.

Primary Investigator: Joanne Duklas, Researcher and Consultant, Duklas Cornerstone Consulting Support: Matt Schultz, Research Assistant, Duklas Cornerstone Consulting

Questions regarding this research study should be directed to Joanne Duklas (joanne@duklascornerstone.ca).

Groningen Interview Questions for Institutions

- 1. Current State
 - a. Given the scope of the project, is there anything regarding your institution's context about which we should be aware?
 - b. How does your institution handle, exchange and, if applicable, store electronic student data?
 - Is the process the same for domestic (within-Canada) and international students? (Examples student biographical or academic information, transfer credit, exchange credit, course information, etc.)
 - What data exchange is occurring currently (and with which organizations)? Are there any plans to connect with other provinces/territories or with trusted data sources outside of Canada?
 - c. Are there any challenges or complexities either at your institution or within your jurisdiction that will impact national student data exchange?
 - What about for data exchange related to transfer or student mobility?
 - How are you addressing these (if applicable)?
- 2. Business Needs:
 - a. Assuming this was possible, with which top organizations would you like to establish a student data trading relationship?
 - b. What student data or documents does your institution need to exchange with other institutions or organizations?
 - c. Are there particular challenges or gaps you would like to see resolved through enhanced student data exchange at the institutional, provincial, national, and/or international level?
 - What about with respect to student transfer and mobility?
 - d. What benefits would you like to see result from participating in a national data exchange network?
 - What value-add services should be provided as part of a national data exchange network?
 - Should a student facing component be included as part of a national data exchange model?
- 3. Recommendations:

- a. What preparation must happen at your institution or within your jurisdiction to advance data exchange that supports student transfer and mobility (e.g., capacity improvements, onboarding, and change readiness)?
 - What recommendations do you have for the Project to support these needs?
 - Are there any specific recommendations you have related to improving data exchange relevant to student transfer and mobility?
- b. How do you manage and govern data exchange agreements and adherence to privacy regulations? What advice do you have for us in this area as we move forward with the national data exchange project?
- c. Do you know of any best-in-class examples we should look at more closely?
- 4. Do you have any other comments you would like to share to help us as we move forward with this Project?

Exhibit C – Student Overview



Data Exchange and Student Mobility Project

Partners: Ontario College Committee of Registrars, Admissions and Liaison Officers (CRALO); Ontario University Registrars' Association (OURA) **Funding Partner:** Ontario Council on Admissions and Transfer (ONCAT)

Student Feedback Session

Purpose

The purpose of this session is to explore students' perceptions and experiences on transfer and to identify any issues or suggestions they may have regarding improving the exchange of student or course data between institutions, or between institutions and other third parties (e.g., employers, ITA, etc.) to enhance student transfer and mobility.

The student roundtable discussion is intended to support research for three projects: an ONCAT funded project called 'Advancing Student Mobility through Data Mobility – An Ontario Focus, a similar data exchange project funded and focused on British Columbia, and the ARUCC Groningen and Student Mobility Project, a national student data exchange initiative. Each of these is informing creation of a national student data exchange network to support secure, permission-based, student data sharing between institutions and between institutions and other third parties (e.g., government, application centres, regulatory bodies, employers). The ONCAT funded project, like the BCCAT funded project, is focused on enhancing understanding of the current data exchange environment in Ontario particularly as it relates to student transfer.

Responses to the questions asked will be captured by a project note taker. These notes will be used to inform a thematic understanding of the issues and recommendations. Responses will be kept confidential and only used to inform the research for the above projects. The final reports will summarize the thematic findings from the research and be published on the BCCAT, ONCAT, and ARUCC websites.

More project details are available online at http://arucc.ca/en/resources/task-force-groningen.html

Primary Investigator & Contact for Questions

Joanne Duklas, Duklas Cornerstone Consulting; joanne@duklascornerstone.ca

Roundtable Discussion Agenda

- 1. Introductions
- 2. Overview of Projects
- 3. Roundtable Discussion
- 4. Next Steps

Recommended Student Participants

• Students who have transferred into (or are considering transferring out of) the institution

- Student who are graduating and transitioning into the workforce
- Internationally educated students
- Students who have applied or are contemplating applying to an institution outside the province

Questions to be explored

- 1. What was your experience with submitting documents when transferring into any of the institutions you have or are attending?
- 2. What worked well during this process?
- 3. What did not work well?
- 4. What would you change, if you could?
- 5. Do you have any other thoughts or recommendations we should keep in mind?

Exhibit D – Regional Meeting Material

Greetings,

On behalf of the Association of Registrars of the Universities and Colleges of Canada (ARUCC), we are cordially inviting you and others from your institution to a regional meeting to discuss the creation of a national student data exchange network. ONCAT has funded this portion of the project so that we can capture business requirements and advice for the national project. Session details are noted below.

Date:	November 29	
Time:	2 to 4:30pm	
Location: Rosser Boardroom, WC5		
	5 th Floor, Building C	
	Algonquin College	
	1385 Woodroffe Avenue	
	Ottawa, Ontario K2G 1V8	

Agenda: Attached

Please register in advance at the following site by November 22: <u>https://form.simplesurvey.com/f/l/OttawaRegionalMeeting</u>

Those with admissions, registrarial, transfer, and data exchange/systems expertise are encouraged to participate. The session will be led by Joanne Duklas, Duklas Cornerstone Consulting, who serves as the primary investigator for this project, and Romesh Vadivel, ARUCC president and member of the Project Steering Committee.

Project Background:

Regional meetings are being held in different parts of the province. Feedback gathered will be used for the ARUCC Groningen project funded by ONCAT which seeks to identify the current state of electronic data exchange capacities and business requirements needed to create a national student data exchange network. The findings will also be used to inform two other projects: the national ARUCC Project, which seeks to create a national student data exchange network to facilitate transfer and mobility, and a similar study in British Columbia funded by the BC Council on Admissions and Transfer (BCCAT). More details regarding the various projects are published online at the following web sites:

National Project: http://arucc.ca/en/resources/task-force-groningen.html

ONCAT and BCCAT Funded Projects: http://arucc.ca/en/oncat-bccat-projects.html

Project Support:

Gratitude is extended to Krista Pearson, Registrar at Algonquin College, and Tracy Al-Drissi, Registrar at Trent University. They are representing CRALO and OURA for this project.

Please do not hesitate to contact me with any questions you may have regarding this meeting or the projects.

Thanks for your time. Sincerely, Joanne Duklas

Handout attached in email: Agenda Parking Information


ARUCC Data Exchange Project – An Ontario Focus

Ontario Regional Meeting: for institutions located in areas around Ottawa and surrounding communities

Date: November 29, 2018 Time: 2 to 4:30pm

Location: Rosser Boardroom, WC539 5th Floor, Building C Algonquin College 1385 Woodroffe Avenue Ottawa, Ontario K2G 1V8

Objectives of Meeting

- Identifying the current state and readiness for exchanging electronic student data
- Identifying strengths and gaps for data exchange capacities and related student services
- (iii) Identifying future business needs related to data exchange

Agenda

- 1. Welcome, Territory Acknowledgement, and Introductions
- 2. Project Overview
- 3. Discussion of Current State
 - What is your institution's current state for data exchange services and IT infrastructure?
 - What's on your institution's horizon in terms of student services and data exchange?
- 4. Break
- 5. Identification of Strengths and Gaps
 - Institutionally
 - Provincially
 - Nationally
- 6. Moving Forward
 - What is required at your institution and provincially to advance individual student data exchange?
 - How might students and institutions benefit from participation in a national data exchange network?
 - o What risks should we be aware of as we move forward with the national project?
- 7. Closing Remarks and Next Steps