CANARIE ANNUAL REPORT

for
Innovation, Science and Economic Development (ISED)
Canada

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Table of Contents

1.0 Overview

Context for CANARIE
CANARIE's role in Canada's innovation ecosystem was set out in its 1993 Articles of Incorporation, and reiterated in its 2013 Articles of Continuance: *to contribute to Canadian competitiveness in all sectors of the economy, to wealth and job creation and to the quality of life of Canadians.*

Throughout its history, CANARIE has evolved to support Canadian competitiveness through the development and deployment of digital technology for Canada's research, education and innovation communities. Over the course of its 27-year history, CANARIE has helped shape Canada's digital landscape by leading the following initiatives, among many others:

- laying the groundwork, with provincial partner networks, for the first commercial Internet in Canada;
- incubating the Internet Registration Authority in Canada, now known as CIRA;
- supporting hundreds of Canadian businesses, educational and health organizations in their transition to digital models and processes via the Technology Development, Technology Diffusion Program; Technology Applications Development Program; and E-business, E-learning and E-health Programs;
- identifying gaps in research software and championing the development of powerful research software tools to accelerate discovery;
- supporting Research Data Canada to align research data activities within Canada and internationally;
- working with global peers to align international research and education infrastructures to support globally collaborative research; and
- developing the grid certificate authority in Canada that provides secure access to data generated from the Large Hadron Collider and other advanced digital technologies.

CANARIE's activities serve to continually advance Canada's digital infrastructure for research, education and innovation so that Canadians are positioned to compete in the global knowledge economy. More detailed information on current activities may be found below.

Executive Summary
CANARIE's Contribution Agreement for 2015-2020 with Innovation, Science and Economic Development (ISED) Canada requires the organization to "provide to the Minister, by July 31 of each Fiscal Year, beginning in 2016, an Annual Report approved by the Board, in both official languages relating to the previous Fiscal Year." This report addresses those requirements.

Over the past year, CANARIE has executed on all eligible activities outlined in its 2019-20 Business Plan. These eligible activities align with CANARIE's core purpose: **the advancement of Canada's knowledge and innovation infrastructure,** and its mission: **to design and deliver digital infrastructure, and drive its adoption for research, education and innovation**. At a high level, through its programs, CANARIE works towards achieving these objectives by:

- overseeing the ongoing evolution of Canada's National Research and Education Network (NREN);
- championing the development of research software, research data management, and collaboration tools; and

- providing users in the private sector with access to advanced technologies to accelerate their time to market.

Together, these activities align to deliver more integrated and accessible digital research infrastructure, tools and services. Beyond these activities, CANARIE also champions the evolution of Canada's digital research infrastructure, which is a critical lever driving social and economic gains that benefit all Canadians.

Network Evolution
As the primary role of the CANARIE network is to provide interprovincial and international connectivity for Canada's National Research and Education Network (NREN), CANARIE works closely with provincial and territorial network partners that build and operate regional networks in their province or territory to co-deliver services to the Canadian research and education community. Through a governance structure which is led by the NREN Governance Committee, this successful federal/provincial partnership manages the evolution of the NREN as a whole to ensure that Canada's research, education and innovation communities can access nationally and globally distributed data, tools and colleagues.

CANARIE understands the impact of increasing amounts of digital data on research, education, and innovation, and has evolved the national backbone network to ensure Canada's research and education community can continue to access and leverage these data to support world-class research. Data traffic grew approximately 26% from FY19 to FY20.

Given the foundational nature of the network to a wide range of research, education, and innovation activities, CANARIE focuses on both its core network and the ongoing strategic evolution of Canada's NREN. Of particular note is the on-going execution of the NREN Strategic Plan, the first such plan created, and a significant milestone in the strong federal-provincial partnership that is the cornerstone of Canada's NREN.

CANARIE continues to represent Canada in the international advanced networking community, participating actively in the NREN CEO Forum and the Global R&E Network Advancement Group (GNA-G). CANARIE's participation in these and other communities ensures that Canada's digital research infrastructure evolves to enable Canada's research and education communities to participate and lead globally collaborative research.

CANARIE supports mission-critical research at a range of government laboratories. As well, a CANARIE representative sits on Shared Services Canada (SSC)'s IT Infrastructure Roundtable to provide unbiased information and expertise to assist SSC in network and network-based services planning and execution. CANARIE is increasingly called upon to provide objective advice to government partners regarding new technology initiatives and opportunities for Canada.

Collaboration Tools
Under the Canadian Access Federation (CAF) service umbrella, CANARIE enables Canadian students, staff and faculty to securely access remote resources using only their username and password from their home institutions. This service enables seamless access to protected online content, and to campus Wi-Fi networks through *eduroam*. CANARIE continues to see significant growth in the use of these services and to evolve the technical and administrative infrastructures to support Canada's increasingly mobile cohort of staff, students and faculty.

Use of the *eduroam* service continues to grow rapidly; the 276 million inter-institutional sign-ons to the service in 2018-19 increased to 308.8 million in 2019-20, an increase of 12%.

Research Software
Recognizing that software is essential infrastructure to support access to data and its computation, CANARIE has invested in research software tools since 2007. CANARIE's long-term vision is to enable software reuse and software development best practices within Canada's research community. Through its Research Software Program, CANARIE has spearheaded the development of 141 reusable software tools, and is now supporting the onboarding of new researchers onto existing research software tools. In order to maximize the impact of these investments, these software tools are available to all researchers.

CANARIE's most recent funding calls have supported the modification and maintenance of existing research software platforms to meet the needs of new research teams.

Members of CANARIE's Research Advisory Committee and Software Technology Advisory Committee, which have representation that includes the private sector, ensure CANARIE's investments in software are directed towards the most useful software tools, and that these tools employ good software design.

Research Data Management
Since 2014, CANARIE has been providing funding for Research Data Canada (RDC) and its programs, enabling opportunities for greater integration of the elements of digital research infrastructure. RDC's Executive Director works with stakeholders to develop the policy frameworks that enable reuse of research data resources. This initiative not only represents an opportunity to address a gap in Canada's digital research infrastructure, but also leverages and informs CANARIE's Research Software, Canadian Access Federation, and DAIR programs.

Most recently, CANARIE launched a Research Data Management program to fund the development of national data management tools and software. The program has funded 9 research teams to date to develop software components and tools to enable Canadian researchers to adopt best practices in managing data resulting from scientific research.

Private Sector Innovation
CANARIE enables users in the private sector to leverage its digital infrastructure to accelerate the commercialization process. The Digital Accelerator for Innovation and Research (DAIR) Program has supported almost 1,400 small and medium-sized enterprises (SMEs) to test and develop a range of novel Information and Communications Technology (ICT) products and services. The DAIR Program provides SMEs with an opportunity to benefit from the scale and agility of cloud resources (computing and storage resources that are located in distributed data centres). Deploying these advanced technologies provides businesses with an opportunity to test and develop innovative products at no cost, which both speeds time to market and reduces development costs. Further, the opportunity to deploy cloud technologies in early product development is a powerful demonstration of how these technologies can transform traditional business models, and serves to further incent businesses in adopting cloud technologies as part of their long-term business strategy.

Through partnerships with other organizations such as the Fundica Funding Roadshow, CANARIE continues to promote the use of DAIR and the transformative power of cloud technologies. A range of case studies, published on the CANARIE website, highlight these

businesses' use of DAIR and the tangible competitive value delivered through the use of cloud infrastructures to the SME community.

To advance Canada's leadership in networking technology, CANARIE is a founding partner in the Centre of Excellence in Next Generation Networks (CENGN). CENGN is a consortium of industry, academic, and research leaders who are pooling their expertise and equipment to enable SMEs to test new products at scale, with the goal of accelerating the commercialization of Canadian networking technologies in the global marketplace. CANARIE continues to provide the critical network infrastructure and connections to stakeholders in the private and public sectors that underpin CENGN.

Partnerships and Community Engagement
CANARIE continues to engage with a broad range of stakeholders to ensure its activities align with changing community needs, including the New Digital Research Infrastructure Organization (NDRIO), the CFI, Compute Canada, Universities Canada, the U15, CUCCIO, CAUBO, Colleges and Institutes Canada, Genome Canada, and the granting councils. CANARIE is working extensively with NDRIO and the broader community to ensure the smooth transition of Research Software and Research Data Management Activities to NDRIO by the end of FY22.

CANARIE's role in the digital research infrastructure landscape continues to solidify through premier events such as the CANARIE National Summit, speaking opportunities for CANARIE staff at provincial, national and international events and conferences, through ongoing updates to its corporate website and social media platforms, and with outreach/educational materials.

On behalf of the Board of Directors, CANARIE would like to thank the Minister and officials at Innovation, Science and Economic Development Canada, for their continued support and confidence in CANARIE. CANARIE looks forward to providing Canada's research, education, and innovation communities in the public and private sectors with world-class digital research infrastructure, so that Canada can grow its innovation capacity and compete and win in the global digital economy.

2.0 Statement of Eligible Activities for 2019-20 and Report on the Extent to Which CANARIE Met the Expected Results

The overarching goal for CANARIE activities during its 2015 – 2020 mandate period is to strengthen Canada's digital research infrastructure. CANARIE's activities in the final year of this mandate aligned to this goal, and contributed to a greater integration and accessibility of digital research infrastructure, tools, and services.

CANARIE's three eligible activities in the 2019-20 Business Plan are detailed below. A report on the extent to which each eligible activity was achieved is contained in the paragraphs following.

1. Network Operations

Evolve/extend Canada's world-leading collaboration network
In order to address the evolving needs of users in research, education and innovation communities, CANARIE will enable a pan-Canadian collaboration capability through a world-leading high performance network and network-based services.

CANARIE Network:

Overview of the Network Evolution Strategy
To evolve and expand the CANARIE network in a flexible and cost-effective manner over the long-term, CANARIE's vision is to deploy fibre, where economical, from coast-to-coast across Canada. In high-use, high-growth network corridors, CANARIE has purchased long term use of fibre and therefore has the flexibility to add capacity and deploy transformative technologies at a considerably lower incremental cost. To further build out the network, CANARIE uses leased services from suppliers where the traffic demand does not warrant dedicated fibre, for service resiliency, or when fibre acquisition is cost prohibitive.

The top five CANARIE network users in 2019-20 were: Simon Fraser University, TRIUMF, SHARCNET, Westgrid, and the University of British Columbia

Deployment of additional network capacity to meet the growing traffic need
CANARIE added an additional 100G of connectivity along the southern path of its core network, from Montreal to Seattle. CANARIE is also in the process of working with ORION (Ontario) to add additional 100G connectivity between Winnipeg and Toronto. In addition to this capacity upgrade, CANARIE upgraded its routing equipment to support the continual traffic growth.

Deployment of additional network capacity to support Northern connectivity
CANARIE continues to evaluate options to improve connectivity to Canada's north. In March 2020, CANARIE contracted to increase the capacity of the Yukon connection from 100Mbps to 300Mbps, a 3 fold increase. The enhanced service will be delivered in early FY21. For connectivity within the Northwest Territories, CANARIE is engaging with Aurora College to support the evolution of the regional network.

Improved core node reliability
CANARIE continues to improve core node reliability. In 2019-20, additional sites were added in Vancouver and Montreal, to improve redundancy in the network.

Improvement of network security monitoring and measurement system

CANARIE deployed a Security Information and Event Management (SIEM) tool on the core network to improve threat monitoring capability. This deployment was part of the first ever national procurement for the NREN, and saw the same tool deployed across twelve partners in the Canadian NREN. In addition CANARIE also deployed a monitoring system on the core network to improve the detection of Distributed Denial-of-Service (DDoS) attacks.

Deployment of the Software Networking Pilot

CANARIE continues to collaborate with its Advanced North Atlantic (ANA) partners to expand the software networking pilot to include other international NRENs and advanced networking research groups. The pilot gave project partners practical experience in managing large scale infrastructure and delivering network services using software orchestration and automation techniques. The pilot will eventually turn into a production service providing researchers seamless software-based controlled access to network services.

Deployment of support tools accessible through the user portal

CANARIE continues to enhance its network support tool set to more effectively manage the network. CANARIE began by developing a framework to simplify data collection and building a network traffic map. The user portal enables access to reports and traffic data. Access to the portal is currently being planned to permit external users to access similar reports and data for their region.

Successful launch, and execution of a Call for Participation for phase two of the Joint Security Project

CANARIE launched phase 2 of the Joint Security Project, which enabled 137 institutions to deploy intrusion detection systems on their networks, to share information collected with one another, and to access security analysis tools. The security insights provided by the tools are strengthened because of participants' information sharing, as this provides a more comprehensive view of threats being faced by participating institutions. CANARIE ran two workshops at the start of phase 2, in order to provide training to participants, and to help develop a community within the group. Response to the workshops were extremely positive, with the overall average experience rating of 89%.

Continue to support connections to government research facilities that meet the performance needs of the government science community

CANARIE continues to work with Shared Services Canada (SSC) on building the Government of Canada Science Network (GCSN). SSC plans to complete the migration of all connected federal laboratories by the end of 2020-21.

Other Achievements – Network:

Cybersecurity Initiatives Program Outreach

CANARIE is working with the community to develop a national approach for cybersecurity in higher education. This work will drive the evolution of our Cybersecurity Initiatives Program, which will launch activities in the 2020-2024 mandate.

International Partnerships – NREN CEO Forum

CANARIE continues to participate as a member of the Global NREN CEO Forum. This forum brings together the CEOs of 17 national research and education networks to collaborate on the global evolution of critical digital infrastructures and associated services. The forum provides an

opportunity for Canadian representation on a broad range of global research and education initiatives that include networking evolution, shared marketing collateral, and identity management.

International Partnerships – Global Network Advancement Group (GNA-G)
CANARIE was actively involved in the Global Network Architecture (GNA) initiative with the goal of defining a reference architecture and creating a roadmap for both national and regional research and education networks to more seamlessly support research. This group has evolved into the Global Network Advancement Group (GNA-G), to provide a broader effort that will establish more capable, predictable, cost-effective, and resilient next-generation global connectivity for research and education. CANARIE's CEO serves as the Executive Liaison between the GNA-G leads and CEOs of R&E networks globally.

NREN Program:

Canada's National Research and Education Network (NREN) operates on a co-delivery model, as a partnership between CANARIE and provincial/territorial Regional Advanced Networks (RANs). CANARIE provides interprovincial and international connectivity, while the RANs provide connections to institutions within their jurisdictions. RAN data that travels out of a province or territory traverses CANARIE network links to RANs in other provinces or territories, or internationally via CANARIE links connecting Canada to the rest of the world.

A coherent technical and strategic evolution of the NREN as a whole is driven by a vision to ensure that Canadians from coast to coast to coast have a comparable user experience within Canada, and to users of NRENs in other countries. CANARIE's NREN Program provides funding for RANs to increase the capacity and reliability of existing equipment and infrastructure; to enable network management (tools and training); and to extend the reach of RAN networks to more institutions.

Execution of the NREN SIEM Deployment Project
Twelve partners in the NREN participated in the NREN SIEM Deployment, which saw a national joint procurement of a Security Information and Event Management (SIEM) tool at NREN partners. The Project also incorporated the hiring of dedicated SIEM analysts at NREN partners, thereby creating a community of security practitioners across the country.

Execution of projects funded under Call 3
CANARIE funded nine projects under Call 3. All projects have been completed successfully.

Technical and financial audits of projects funded under Calls 1, 2 and 3
Audits were completed for 13 of the 15 projects that were selected for audit; completion of the final two (for Call 3 projects) has been delayed as a result of the pandemic, and they will be scheduled as soon as possible

Increased reliability and capacity on network segments shared by RANs
CANARIE began work with ORION (Ontario) to provide additional 100G Connectivity between Winnipeg and Toronto.

Strategic alignment of NREN partners on the evolution of the NREN and the development and launch of projects to enhance security
CANARIE continues to collaborate with provincial and territorial network partners to evolve Canada's National Research and Education Network (NREN). The strategic plan focuses on

NREN Services, Organization and Relationships, and how the NREN can improve and expand in these areas to deliver maximum value to Canada's research and education community. It is important to note that this is the first strategic plan ever developed for the NREN, and is a testament to the commitment of the members of the NREN Governance Committee (NREN GC), who come from 13 organizations with different mandates, governance structures, and funding models. The strategic objectives identified for completion in the 2015 – 2020 mandate have been achieved.

The partners are committed to the execution of the elements of the strategic plan and to devoting the necessary resources to continue to strengthen the NREN. The NREN GC is now working together on updating the strategic plan for the NREN for the 2020 – 2024 mandate.

Other Achievements – NREN

Nunavut RAN
CANARIE has been working with Nunavut Arctic College and other interested parties in Nunavut, with the objective of creating a RAN in Nunavut. In the fall of 2019 CANARIE signed a Letter of Understanding with Nunavut Arctic College wherein both parties agreed to collaborate on the creation of a Nunavut Regional Advanced Network (RAN). The Nunavut RAN is being established for the purpose of developing and operating digital infrastructure and services to support the advancement of research and education activities in Nunavut.

NREN Assembly
CANARIE facilitated the second NREN Assembly in Montreal in August 2019, bringing together staff from across the NREN. The event provided an opportunity for NREN staff to learn more about what is taking place across the entirety of the Canadian NREN, to meet NREN colleagues face to face, and to develop operational priorities for the coming year. Additionally, this year's Assembly included a presentation from one of the co-chairs of the GNA-G, in order to build a better understanding of the role the Canadian NREN plays in the global R&E networking ecosystem.

Network Services - Canadian Access Federation:

Overview of Strategy for Network Services
CANARIE works with stakeholder groups to identify demand for network services and collaborates with national and global partners to deliver them. Currently, CANARIE is the national operator of the Canadian Access Federation (CAF), which enables Canadian students, staff and faculty to access protected online content using their existing institutional credentials (i.e. home username and password) through its Federated Identity Management (FIM) service. Institutions participating in CAF also benefit from the *eduroam* service, which provides students, staff and faculty with secure access to the Wi-Fi network on the campus they are visiting, by using their home institution's credentials.

The first week back at school in September 2019 saw nearly 7.3M inter-institutional logins to eduroam, an increase of 1M from the previous year

Increased adoption of CAF services
In 2019-20, participation in the Canadian Access Federation increased from 167 to 188 organizations. Participants continue to benefit from the *eduroam* service: more than half a million users were able to seamlessly log on to campus Wi-Fi networks in Canada and around

the world using their home institution's credentials. In 2019-20, CANARIE supported over 308.8 million *eduroam* inter-institutional logins.

Increase awareness and adoption

As identity management is crucial to security and asset management in a connected world, CANARIE continues to present the benefits of CAF at events and via webinars. In 2019-20, we were invited to present at provincial, national and international post-secondary community IT events. We also hosted webinars for our CAF community regarding the new *eduroam* Visitor Access (eVA) service that we launched, as well as to outline some *eduroam* cybersecurity best practices.

Increase ease of service deployment, operation, and use

In 2019-20, CANARIE undertook an operational improvements initiative to enhance the application and amendment processes for CAF Participants. The aim of this initiative was to improve the contact management related to CAF participants, as well as to simplify the administrative onboarding for CAF Participants. The initiative led to enhancements that included revised online forms and optimized internal processes to allow for a faster response to applications and increased clarity in the process to users.

Expand identity services

Following a successful pilot at four institutions, in 2019-20 CANARIE launched *eduroam* Visitor access (eVa), which allows institutions to easily provide secure, temporary Wi-Fi access to their visitors by allowing unrestricted, time limited access to the campus's Wi-Fi network through *eduroam*. By removing the need to manually create guest accounts, eVa significantly simplifies IT operations for institutions. The service comes at no additional cost to institutions who are already participants in the Canadian Access Federation.

2. Technology Innovation:

Research Software Program:

Overview of Strategy For The Research Software Program
In order to address gaps in research infrastructure and leverage existing investments in research software, CANARIE will support the creation of technologies to bring new collaboration capabilities, not previously offered, to the research community. The Research Software program currently focuses on three principles: funding software re-use and adaptation, to minimise development efforts; promoting research software best practices; and supporting long-term software sustainability.

Maintain visits to science.canarie.ca consistent with FY19 levels

CANARIE continues to maintain and promote the software portal at science.canarie.ca in order to encourage the reuse of existing research software tools. There were 59,034 visits to the portal in 2019-20, compared to 34,828 in 2018-19.

Develop metrics and best practices for the Local Support Initiative

CANARIE launched a Local Research Software Support pilot in 2018, following a model successfully deployed in Europe, to provide software development and support activities to all researchers on campus at institutions. Three institutions participated in the pilot, and working with the participants, CANARIE has development metrics and best practices that will be used for the participants in the first Call for additional participants.

Develop metrics and best practices for the Reusable Platform Initiative

In 2018, CANARIE began work on a reusable platform initiative, to help researchers who had no software project management experience and whose needs in research software were focused on data management rather than high performance computing, such as researchers in the humanities and soft sciences. After an evaluation process, HUBzero was selected for the pilot, and two research teams were recruited to trial the platform with support from CANARIE's in house team. As the reusable platform projects are very similar to other platform projects funded by CANARIE, the same metrics apply. Best practices developed during this initiative have been documented and communicated to the three teams involved in the Local Support Initiative pilot, so that this technology is now available to researchers at their institutions.

Execution of the development and maintenance portions of projects funded under Call 2a and 2b

Research Software Calls 2a and 2b were launched in 2016 and 2018 respectively, to support the adaption to existing platforms to new users. CANARIE continues to monitor the maintenance activities of the projects funded under Calls 2a and 2b.

Financial audits of funded projects

No projects were audited in FY20.

Other achievements – Research Software

Launch of Research Software Call 3

Thanks to the Government of Canada's 2019 decision to refund CANARIE for 2020-2024, CANARIE launched Research Software Call 3 to support research teams who will adapt existing research platforms for re-use by new research teams. This Call will be funded from CANARIE's 2020 – 2024 mandate.

Launch of Local Research Software Support Call

Also as a result of the Government of Canada's 2019 decision to refund CANARIE for 2020 – 2024, CANARIE was able to launch a Call for Participation for Local Research Software Support in January 2020. Based on a successful pilot, the Call provides up to $3.6 million in funding from CANARIE's 2020 – 2024 mandate for up to six institutions to provide dedicated staff on campus to support researchers in using and adapting existing reusable software tools.

Research Software Outreach

CANARIE hosted the second Canadian Research Software Conference in May 2019 to bring together the research software community in Canada. Internationally, CANARIE participated as a member of the steering committee for the newly formed Research Software Alliance (ReSA) and in Research Software Leadership meetings.

Research Data Management:

Overview of Strategy for Research Data Management

In response to consistent community feedback that identified the need to coordinate activities in research data management, CANARIE took action and provided funding to support Research Data Canada in 2014. RDC's overarching goal is to improve the management of research data in Canada so that it is broadly available to support knowledge creation and innovation. CANARIE was given the mandate to support RDC in its 2015 Contribution Agreement, and an Executive Director was hired in 2016.

Members of the community presented the need for the development of software tools to bridge gaps in the Research Data Management ecosystem. As a result, CANARIE launched a Research Data Management (RDM) program in 2017-18. The program used a two-step approach: a community consultation to identify priority areas for tool development, followed by a planned call for proposals to develop the highest priority tools.

Execution underway for all approved projects of the Research Data Management competitive call
Execution is underway for all of the projects funded under Call 1.

Development of an action plan for Canada's National Data Services Framework
The 3rd NDSF Summit took place in February 2020, and plans are underway for the 4th edition of the Summit, to take place in February/March 2021. The outputs of the 2020 Summit included recommendations for next steps, and a workplan for the next Summit, all of which reflect feedback from the NDSF 2020 participants and the broader Canadian stakeholder community. In tandem with the Summit, RDC worked to collect community feedback for an update of the Kanata Declaration[1], a stakeholder statement developed at the 2019 NDSF Summit.

Host data management workshops with the heads of research in the university and college communities
Initial all-day workshops with university Vice Presidents Research, and college Heads of Research, have been held, and plans are underway to host new events in 2021.

Financial audits of funded projects
No projects were audited in FY20.

Development and use of RDM services, tools and platforms that enable Canadians to adopt RDM practices and comply with evolving funder policy
CANARIE provided $2M in funding to support the Canadian Association of Research Libraries' (CARL) Portage Network. The Portage network is a national, library-based RDM network that fosters initiatives to build capacity and coordinate activities in research data management.

Development of end-of-project metrics that demonstrate the impact of targeted funding to the RDM community
CANARIE worked with CARL to develop metrics in relation to the above funding.

Other achievements – Research Data Management

Launch of Research Data Management Call 2
As the Government of Canada decided to fund CANARIE for a 2020 – 2024 mandate in 2019, CANARIE was able to launch Research Data Management Call 2 in late 2019. This funding call supports collaborative interoperability, and integration of data repositories and systems within Canadian and global digital research infrastructures. This Call will be funded from CANARIE's 2020 – 2024 mandate.

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[1] Available at https://zenodo.org/record/3234815#.XPke5YhKiUk

3. Private Sector Innovation

CANARIE seeks opportunities to leverage digital infrastructure and tools to maximize the use of transformative technologies and drive increased innovation and commercialization. CANARIE currently participates in two major initiatives to support ICT sector innovation and commercialization.

DAIR Program:

Overview of Strategy For DAIR
In order to leverage CANARIE resources to stimulate commercialization, CANARIE delivers a cloud-based program, the Digital Accelerator for Innovation and Research (DAIR), that enables advanced ICT research and provides an opportunity for entrepreneurs to accelerate time-to-market. DAIR offers powerful cloud computing resources to small and medium-sized enterprises (SMEs) to accelerate their product development timelines and enable faster time to market. DAIR exposes users to the power of cloud technologies to transform traditional business models and provides these businesses with an opportunity to adopt these technologies as part of their long-term growth strategy.

Continued increase in the total number of DAIR users to beyond 1300 by the end of FY20, based on the FY19 projection of 1211
The aggregate number of DAIR users as of April 1, 2020 was 1390 which is up from 1232 from the prior year. This new target is higher than the original expected outcome specified at the beginning of the mandate for FY20 of 1160.

New features added to the DAIR cloud infrastructure
In order to ensure DAIR services are current and respond to ever-evolving user needs, CANARIE continued to invest in updates to the DAIR infrastructure. In 2019-20, CANARIE invested in GPUs (graphics processing units) for our private cloud infrastructure; the GPU's are an essential technology in support of products and services requiring machine learning functions.

> *Shane Young,*
> *CEO, inBay Technologies:*
> *"The DAIR Program gave us a much needed, competitive advantage to vault ourselves onto a global stage and compete successfully."*

Piloting the use of commercial cloud, combined with the existing DAIR private cloud, in providing extensible advanced cloud-based capabilities to SMEs for development of products and services
CANARIE expanded its DAIR infrastructure to offer public cloud access. Currently, DAIR users are able to access AWS or Microsoft Azure through the DAIR program, as well as the private GPUs operated by CANARIE. Users access the range of cloud providers via a cloud orchestration tool.

Reduce the time and cost for SMEs to develop new technology skills by providing concise references, software examples, and documentation, packaged together as knowledge packages, which can be deployed on DAIR for study, characterization and ultimately implementation within an SME's product and/or service
CANARIE launched its first set of "BoosterPacks", packages of cloud resources and curated knowledge about emerging technologies, built by Canadian businesses who are willing to share their expertise in that technology. The first wave of BoosterPacks focus on Internet of Things

(IoT), machine learning, and data analytics, and have been built by experienced Canadian SMEs and entrepreneurs.

Content released to educate SMEs on efficient use of cloud services
CANARIE developed a range of marketing materials to educate users on the most efficient use of cloud services, and to demonstrate how users are realizing competitive benefits through their use of DAIR. CANARIE has developed and presented a comprehensive overview of cloud services and continued to present this through the Fundica Roadshow, which targets early-stage Canadian companies, and community engagement at other local events.

In addition to the launch of the new range of DAIR tools, CANARIE also launched a communication channel for DAIR users. This service allows DAIR users to be able to interact with one another and build a national community for SMEs using cloud services.

Centre of Excellence in Next Generation Networks (CENGN):

Overview of Strategy For CENGN
CANARIE is a founding partner in the Centre of Excellence in Next Generation Networks (CENGN). CENGN is a consortium of industry (including: Juniper, Cisco, Nokia EXFO, Bell, TELUS), academic, and research leaders who are pooling their expertise and equipment to lower the barrier to market entry for SMEs and researchers.

CENGN was awarded funding by the Networks of Centres of Excellence program in 2014 and created the governance structure and technical and staff infrastructure to take on projects beginning in mid-2015.

Additional participants in CENGN will be able to leverage the CANARIE network to support advanced testing and demonstration of new ICT products and services
CANARIE continues to play a key role in this initiative as CANARIE network resources are made available to support test-bed infrastructure for new product validation and testing.

3.0 Statement of Eligible Activities for 2020-21 and for the Foreseeable Future

In 2020-21, CANARIE will continue to align its activities towards the goal of strengthening Canada's digital research infrastructure. In 2020-21, CANARIE plans to continue its focus on its three eligible activities:

1. Network Evolution:

CANARIE Network:

Deployment of additional network capacity to meet the growing traffic need
CANARIE will continue to improve the capacity, redundancy and resiliency of the CANARIE network, in order to meet the needs of Canada's research, education, and innovation communities.

Deployment of additional network capacity to support Northern connectivity
CANARIE will improve the capacity, redundancy and resiliency of the CANARIE network in Northern Canada, in order to meet the needs of Canada's research, education, and innovation communities in these regions.

Improved core node reliability
CANARIE will continue to explore opportunities to improve redundancy of the core network and connections to RANs.

Improvement of network security monitoring and measurement system
CANARIE will continue to work with the RANs on the NREN SIEM Deployment Project, to improve the security of both the CANARIE Network and the NREN, and to create a community of NREN security analysts across the country. These projects have been extended into FY21.

Deployment of the Software Networking Applications
CANARIE will continue to explore opportunities and technologies to deploy Network Automation tools for streamlining the network operational processes and improving alert notifications.

Deployment of support tools accessible through the user portal
CANARIE continues to develop features for the network support portal, in order to improve support for users.

Development of commercial cloud support strategy
CANARIE will launch a strategy to support connectivity between institutions and commercial cloud providers.

Launch of the Global Research and Education Network (GREN) map
CANARIE is leading the development of a dynamic map of the Global Research and Education Network ecosystem, which will be launched in FY21.

Security:

Enable data aggregation reporting for the benefit of the entire JSP community
The launch of the next phase of the JSP is expected to launch in the fall 2020, with the goal of including all NREN connected higher education institutions in the project.

Adoption of a cybersecurity framework that will be used internally in security assessments and continuous improvement of CANARIE security posture and cyber risk management
CANARIE will work towards the adoption of NIST Cybersecurity Framework for assessment and incident response.

Implementation and maintenance of an active Vulnerabilities Management Plan to decrease CANARIE's attack surface
CANARIE will increase deployment of security scanners on the internal infrastructure and employ external scan vulnerability tests for improving CANARIE's security posture. In addition, CANARIE is participating in the CUCCIO Security Benchmarking project.

Deployment of Password Control and Identity Management (PAM/IAM) systems and Two Factor Authentication (2FA) where possible
CANARIE has added 2FA capabilities and will work to deploy additional security and Identity Management tools where appropriate.

NREN Program:

Interconnection Agreements executed with all CANARIE-approved RANs
CANARIE will put in place Interconnection Agreements with each of the RANs to ensure that the co-delivery model is sustained and strengthened for the 2020-2024 Mandate. The Agreements will be executed in the first quarter of FY21.

Completion of first competitive funding call issued to meet RAN networks' requirements
The first competitive funding call for the NREN program was launched on April 1, 2020. The purpose of this $3M Competitive Funding Call is to enable RANs to create, extend, or maintain network infrastructure and/or advanced network capabilities to support collaboration and research both nationally and internationally and to enable increased access to, and use of, the NREN.

Technical audits of funded projects
Projects funded under the Competitive Call 1 will be monitored, once selected, contracted, and underway, to ensure that stated milestones are met.

Increased reliability, capacity and security on network segments shared by RANs
CANARIE will complete the project with ORION (Ontario) to provide additional 100G Connectivity between Winnipeg and Toronto. CANARIE and its NREN partners will also launch work on projects to ensure MANRS (Mutually Agreed Norms for Routing Security) compliance across the NREN, and to support defence against a number of key networking threats that includes distributed denial-of-service (DDoS) attacks.

Increase NREN security through continuation of the NREN SIEM project
CANARIE will continue to work with the RANs and the SIEM analysts on the evolution of the NREN SIEM Deployment Project, to improve the security of both the CANARIE Network and the NREN.

Development and launch of projects to enhance security
CANARIE is working with the NREN GC to prioritize and action cybersecurity initiatives to enhance security for the NREN, and for the member institutions. This is the primary focus for

the NREN GC and its Committees and Working Groups in FY21.

Completion of an updated strategic plan to support the evolution of the NREN
Activities in support of the NREN strategic plan continue under the guidance of the NREN Governance Committee and work will take place to finalize and approve the 2020 – 2024 plan.

Development of a RAN in Nunavut
Work will continue, through the relationship established with Nunavut Arctic College, to develop a framework that will support the realization of a RAN in Nunavut.

Network Services – Canadian Access Federation:

Increased adoption of CAF services.
CANARIE will continue to promote the benefits of the Canadian Access Federation – both *eduroam* and Federated Identify Management – to the research and education community. To this end, CANARIE will continue to investigate opportunities to extend the reach and expand the benefit of the CAF identity services, including with the private sector.

2. Technology Innovation

Research Software Program:

Maintain visits to science.canarie.ca consistent with FY20 levels
Science.canarie.ca is the online repository of reusable software tools that have been funded by CANARIE and that are available to all researchers. CANARIE will continue to promote the repository to the research software development community in Canada.

Enhanced documented metrics and best practices for the Local Research Software Support Initiative
CANARIE will continue to build upon the best practices and metrics for the Initiative based on the experiences gained from both the pilot and the projects funded under the Local Research Software Support Call 1.

Execution of the development and maintenance portions of projects funded under platform Calls 2a, 2b and 3
CANARIE will continue execution for all approved Call 2a, Call 2b and Call 3 platform contribution projects. Funding for each project remains dependent on the addition of at least one new research team.

Selection and execution of the first year of projects under Local Research Software Support Call 1
Contracts will be in place for each of the projects funded under Call 1, and execution will have commenced.

Financial audits of funded projects for Calls 2a, 2b and the Local Research Software Support Pilot
CANARIE plans to carry out all necessary financial audits of by the end of 2021-22.

CRSC 2020 held and feedback from attendees documented
The 2020 Canadian Research Software Conference (CRSC) was cancelled due to COVID-19; plans remain in place to host CRSC 2021 in FY22.

Research Data Management Program:

Execution underway for all approved projects in Research Data Management competitive calls
CANARIE will continue execution for all approved projects.

Development of an action plan for RDC's outreach efforts, including Canada's National Data Services Framework
RDC will continue to facilitate discussions of best practices and national data services via additional NDSF Summits and associated stakeholder meetings. The RDC action plan has been approved by the RDC Steering Committee, and will be updated regularly.

Financial audits of Call 1 funded projects completed
CANARIE plans to carry out all necessary financial audits of by the end of 2021-22.

Development and use of RDM services, tools and platforms that enable Canadians to adopt RDM practices and comply with evolving funder policy
CANARIE will continue to fund CARL Portage for the length of the contract which has an end date of September 30, 2020.

Development of end-of-project metrics that demonstrate the impact of targeted funding to the RDM community
CANARIE will collect and submit the approved metrics for the CARL funding.

3. Private Sector Innovation:

DAIR Program:

The total number of DAIR users is greater than 1500 by the end of FY21
CANARIE will continue to accept applicants and to promote the DAIR program, and the benefits of cloud computing, to Canadian SMEs.

New features added to the DAIR cloud platform
CANARIE will leverage Canadian public cloud to speed up SMEs access to new cloud services based on availability, demand and the ability to monitor and control spending within an allocated budget.

Content released to educate SMEs on cloud independence and security in the cloud
CANARIE will develop three or more tutorials published in the form of website documents, blog posts, or short videos intended to increase participant knowledge in the areas of cloud independence, cloud development and cloud security best practices.

Report initial findings and outcomes of the BoosterPack pilot based on user consultation or questionnaire
CANARIE will use the initial results of the BoosterPack pilot to develop metrics for the 2020 – 2024 mandate.

Monitor ongoing cloud usage patterns of SMEs as they develop and test cloud-based applications and services
CANARIE will monitor and evaluate cloud usage patterns to inform stakeholders and provide valuable input for future strategic investments and direction in the DAIR program.

Provide additional BoosterPack Tutorials, in order to reduce the time and cost for SMEs to develop new technology skills
CANARIE expects to release four new BoosterPacks before FY22.

Further advance the partnership between DAIR and CENGN, making participant transitions between programs more apparent and seamless
CANARIE will work with CENGN and other stakeholders to develop an integrated ecosystem of support for SMEs.

Centre of Excellence in Next Generation Networks (CENGN):

Additional participants in CENGN will be able to leverage the CANARIE network to support advanced testing and demonstration of new ICT products and services
There continues to be a robust pipeline of new projects at CENGN that will likely leverage the CANARIE network. CANARIE continues to work with partners at CENGN to evolve the infrastructure to develop an enhanced level of capability.

CANARIE also continues to participate in a number of discussions with public and private sector stakeholders wishing to gain CANARIE's support for new network test-bed initiatives. This interest indicates the critical role of advanced networking in supporting a range of strategic technology research and development projects. CANARIE will continue to work with its stakeholder partners and the Government of Canada to ensure that its powerful network infrastructure is leveraged to support Canadian competitiveness in advanced technologies.

Over the next year, CANARIE will ensure that all activities that have been implemented to achieve these three eligible activities will be successfully completed, in line with the terms and conditions of CANARIE's Contribution Agreement.

4.0 List of Eligible Projects and Funding Provided to Each

4.1 National Research and Education Network Program (NREN)

The NREN program continues to support the advancement of Canada's National Research and Education Network. The program's key objective is to strengthen the impact of Canada's co-delivery model and enable aligned strategic evolution of the NREN based on national priorities. Program objectives are achieved through a variety of initiatives:

- Competitive funding enables provincial/territorial network partners to upgrade network infrastructure and extend provincial network connections;
- Directed funding ensures that the National Research and Education Network evolves in a consistent, coherent and strategic manner;
- Interconnection and Co-delivery funding ensures that provincial and territorial partners support co-delivery of the NREN and comply with the requirements of CANARIE's Interconnection Agreement; and
- Operating and Strengthening the NREN promotes the impact of Canada's co-delivery model.

In 2019-20, $.230M was paid to the RAN partners for Interconnection and Co-delivery.

Table 4.1 details the RAN partners that utilized Competitive NREN funds during the year.

Table 4.1 NREN Program – Competitive Funding ($ 000s)

RAN Partner	Funding		
	2019-20	Commitments	Total
ECN-NB	127	-	127
MRnet	109	-	109
Cybera	44	-	44
Total	**280**	**-**	**280**

Table 4.1a details the RAN partners that utilized Directed NREN funds during the year. This funding supported the installation of Security Information and Event Management (SIEM) deployments at the RANs, the addition of SIEM analysts to the staff at each of the RANs, and security benchmarking licensing for each of the RANs.

Table 4.1a NREN Program – Directed Funding ($ 000s)

RAN Partner	Funding		
	2019-20	Commitments	Total
ORION	536	85	621
RISQ	462	90	552
ECN-NB	410	106	516
BCNET	379	93	472
Cybera	264	92	356
ACORN-NS	252	92	344
ACORN-NL	194	111	305
Yukon College	159	89	248

SRNET	141	93	234
MRnet	108	35	143
ECN-PEI	12	0	12
Aurora College	12	0	12
Total	**2,929**	**886**	**3,815**

4.2 Joint Security Project

The Joint Security Project strengthens the overall security of NREN-connected institutions in the short term, and helps them better understand potential vulnerabilities, by providing a common Intrusion Detection System (IDS) to participating institutions and promoting the sharing of threat data, and by facilitating the development of a community of institutional security specialists to increase institutional awareness of security issues. CANARIE launched the Joint Security Project Phase 2 call for proposals for institutions to deploy their existing security aggregation and visualization platform to meet the needs of the Joint Security Project.

Table 4.2 details the platforms that were approved for funding under that call and the 2019-20 funding and remaining commitment for 137 institutions to participate in the project.

Table 4.2   Joint Security Project – Phase 2 ($ 000s)

	Funding		
	2019-20	**Commitments**	**Total**
Institutional Participation	1,143	2,271	3,414
Platform Projects			
Concordia University	55	232	287
University of Waterloo	42	208	250
McMaster University	82	49	131
Total	**1,322**	**2,760**	**4,082**

4.3 Research Software Program

The Research Software Program leverages the services developed under previous mandates to drive collaborative development of reusable software services and adaptation of existing research platforms for use across multiple research domains, providing researchers with the tools required to accelerate research.

The Research Software Program launched its second funding call of the current mandate in 2017-18. Table 4.3 details the projects that were approved for funding under that call, and funding provided in the year.

Table 4.3   Research Software Program – Call 2a ($ 000s)

Lead Contractor	Funding		
	2019-20	**Commitments**	**Total**
University of Waterloo	128	115	243
University of British Columbia	103	67	170
Queen's University	102	62	164

University of Guelph	96	61	157
University of Waterloo	79	32	111
Total	**508**	**337**	**845**

The Research Software Program launched its third funding call of the current mandate in 2018-19. Table 4.3a details the projects that were approved for funding under that call, and funding provided to each in the year.

Table 4.3a   Research Software Program – Call 2b ($ 000s)

Lead Contractor	Funding		
	2019-20	**Commitments**	**Total**
McMaster University	83	127	210
Simon Fraser University	128	69	197
Ocean Networks Canada	70	100	170
Concordia University	108	56	164
McGill University	99	58	157
Université de Sherbrooke	106	50	156
Bird Studies Canada	115	40	155
Simon Fraser University	102	50	152
University of Guelph	94	56	150
Université de Sherbrooke	106	43	149
École de technologie supérieure	77	72	149
University of Victoria	85	64	149
McGill University	100	49	149
SensorUp Inc	92	57	149
University of Waterloo	108	40	148
CRIM	101	43	144
Queen's University	90	47	137
Ocean Networks Canada	76	49	125
University of Calgary	79	44	123
Total	**1,819**	**1,114**	**2,933**

The Research Software Program launched a local software support pilot in 2018-19. Table 4.3b details the projects that were approved for funding under that pilot, and funding provided in the year.

Table 4.3b   Research Software Program – Local software support pilot ($ 000s)

Lead Contractor	Funding		
	2019-20	**Commitments**	**Total**
Carleton University	70	378	448
McMaster University	253	115	368
University of Regina	117	218	335
Total	**440**	**711**	**1,151**

4.4 Research Data Management

The Research Data Management Program continues to support and enable national initiatives that advance the appropriate management of research data across Canadian sectors, fueling new discoveries and business opportunities.

The Research Data Management Program launched its first funding call of the current mandate in 2018-19. Table 4.4 details the projects that were approved for funding under that call, and funding provided in the year.

Table 4.4   Research Data Management – Call 1 ($ 000s)

Lead Contractor	2019-20	Funding Commitments	Total
University of Saskatchewan	324	95	419
Ontario Brain Institute	293	37	330
University of British Columbia - Library	260	58	318
McGill University	274	22	296
University of Toronto Library	280	-	280
University of Toronto	255	-	255
University of Prince Edward Island	187	31	218
Ocean Networks Canada	203	-	203
CRIM	129	-	129
Total	**2,205**	**243**	**2,448**

In 2019-20, CANARIE committed $2.0M in funding to support the Canadian Association of Research Libraries' (CARL) Portage Network. Table 4.4a details the utilization of the funds during the year.

Table 4.4a   Funding support for CARL ($ 000s)

Lead Contractor	2019-20	Funding Commitment	Total
CARL	608	1,392	2,000
Total	**608**	**1,392**	**2,000**

4.5 Digital Accelerator for Innovation and Research (DAIR) Program

DAIR is an integrated virtual environment that leverages the CANARIE network to enable SMEs to develop and test new ICT and other digital technologies. It combines advanced networking, cloud computing, and storage resources to create an environment to develop and test innovative ICT applications, protocols, and services; perform at-scale experimentation for deployment; and facilitate a faster time to market.

During the first year of the 2015 – 2020 mandate, CANARIE committed funding to partners to manage the DAIR resources and ensure their availability and maintenance for the duration of the mandate. Table 4.5 details the utilization of the funds during the final year of the mandate.

Table 4.5   Digital Accelerator for Innovation and Research (DAIR) Program ($ 000s)

Lead Contractor	Funding		
	2019-20	Commitment	Total
Cybera	348	-	348
Total	**348**	**-**	**348**

CANARIE committed $.130M to the evolution of the existing DAIR program by investing in new generation GPUs in 2018-19. Table 4.5a details the utilization of the funds during the year.

Table 4.5a   GPU pilot for Innovation and Research (DAIR) Program ($ 000s)

Lead Contractor	Funding		
	2019-20	Commitment	Total
Cybera	22	-	22
Total	**22**	**-**	**22**

5.0 Summary of Spending on Eligible Expenditures

Total Eligible Expenditures in 2019-20 were $36.816M. Table 5.0 details the expenditures.

Table 5.0   Eligible Expenditures ($ 000s)

Expenditures	Audited Financial Statements	Commitments at March 31, 2020	Accounting Adjustments*	Total Eligible Expenditures
PROGRAM				
Network Operations				
Network Infrastructure & Services	14,053	4,615	(2,812)	15,856
NREN	4,090	737	(5)	4,822
Technology Innovation				
Research Software	3,632	1,555	(9)	5,178
Digital Infrastructure Innovation (Research Data Management)	2,345	93	(5)	2,433
National Research Data Management (CARL)	608	1,392	-	2,000
Research Data Canada	308	-	-	308
Private Sector Innovation	1,193	9	47	1,249
Total Program	**26,229**	**8,401**	**(2,784)**	**31,846**
Operating Expenses	3,748	962	260	4,970
Total	**29,977**	**9,363**	**(2,524)**	**36,816**

*Accounting adjustments include timing differences for assets purchases and related amortization.

6.0 Statement of Total Funding Received

In 2019-20, CANARIE received $36.816M in total funding to support Eligible Activities. Table 6.0 details the funding sources.

Table 6.0   Total Funding Received ($ 000s)

Funding Received	2019-20
ISED Funding	35,959
User Fees	564
Interest Income	293
Total	**36,816**

Table 6.0a details the 2019-20 Cost Recovery from CANARIE programs.

Table 6.0a   Total Cost Recovery ($ 000s)

Cost Recovery	2019-20	Commitments	Total
Matching Funds			
NREN	1,142	244	1,386
DAIR	39	-	39
Total Matching Funds	**1,181**	**244**	**1,425**
In-Kind Contributions			
Research Software	889	240	1,129
Research Data Management	361	-	361
Total In-Kind Contributions	**1,250**	**240**	**1,490**
Total	**2,431**	**484**	**2,915**

7.0 Criteria Applied to Select Eligible Projects

Project proposals are reviewed relative to the mandatory criteria and the scoring criteria for each program. These criteria are approved by the CANARIE Board of Directors. Evaluation of proposals relative to these criteria constitute the basis for the decision whether or not a project receives CANARIE funding. Projects that fail to meet the mandatory criteria, or fail to meet evaluative criteria to an acceptable degree, are not funded.

8.0 Statement of Compensation

Directors on CANARIE's Board, including officer positions such as Chair, Vice-Chair and Secretary/Treasurer, receive no compensation beyond reimbursement for any reasonable out-of-pocket expenses incurred while performing their duties or attending CANARIE meetings.

The President and CEO of the organization has a compensation package that is benchmarked regularly against external comparatives by an external consultant and overseen by the HR (Executive) Committee of the Board. All other staff positions at CANARIE are classified

according to a structured system that assigns a salary range to each position. The system and staff salaries are regularly benchmarked against comparative organizations by an external consultant.

For the fiscal year ending March 31, 2020, salary ranges for all officers and employees of CANARIE whose total compensation remuneration paid exceeded $100,000 (including any fee, allowance or other benefit) are presented below.

<u>Officers</u>
President and CEO
$337,500 - $468,700

Chief Financial Officer
Chief Technology Officer
Vice-President, Business Development
Vice-President, External Relations
$184,500 - $297,000

<u>Employees</u>
Chief Engineer
Executive Director, Research Data
Manager, Cybersecurity
NREN Coordination Manager
Senior Director, Applications
Senior Director, Finance and Operations
Senior Director, Programs
$153,000 - $243,800

Director, Communications
Senior Network Engineer
$113,700 - $181,700

DevOps Specialist
Finance Manager
Financial Systems Manager
IT Manager
Manager, Analytics
Manager, Network
Manager, Software Development
Manager, Strategic Policy
Network Engineer
Program Accounting Manager
Program Manager, NREN
Program Operations Manager
Senior Cybersecurity Analyst
Software Developer(s)
Solution Architect
Technology Architect, Canadian Access Federation
$105,000 - $144,900

Identity Access Management (IAM) Support Engineer
Network Engineer
Senior IT Specialist
$100,000 - $115,000

9.0 Statement of CANARIE's Investment Policies, Standards, and Procedures

CANARIE's investment strategy is specifically tailored to the duration and quality constraints in terms of investment options imposed by the Statement of Investment Policy and the Contribution Agreement with Innovation, Science and Economic Development Canada. These constraints, while deemed appropriate and necessary to meet the overall objectives of CANARIE, preclude a more active approach to investment management.

Rather than active investment management, the strategy adopted by CANARIE is "buy and hold", based on the following framework:

- Investment maturities will, wherever possible, match the forecasted cash requirements of CANARIE.

- The quantitative limits on investment holdings provide ample structural liquidity to meet the needs of CANARIE. It is appropriate, therefore, to hold less liquid types of approved investments. Value added will be achieved by moving out the "liquidity curve" when possible.

- At all times, CANARIE will hold investments deemed eligible under the Statement of Investment Policy.

Within this context, CANARIE's official Statement of Investment Policy is adopted by the Board of Directors, and reviewed and approved in the year by the Audit & Investment Committee of the Board. It was last reviewed and approved in October 2019. There were no changes to the Policy, standards, or procedures during the year.

10.0 Summary of the Results of Audits and Evaluations Carried Out During the Year

Financial Audit: CANARIE annually provides for a Financial Audit undertaken by independent auditors who are approved each year by CANARIE's membership and overseen by the Audit and Investment Committee of the Board. The results of this Audit are provided to the Minister as part of each year's Annual Report to the Minister. The Financial Audit for the 2019-20 Fiscal Year was completed in June 2020 by BDO Canada LLP, Chartered Professional Accountants.

Recipient Audits: In agreements with Eligible Ultimate Recipients for Eligible Projects, CANARIE is required to provide for the conduct of an audit of:
    (i) any Eligible Project where CANARIE's contribution exceeds $1M,
    (ii) any Eligible Project where CANARIE deems that an audit is appropriate, and
    (iii) a representative sample of projects to which CANARIE has contributed less than $1M,
according to the terms and procedures set out in the Performance and Risk Framework and the Contribution Agreement.

CANARIE includes in its contracts with Eligible Ultimate Recipients a requirement for the conduct of an audit by an auditor selected by CANARIE for all funded projects, regardless of the amount of CANARIE funding received. This provides CANARIE with the ability to audit projects where warranted or deemed appropriate, and to perform representative sample audits.

CANARIE selected two audit firms to manage the recipient audits subsequent to an RFP that was issued for that purpose. The firms audited the projects where funding was provided during the current mandate, according to an audit plan that was developed to meet the requirements of the Contribution Agreement, and the Performance and Risk Framework developed for the current mandate. There were no recipient audits conducted in fiscal 2019-20.

11.0 Equity, Diversity, and Inclusion Activities

CANARIE continues to support the growth of a diverse workforce. All job postings commit to providing accommodations upon request by any candidate. CANARIE also strives for diversity in its Board composition supported by the CANARIE Board Diversity Policy. That policy states: "ensure the Board composition includes a diverse set of perspectives, which reflects our core stakeholders and the varied personal and demographic characteristics of Canadian society."

CANARIE is committed to ensuring diverse populations have access to, and the ability to utilize, the programs and services offered by CANARIE. Work towards developing a RAN in Nunavut is one such example of that commitment.

Specific future activities to support Equity, Diversity, and Inclusion were first included in CANARIE's Business Plan for FY21, and as such, will be reported in the next Annual Report and moving forward.

~ attached ~

CANARIE Inc.
Financial Statements
For the year ended March 31, 2020

	Contents

Independent Auditor's Report

**To the members of
CANARIE Inc.**

Opinion
We have audited the financial statements of CANARIE Inc., which comprise the statements of financial position at March 31, 2020 and the statements of operations, changes in net assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of CANARIE Inc. as at March 31, 2020 and its financial performance and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Opinion
We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of CANARIE Inc. in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information
Management is responsible for the other information. The other information comprises the information included in the annual report.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

We obtained the annual report prior to the date of this auditor's report. If, based on the work we have performed on this other information, we conclude that there is a material misstatement of this other information, we are required to report that fact in this auditor's report. We have nothing to report in this regard.

BDO

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing CANARIE Inc.'s ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate CANARIE Inc. or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing CANARIE Inc.'s financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of CANARIE Inc.'s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on CANARIE Inc.'s ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause CANARIE Inc. to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

BDO Canada LLP

Chartered Professional Accountants, Licensed Public Accountants

Ottawa, Ontario
June 25, 2020

March 31	**2020**	2019
Assets		
Current		
Cash	$ 12,852,244	$ 1,209,539
Investments (Note 2)	6,975,699	8,403,362
Accounts and other receivable	807,960	685,014
Prepaid expenses and deposits (Note 3)	3,627,575	5,733,763
	24,263,478	16,031,678
Investments (Note 2)	648,258	-
Prepaid expenses and deposits (Note 3)	4,337,579	4,985,809
Tangible capital assets, assets under capital lease and intangible asset (Note 4)	12,577,050	12,154,333
	$ 41,826,365	$ 33,171,820
Liabilities and Net Assets		
Current		
Accounts payable and accrued liabilities (Note 5)	$ 4,553,851	$ 3,258,845
Deferred funding (Note 6)	9,847,235	4,704,768
Current portion of obligation under capital lease (Note 8)	2,130,617	224,157
	16,531,703	8,187,770
Deferred funding (Note 6)	4,457,160	3,137,704
Deferred capital funding (Note 7)	12,715,251	12,288,160
Obligation under capital lease (Note 8)	697,052	2,546,067
	34,401,166	26,159,701
Commitments (Note 9)		
Net Assets		
Unrestricted	54,790	185,934
Internally restricted royalty fund	2,433,629	2,383,275
Internally restricted for windup of operations	4,936,780	4,442,910
	7,425,199	7,012,119
	$ 41,826,365	$ 33,171,820

On behalf of the board:

H. Eddy A. Campbell   Director   _Tom Chandle_   Director

The notes are an integral part of these financial statements.

5

For the year ended March 31	Unrestricted	Internally Restricted Royalty Fund (Note 10)	Internally Restricted for Windup of Operations (Note 10)	2020	2019
Balance, beginning of the year	$ 185,934	$2,383,275	$4,442,910	$7,012,119	$6,682,560
Membership	297,294	-	-	297,294	287,700
Investment income	3,929	50,354	93,870	148,153	119,833
Expenses	(32,367)	-	-	32,367	(77,974)
Excess of revenues over expenses	268,856	50,354	93,870	413,080	329,559
	454,790	2,433,629	4,536,780	7,425,199	7,012,119
Interfund transfers (Note 10)	(400,000)	-	400,000	-	-
Balance, end of the year	$ 54,790	$2,433,629	$4,936,780	$7,425,199	$7,012,119

The notes are an integral part of these financial statements.

6

For the year ended March 31	**2020**	2019
Revenues		
Industry Canada / ISED funding	$ 29,977,129	$ 22,248,299
Membership	297,294	287,700
Investment income	148,153	119,833
	30,422,576	22,655,832
Expenses (Schedule)		
Program	26,229,453	18,649,770
Operating	3,747,676	3,542,440
Corporate	32,367	77,974
Joint Security Project	-	56,089
	30,009,496	22,326,273
Excess of revenues over expenses	$ 413,080	$ 329,559

The notes are an integral part of these financial statements.

7

For the year ended March 31	Program	Operating	Corporate	Joint Security Project	2020 Total
Direct program	$ 18,193,486	$ -	$ -	$ -	$ 18,193,486
Employee and consultants	4,601,421	2,617,686	17,660	-	7,236,767
Marketing and promotion	350,904	103,365	-	-	454,269
Travel	366,110	91,921	-	-	458,031
Rent	-	398,277	-	-	398,277
General office and supplies	33,337	162,698	8,191	-	204,226
Meetings and conferences	38,044	101,720	-	-	139,764
Equipment, software and maintenance	80,318	141,848	-	-	222,166
Professional fees	416	36,121	-	-	36,537
Interest on obligation under capital lease	111,713	-	-	-	111,713
	23,775,749	3,653,636	25,851	-	27,455,236
Plus: amortization	2,453,704	94,040	6,516	-	2,554,260
	$ 26,229,453	$ 3,747,676	$ 32,367	$ -	$ 30,009,496

The notes are an integral part of these financial statements.

8

For the year ended March 31	Program	Operating	Corporate	Joint Security Project	2019 Total
Direct program	$ 11,599,556	$ -	$ -	$ 50,202	$ 11,649,758
Employee and consultants	3,723,405	2,482,142	25,436	5,887	6,236,870
Marketing and promotion	307,948	123,039	26,110	-	457,097
Travel	247,944	79,498	-	-	327,442
Rent	-	339,854	-	-	339,854
General office and supplies	55,501	179,873	15,364	-	250,738
Meetings and conferences	40,426	94,051	-	-	134,477
Equipment, software and maintenance	57,566	113,991	-	-	171,557
Professional fees	92,827	24,917	-	-	117,744
Interest on obligation under capital lease	118,695	-	-	-	118,695
	16,243,868	3,437,365	66,910	56,089	19,804,232
Plus: amortization	2,405,902	105,075	11,064	-	2,522,041
	$ 18,649,770	$ 3,542,440	$ 77,974	$ 56,089	$ 22,326,273

The notes are an integral part of these financial statements.

CANARIE Inc.
Statement of Cash Flows

For the year ended March 31	2020	2019
Cash flows from operating activities		
Industry Canada / ISED funding	$ 35,958,824	$ 20,400,000
Membership	294,469	280,200
Program - interest	293,256	175,203
Program - user fees	452,417	260,933
Investment income - Corporate	3,929	7,509
Investment income - Royalty Fund	50,354	41,984
Investment income - Windup of Operations	93,870	70,340
Program expenses	(20,001,402)	(16,947,396)
Operating expenses	(3,781,936)	(3,442,920)
Corporate expenses	(75,027)	(16,474)
Joint Security Project expenses	-	(56,089)
	13,288,754	773,290
Cash flows from investing activities		
Acquisition of tangible capital assets and intangible asset	(2,821,079)	(1,993,376)
Proceeds on disposal of tangible capital assets	30	180
Purchase of investments	(34,325,000)	(18,786,103)
Proceeds from disposal of investments	35,500,000	20,530,027
	(1,646,049)	(249,272)
Cash flows from financing activities		
Repayment of obligation and interest under capital lease	-	(269,081)
Net increase in cash	11,642,705	254,937
Cash, beginning of the year	1,209,539	954,602
Cash, end of the year	$ 12,852,244	$ 1,209,539

The notes are an integral part of these financial statements.

1. **Significant Accounting Policies**

Purpose of Organization

CANARIE Inc. was incorporated on March 5, 1993 as a non-profit organization without share capital under Part II of the Canadian Corporations Act. CANARIE Inc. was continued under section 211 of the Canada Not-for-profit Corporations Act on November 19, 2013. The objective of CANARIE Inc. is to support the development of the communications infrastructure for a knowledge-based Canada.

As a corporation constituted exclusively for the purpose of carrying on or promoting scientific research and experimental development, CANARIE Inc. is exempt from the payment of income taxes under Section 149(1)(J) of the Income Tax Act (Canada).

Basis of Accounting

The financial statements have been prepared in accordance with Canadian accounting standards for not-for-profit organizations.

Use of Estimates

The preparation of financial statements in accordance with Canadian accounting standards for not-for-profit organizations requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from management's best estimates as additional information becomes available in the future. Areas of significant estimates include useful lives of tangible capital assets, assets under capital lease and intangible asset.

Deferred Funding

Deferred funding relates to (1) funding received, including interest earned on funding, user fees collected and other recovered eligible costs, in advance of the funding period; (2) funding received for future service; and (3) funding received with respect to the purchase of tangible capital assets, assets under capital lease and intangible asset.

When tangible capital assets, assets under capital lease and intangible asset are disposed, the proceeds increase the deferred funding balance and the net book value decreases the deferred funding balance related to tangible capital assets, assets under capital lease and intangible asset.

1. **Significant Accounting Policies** (continued)

Revenue Recognition   The organization follows the deferral method of accounting for contributions. Restricted contributions are recognized as revenue in the year in which the related expenses are incurred. Unrestricted contributions are recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

Funding related to tangible capital assets, assets under capital lease and intangible asset is deferred and recognized as revenue in the same year as the amortization expense of the related tangible capital assets, assets under capital lease and intangible asset.

Service contracts are recognized over the period of the services provided.

Membership fees are recognized over the period of membership.

Financial Instruments   *Measurement*
The organization initially measures its financial assets and liabilities at fair value. The organization subsequently measures all its financial assets and liabilities at amortized cost, except for short-term investments which it chose to measure at fair value. Changes in fair value are recognized in the statement of operations.

Impairment
Financial assets measured at amortized cost are tested for impairment when there are indicators of impairment.

Transaction costs
The organization recognizes its transaction costs in the statement of operations in the year incurred for financial instruments measured at fair value. Financial instruments that are subsequently measured at amortized cost are adjusted by the transaction costs in the initial measurement of the asset or liability.

1. **Significant Accounting Policies** (continued)

Tangible Capital Assets and Intangible Asset

Tangible capital assets and intangible asset are stated at cost less accumulated amortization. Amortization is provided on the basis of their useful lives using the following methods and annual rates:

Computer equipment	3 years straight-line basis
Equipment	3 years straight-line basis
Leasehold improvements	over the term of the lease
Furniture	5 years straight-line basis
Network equipment	5 years straight-line basis
Computer software	2 years straight-line basis

Impairment of Tangible Capital Assets and Intangible Asset

When a tangible capital asset or intangible asset no longer has any long-term service potential to the organization, the excess of its net carrying amount over any residual value is recognized as an expense in the statement of operations.

Leases

Leases are classified as capital or operating leases. A lease that transfers substantially all of the benefits and risks incidental to the ownership of property is classified as a capital lease. All other leases are accounted for as operating leases wherein rental payments are expensed as incurred.

Assets under capital lease are stated at cost less accumulated amortization. They are amortized on a straight-line basis over the expected useful life of the asset to the organization, not to exceed twenty years, which currently corresponds to the term of the lease.

Contributed Services

During the year, voluntary services (including donated time and travel of board and committee members) were provided. Because of the difficulty of determining their fair value, contributed services are not recognized in the financial statements.

Presentation of Expenses

Program development, design and implementation activities are classified as program expenses. Activities which are not directly in support of Programs are classified as operating expenses. Activities not eligible for funding under the current contribution agreement are classified as either corporate or royalty fund expenses.

2. Investments

Investments consist of Canadian government treasury bills with annual yields of 0.75% maturing in March 2021, short-term provincial government coupon bonds with annual yields ranging from 1.64% to 1.86% and maturities ranging from April 2020 to March 2021, short-term guaranteed investment certificates with annual yields ranging from 1.77% to 2.38% and maturities ranging from April 2020 to February 2021, and cash held in investment savings accounts with an annual yield of 0.55%.

Investments include a long-term guaranteed investment certificate with a fair value of $648,258, with an annual yield of 1.98% maturing in July 2021.

3. Prepaid Expenses and Deposits

	2020	2019
Program prepayments and deposits	$ 7,744,522	$10,561,849
Operating prepayments	184,132	121,223
Rental deposit	36,500	36,500
Balance, end of the year	7,965,154	10,719,572
Current portion	3,627,575	5,733,763
Long-term portion	$ 4,337,579	$ 4,985,809

4. **Tangible Capital Assets, Assets under Capital Lease and Intangible Asset**

	2020			2019	
	Cost	**Accumulated Amortization**	Cost	Accumulated Amortization
Computer equipment	$ 608,472	$ 492,824	$ 631,349	$ 451,226
Equipment	132,345	130,687	132,345	125,721
Leasehold improvements	464,519	464,519	464,519	455,632
Leasehold improvements under construction	320,940	-	-	-
Furniture	242,515	224,607	232,816	212,651
Art	2,139	-	-	-
Network equipment	15,499,651	11,134,273	12,995,753	9,772,732
Fibre under capital lease	12,712,911	5,080,462	12,674,885	4,061,883
Computer software	258,348	137,418	202,629	100,118
	$30,241,840	$ 17,664,790	$27,334,296	$ 15,179,963
Net book value		$ 12,577,050		$ 12,154,333

During the year, computer equipment with a cost of $69,430 (2019 - $15,773) and accumulated amortization of $69,430 (2019 - $15,773) was disposed and removed from the total cost and total accumulated amortization.

Accounts payable and accrued liabilities include purchased tangible capital assets with a cost of $318,577 (2019 - $162,863).

During the year, the organization acquired fibre under capital leases with a cost of $38,026 (2019 - $98,345), with a total of $Nil (2019 - $Nil) being financed through the obligation under capital lease.

5. Accounts Payable and Accrued Liabilities

	2020	2019
Accounts payable and accrued liabilities	$ 4,553,851	$ 3,215,860
Government remittances payable	-	42,985
	$ 4,553,851	$ 3,258,845

6. Deferred Funding

Pursuant to Funding Agreements signed on October 9, 2015, September 4, 2012, March 28, 2007, and March 28, 2002, the organization received funding of $113,658,824, $62,000,000, $120,000,000 and $110,000,000 respectively from Innovation, Science and Economic Development Canada ("ISED") (formerly known as Industry Canada) for the design, development, deployment, improvement and operations of the CANARIE network and programs.

The balance of the funds has been reflected as follows:

	2020	2019
Balance, beginning of year	$ 7,842,472	$ 8,784,944
Industry Canada / ISED funding received	35,958,824	20,400,000
Program - user fees	609,906	364,825
Program - interest	293,256	175,203
Program - service contracts	4,157	10,879
Direct program and operating expenses	(27,429,385)	(19,681,233)
Transfer to operating for the acquisition of tangible capital assets, assets under capital lease and intangible asset	(2,974,835)	(2,156,057)
Joint Security Project expenses	-	(56,089)
Balance, end of year	14,304,395	7,842,472
Current portion	9,847,235	4,704,768
Long-term portion	$ 4,457,160	$ 3,137,704

7. **Deferred Capital Funding**

Deferred capital contributions represent amounts funded by Industry Canada / ISED for the purchase of tangible capital assets, assets under capital lease and intangible asset. Deferred funding related to tangible capital assets, assets under capital lease and intangible asset is summarized below:

	2020	2019
Balance, beginning of year	$12,288,160	$12,643,080
Funding received related to the acquisition of tangible capital assets, assets under capital lease and intangible asset	2,974,835	2,156,057
Amortization of program and operating assets	(2,547,744)	(2,510,977)
Balance, end of year	$12,715,251	$12,288,160

8. Obligation Under Capital Lease

	2020	2019
Capital lease for indefeasible rights of use of fibre, 4.35%, due December 2024, payable by monthly installments of $22,423, principal and interest.	$ 1,155,116	$ 1,155,116
Capital lease for indefeasible rights of use of fibre, 3.50%, due April 2020, payable by one installment of $1,672,553, principal and interest	1,672,553	1,615,108
	2,827,669	2,770,224
Less: current portion	2,130,617	224,157
	$ 697,052	$ 2,546,067

Minimum lease payments required in the next four years under the capital lease are as follows:

2021	$ 2,210,713
2022	269,081
2023	269,081
2024	201,811
	2,950,686
Less: interest included in minimum payments	123,017
	$ 2,827,669

9. **Commitments**

On November 20, 2019, the organization entered into a new lease agreement for a office space commencing on April 1, 2020, which expires March 31, 2025. Future minimum annual lease payments under this operating lease (which includes base rent and the current charge for additional rent) for the premise are due as follows:

2021	$	501,735
2022		606,928
2023		617,238
2024		617,238
2025		617,238
	$	2,960,377

As of March 31, 2020, the organization had commitments of $466,925 with respect to an office renovation project.

As at March 31, 2020, the organization had commitments of $14,051,773 with respect to the Network, DAIR, Research Software, NREN and Research Data Management programs.

10. **Internally Restricted Net Assets**

Royalty Fund
During the 2007/2008 fiscal year, Industry Canada granted CANARIE Inc. the authority to retain royalties collected after March 31, 2007 and to use these funds in a manner to be determined by CANARIE Inc. and its legal counsel. Annual allocations to the fund include investment income of $50,354 (2019 - $41,983). Disbursements from the fund represent payments to approved funded projects. The fund cannot be reallocated without the approval of the Board of Directors.

Windup of Operations
During the 1998 fiscal year, CANARIE Inc. established a fund for the eventual wind up of its operations or for the transition to a new mode of business. In either event, the fund will be used to pay operating expenses. The objective was to allocate to the fund an amount between 50% and 75% of the organization's annual operating budget. Management performs an annual review of the sufficiency of this fund and confirms that its objective is met. Annual allocations to the fund include investment income of $93,870 (2019 - $70,340). At March 31, 2020, the organization transferred $400,000 from its unrestricted net assets to Windup of Operations to maintain the fund. The fund cannot be reallocated without the approval of the Board of Directors.

11. Economic Dependence

On October 9, 2015, ISED entered into a contribution agreement with CANARIE Inc. to contribute funding totaling $105,000,000. The contribution agreement was amended on March 29, 2019 and increased the total funding to $113,658,824. Of the total contribution, $15,000,000 was received in fiscal 2016, $20,000,000 was received in fiscal 2017, $22,300,000 was received in fiscal 2018, $20,400,000 was received in fiscal 2019, and $35,958,824 was received in fiscal 2020. The current contribution agreement ended on March 31, 2020.

On July 6, 2019, ISED entered into a contribution agreement with CANARIE Inc. to contribute funding totalling $137,000,000 over the next 4 years. The new contribution agreement begins on April 1, 2020 and will end on March 31, 2024.

12. Financial Instruments

Interest rate risk
Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. Fixed rate instruments subject the organization to a fair value risk while variable rate instruments subject it to a cash flow risk. The organization is exposed to this risk for its short-term investments. The risk associated with investments is reduced to a minimum since these assets are invested in short-term maturities.

13. Comparative Information

The comparative information has been reclassified where applicable to conform to the financial statement presentation used in the current year.

14. COVID-19

On March 11, 2020 the World Health Organization declared COVID-19 a pandemic which also created a high degree of global economic uncertainty. The financial impact on the organization has been minimal as a result of the pandemic.