



CANARIE ANNUAL REPORT

for

Innovation, Science and Economic Development (ISED) Canada

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1. 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 over 30-year history, CANARIE has helped shape Canada's digital landscape by leading, among others, the following initiatives:

- 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, and 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;
- working with global peers to align international research and education infrastructures to support globally collaborative research, now formalized via the Global Network Advancement Group (GNA-G);
- developing the grid certificate authority in Canada that provides secure access to data generated from the Large Hadron Collider and other advanced digital technologies;
- supporting the uptake of cloud technology by Small and Medium-sized Enterprises (SMEs) in Canada;
- identifying gaps in research software and championing the development of powerful research software tools to efficiently enable researchers across many disciplines to accelerate discovery, now transitioned to the Digital Research Alliance of Canada as part of the Digital Research Infrastructure (DRI) Strategy; and
- supporting Research Data Canada to align research data activities within Canada and internationally, now transitioned to the Digital Research Alliance of Canada as part of the DRI Strategy.

This continual evolution of CANARIE and its activities can be seen in the tremendous advances in aligning the sector on a highly coordinated approach to enhancing cybersecurity for research and post-secondary education, which has most recently led to the integration of CanSSOC (the Canadian Shared Security Operations Centre), a community-incubated approach to shared cybersecurity, into CANARIE in May 2022. Initial steps toward this vision will enable coordination among local institutional cybersecurity specialists, together with regional and national cybersecurity experts, to detect and respond to evolving cybersecurity threats.

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 2020-2025 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 2021, 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 2023-24 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);
- supporting a collaborative approach to improving cybersecurity in the research and education ecosystem;
- championing the development of research software, research data management, and collaboration tools (now transitioned to the Digital Research Alliance of Canada); and
- providing entrepreneurs 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 (DRI) and continues to partner with the Digital Research Alliance of Canada (the Alliance) in support of the Government of Canada's DRI Strategy.

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 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 volumes 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. CANARIE completed the deployment of additional network capacity on select network segments. This deployment has significantly improved network availability, ensuring that there is sufficient network capacity in the event of network outages.

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 to meet the evolving needs of the research community in Canada. Of note is the on-going

execution of the 2020-2024 NREN Strategic Plan, which supports the 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 Global Research and Education Network CEO Forum, the Global Marketing Communications Group (SIG-Marcomms), the Global R&E Network Advancement Group (GNA-G), and the eduGAIN Steering Committee. CANARIE's participation in these and other communities ensures that Canada's digital research infrastructure evolves to enable Canada to participate and lead globally collaborative research.

CANARIE supports mission-critical research at a range of government laboratories, assisting Shared Services Canada (SSC) in network and network-based services planning and execution. As well, a CANARIE representative sits on the Government of Canada's Canadian Forum for Digital Infrastructure Resilience (CFDIR) to work with industry and government towards identifying existing and anticipating future resilience issues, and then finding solutions. 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 Canada's post-secondary students, faculty, and staff to securely access remote resources using digital identities from their home institutions. This service enables seamless access to protected online content and data repositories, and global research instruments and compute facilities, via Federated Identity Management (FIM), and to campus Wi-Fi networks through *eduroam*. CANARIE continues to see significant growth in the use of these services, and identity management is increasingly seen as a key pillar of institutions' cybersecurity defenses. These collaboration tools are part of a broader, international federation of federations, in which CANARIE actively participates.

Cybersecurity

Cybersecurity is a significant and growing concern for all sectors, but organizations in the research and education sector operate in a uniquely complex environment: large and mobile user bases; policies that support "bring-your-own device" to campus; and significant amounts of Information Technology (IT) infrastructure outside the purview of central IT. These organizations also hold massive amounts of data of value to cyber threat actors, particularly those backed by nation states. This data not only includes personal data of staff, faculty, and students, but also commercially valuable intellectual property developed by academic researchers and funded by federal research granting agencies - often in collaboration with industrial and/or international partners.

CANARIE is working to help secure this sector through the creation and implementation of its Cybersecurity Initiatives Program (CIP) and its federating role in CanSSOC. CANARIE's cybersecurity activities are guided thanks to input from the Cybersecurity Advisory Committee (CAC) and its standing committees. With representation from a cross-section of Canada's research and education institutions and supporting organizations, these committees provide insights on the priorities, realities, and challenges of the sector and advise CANARIE on proposed CIP initiatives.

Research Software

Recognizing that software is essential infrastructure to support access to data and its computation, CANARIE invested in research software tools, starting in 2007. CANARIE's long-term vision was to enable software reuse and software development best practices within Canada's research community. Through its Research Software Program, CANARIE spearheaded the development of 146 reusable software tools and supported the onboarding of new researchers onto existing research software tools. To maximize the impact of these investments, CANARIE took steps to ensure these software tools are available to all researchers.

CANARIE's most recent funding calls have added support for the modification and maintenance of existing research software platforms to meet the needs of research teams and funded local software expertise on campuses to enable and support the use of research software tools. Research Software activities have been transitioned to the Alliance, in line with the DRI Strategy.

Research Data Management

Beginning in 2014, CANARIE provided funding for Research Data Canada (RDC) and its programs, enabling opportunities for greater integration of the elements of digital research infrastructure. More recently, CANARIE launched a Research Data Management program to fund the development of national data management tools and software. The program funded 14 research teams to develop software components and tools to enable Canadian researchers to adopt best practices in managing data resulting from scientific research. With the transition of research data management activities to the Alliance, FY22 was the last year that CANARIE supported these programs. CANARIE actively worked with the Alliance over the course of FY21, FY22, and FY23 to seamlessly transfer responsibility for the Research Data Management program to the Alliance to ensure continuity for the community. This transition is now complete.

Private Sector Innovation

CANARIE enables the private sector to leverage advanced digital infrastructure to accelerate the commercialization process. The DAIR Cloud Program has supported over 2,100 small and medium-sized enterprises (SMEs) to develop and test a range of novel Information and Communications Technology (ICT) products and services. DAIR provides SMEs with an opportunity to benefit from the scale and agility of cloud resources (computing and storage resources 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 incentivize businesses to adopt cloud technologies as part of their long-term business strategy.

Additionally, to support the use of emerging technologies that can leverage cloud resources, CANARIE launched the DAIR "BoosterPacks" initiative. BoosterPacks are curated packages of resources and sample code for a specific emerging technology, available to SMEs in Canada at no cost, built by experienced Canadian SMEs. These experienced SMEs – "BoosterPack Builders" – curate their knowledge and expertise to help earlier stage businesses understand and overcome challenges in key emerging technologies such as machine learning, IoT, blockchain, and cybersecurity. The goal of each

BoosterPack is to help early-stage SMEs get to market faster by benefitting from tips and resources that helped the Builders, while avoiding some of their pitfalls.

CANARIE continues to promote the use of DAIR and the transformative power of cloud technologies to the SME community through a range of media and case studies, published on the CANARIE website. This content highlights businesses' use of DAIR and the tangible competitive value delivered using cloud infrastructures. Additionally, the Innovation and Commercialization Committee, comprising executives and technical experts from SMEs and innovation centres, helps drive the evolution of CANARIE's private sector activities.

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 connections and support 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 our Canadian NREN Partners, the Digital Research Alliance of Canada (the Alliance), the CFI, Universities Canada, the U15, CUCCIO, CAUBO, Colleges and Institutes Canada, Polytechnics Canada, Fédération des cégeps, Genome Canada, and the granting councils. CANARIE has worked closely with the Alliance to manage the transition of the Research Software and Research Data Management programs to them, and the two organizations are committed to working together to support the Government of Canada's DRI Strategy, and to provide Canada's researchers with world-class tools to support their research workflow.

CANARIE's role in the digital research infrastructure landscape continues to solidify through premier events such as the CANARIE 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. Statement of Eligible Activities for 2023-24 and Report on the Extent to Which CANARIE Met the Expected Results

Throughout its 2020-2025 mandate period, CANARIE will support the Government of Canada’s DRI Strategy. CANARIE’s activities in the fourth year of this mandate were aligned with the strategic goal to “ensure that Canadian researchers have the digital tools they need to support scientific excellence.”¹

CANARIE’s three eligible activities in the 2023-24 Business Plan are detailed below. A report on the extent to which each eligible activity was achieved is contained in the paragraphs following.

2.1 Network Operations

Evolve and extend Canada’s world-leading collaboration network

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.

2.1.1 CANARIE Network

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-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 low, 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 2023-24 were:

*Simon Fraser University
TRIUMF*

*University of Victoria
SHARCNET*

University of British Columbia

Deployment of additional network capacity to support traffic growth

CANARIE completed the deployment of additional network capacity on select network segments. This deployment has significantly improved network availability, ensuring that there is sufficient network capacity during network outages. Additionally, the new capacity enables CANARIE to support data-intensive experiments and testing by the CANARIE team and researchers, with no impact on production traffic.

¹ <https://www.ic.gc.ca/eic/site/136.nsf/eng/home>

Improved access to commercial cloud services

CANARIE continues the improvement of commercial cloud connectivity, which supports the use of cloud technologies at connected institutions for research, education, and central IT purposes. In FY24, CANARIE established a new 100Gbps Private Network Interconnect (PNI) with Google to support cloud connectivity and improving access to Google content. Furthermore, two PNIs with Amazon Web Services (AWS) were upgraded from 10Gbps to 100Gbps, a tenfold improvement in network capacity. As NREN cloud service evolves, these 100Gbps connections will be crucial to support traffic growth in the coming years.

Continued work on the 400Gbps capacity upgrade

CANARIE is deploying 400Gbps capable routers in the network. The network will be able to operate at 400Gbps capacity when both routers and the underlying fibre optical system is upgraded to 400Gbps, which has started in Western Canada. This multi-year project remains on track.

Continued work on the refresh of the Eastern and Central Fibre Systems

The lease for the eastern fibre, which serves as the busiest corridor of the network and connects major locations like Toronto, Ottawa, and Montreal, as well as two major exchange points in the US (Chicago and New York), will expire soon.

CANARIE began planning the refresh in FY22, seeking fibre availability, and evaluating various options. By starting the planning process early, CANARIE is working to mitigate any potential disruptions to ensure a smooth transition from the old system to the new one.

The first contract to deliver this was executed in March 2024, with further contracts under negotiation.

The Central fibre system refresh is nearing completion. The Calgary-Regina segment deployment has been completed and the Regina-Winnipeg segment is scheduled to be completed in FY25.

Deployment of additional network capacity to support Northern connectivity

In FY24, CANARIE successfully worked with Nunavut Artic College (NAC) to connect the first sites in Nunavut to the NREN using Low Earth Orbit (LEO) satellite technology. This deployment completed the Canadian NREN, with all 13 provinces and territories now connected to the NREN, and marked a significant technological advance, as Canada became the first NREN globally to utilize LEO technologically within its infrastructure, to bring high-speed connectivity to Indigenous communities.

Improvement of the network security reporting, monitoring, and measurement system

CANARIE began a new initiative with CENGN to build a monitoring and measurement tool named Haystack. The tool monitors network route reachability announcements to identify network routing integrity and security anomalies. Once detected, the system's automation and reporting capability will inform the CANARIE operation team. The system has the potential to be extended to the NREN Partners for their internal use.

Launch of version 1 of the Global Research and Education Network (GREN) Map

Through a collaboration with GÉANT (the pan-European research and education network) and RNP (Brazil's National Research and Education Network), CANARIE released version 1 of the GREN Mapping tool in August 2023. There will be a presentation to the global community at TNC 2024 to encourage the onboarding of additional NRENs.

Deployment of Software Networking Applications

Beginning in early FY24, CANARIE has been collaborating with Global NREN Partners ESnet (USA) and SURF (the Netherlands) towards the deployment of software networking applications, adapting a software application, Workflow Orchestrator, developed by SURF and also used by ESnet. CANARIE leverages these partners' software development expertise to adapt the Orchestrator for use on the CANARIE Network. This collaboration has been helpful to the CANARIE Network and application teams in understanding the software and required needs and efforts for deployment.

Deployment of support tools accessible through the user portal

CANARIE continues to enhance its network operation tools to support its Network team and the network operators of NREN Partners. CANARIE began the development of its revised Internet Route Registry (IRR) tool in early FY24. The IRR tool helps NREN operators to maintain IP (Internet Protocol) address information, ensuring IP addresses are propagated through NREN networks correctly. The first production release of the IRR tool will be in Q1 of FY25.

Other Achievements: Network

International Partnerships – CEO Forum

CANARIE continues to participate as an active member of the Global Research and Education Networks' CEO Forum. This Forum brings together the CEOs of 17 research and education networks – both national and supranational - to collaborate on the global evolution of critical digital infrastructures and associated services. The Forum provides an opportunity for Canadian representation and leadership on a broad range of global research and education initiatives that include networking evolution, shared marketing collateral, and identity management. The most recent face-to-face meeting took place in February 2024.

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 support research more seamlessly. 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. In support of the model being advanced by GNA-G, CANARIE operates a global R&E exchange point, MOXY, in Montreal, to support international data flows.

International Partnerships – NA-REX

CANARIE, along with six advanced research and education networks and exchange point consortia in the U.S., established a new high-performance experimental network service (NA-REX), connecting global exchange points in North America. NA-REX interconnects international exchange points in North America using a common architecture, integrated services, shared tools, and aligned operations, providing enhanced R&E network services through improved connectivity, performance, capacity, shared tools, and operational coordination. NA-REX will also support experimental network applications and testing.

International Partnerships – ANA upgrades

The Advanced North Atlantic (ANA) collaboration is a joint effort between research and education networks in North America and Europe to provide improve trans-Atlantic connectivity (both in terms of capacity and resiliency) at a lower cost and greater resiliency than any individual partner would be able to accomplish alone. The ANA collaboration is based on capacity sharing, reciprocal backup agreements, and joint operations of high-speed interconnects.

In FY24, CANARIE, Internet2, ESnet, and GÉANT, jointly announced the deployment of three 400 Gbps spectrum circuits between exchange points in the U.S., U.K., and France, bringing the combined capacity of the ANA collaboration’s trans-Atlantic network to 2.4 Terabits-per-second (Tbps), or 2.4 trillion bits per second.

CANARIE Summit

The CANARIE Summit was held in October 2023, aligned with the sixth annual NREN Assembly. The CANARIE Summit’s theme was “Disrupting the Disrupters,” highlighting how disruptions including cybersecurity can be beneficial for innovation. The Summit now attracts international attendees, and the 2023 Summit had an overall attendee experience rating of 96%.

2.1.2 Infrastructure Extension Program (IEP)

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

CANARIE continued to support existing IEP connections throughout FY24 in concert with Shared Services Canada and is working with relevant research facilities to extend their IEP services for the coming year.

2.1.3 Canadian Access Federation (CAF) Program

As the national operator of the Canadian Access Federation (CAF), CANARIE works with stakeholder groups to identify demand for network services and collaborates with national and global partners to deliver them. Through CAF’s Federated Identity Management (FIM) service, Canada’s post-secondary students, faculty, and staff at participating institutions can access protected online content using their home institutions’ digital identities. Institutions participating in CAF also benefit from the *eduroam*

service, which provides students, faculty, and staff with secure, seamless access to Wi-Fi at participating sites in 106 territories worldwide.

Increased adoption of CAF

In 2023-24, the total number of CAF participants increased to 242. CANARIE continues to work with our NREN Partners to explore new ways to promote CAF adoption.

Increased number of eduroam log-ins per year

CANARIE supported 422 million authenticated *eduroam* log-ins in Canada in FY24, with the service fully recovered to above pre-pandemic levels and normal usage patterns.

Increased number of projects to upgrade the capacity capability of the Federation

32 projects were undertaken in FY24 to upgrade the capacity and capabilities of the Federation. CANARIE added projects that optimized AWS utilization, upgraded capacity to improve *eduroam* Visitor Access (eVA), and made improved FIM performance through upgrades to our federation manager.

Increased number of interfaces, applications, and tools available to support CAF services

At the end of FY24, 19 tools were available to support CAF services, including *eduroam*, eVA, and FIM support.

Other Achievements – CAF:

eduroam in Non-Campus Environments

CANARIE continues to work to increase the number of non-campus locations (e.g., libraries, municipalities, and airports) that are broadcasting *eduroam*, to increase the service's reach and its value to the community. In FY24, the Calgary International Airport, the busiest airport in Alberta and the fourth busiest in Canada (by passenger traffic), began broadcasting *eduroam*.

2.1.4 Cybersecurity Initiatives Program (CIP) (referred to as the Joint Security Project in CANARIE's Contribution Agreement)

In response to the need identified by Canada's research and education community for national coordination and alignment of cybersecurity efforts, CANARIE invests in initiatives that will strengthen the whole sector with advanced technologies, improved processes, and broadened expertise. These initiatives are primarily accessible by eligible organizations through the provincial and territorial partners in Canada's National Research and Education Network (NREN).

Initiatives funded by the CIP – including the CanSSOC services - will support the evolution of a complementary set of capabilities at all layers - from local to national - which collectively supports the goal of strengthening the overall cybersecurity of the sector. Funding supports activities that address priorities or gaps with the greatest potential to advance cybersecurity across the broadest portion of the ecosystem, and funded initiatives must equitably allow all eligible organizations to participate in and/or benefit from them.

New initiatives deployed at eligible organizations

CANARIE, with the support of its regional NREN Partners, continues to onboard participants to CIP initiatives, with 217 eligible organizations out of 221 having executed an agreement with CANARIE by the end of FY24.

In FY24, CANARIE launched the sixth initiative under the CIP, CIRA DNS off-network protection. This initiative extends the CIRA DNS Firewall Service to provide cybersecurity protection to users' devices when they are not connected to their institutional networks.

97% of eligible organizations are participating in the CIP. For each individual initiative the participation is:
81% - Threat Feed
81% - DNS Firewall
68% - Intrusion Detection System
76% - Cybersecurity Benchmarking
63% - National Cybersecurity Assessment

Community cybersecurity event hosted

CANARIE held a pilot Canadian SecuR&E Forum event in conjunction with the CANARIE Summit, laying the groundwork for a future conference dedicated to strengthening the diverse community that is collaborating to secure Canada's R&E sector. This inaugural standalone event was held in Q1 FY25.

An incident response system deployed

The team of NREN Information Security Leaders continued the work of advising the development of the NREN CanSSOC Federated Security Operations Centre (SOC) Pilot and the operating structures. Requirements for an integration platform were finalized and a Security Orchestration, Automation, and Response (SOAR) platform was selected. This platform will provide the infrastructure for integrating existing Security Information and Event Management (SIEM) technologies, enriching incidents and providing a common environment for the Federated SOC Analysts across the country. During this time the SOC Analyst team was staffed by individuals spanning across the country and representing all participating regions.

Other Achievements – CanSSOC:

CanSSOC Engagement

The CANARIE CanSSOC team continues to work with the community to issue additional threat information to the community, and to encourage sharing among the community. In FY24, the CANARIE CanSSOC team issued 295 alerts (threat information specific to a single institution), and 50 sector-wide advisories. The monthly Canadian Higher Education Security Session (CHESS) Calls also regularly attracted over 150 participants. The CanSSOC Slack channel, which facilitates information sharing between organizations, had close to 300 active members at any given time in FY24, from approximately 100 different organization.

As well as engaging domestically, the team also regularly engages with shared SOC teams in the R&E sector in Canada's Five Eyes Partner countries, to ensure the flow of threat intelligence.

CanSSOC Rebranding

CANARIE, in partnership with broader higher education community, launched a new visual identity and brand for CanSSOC, which now represents the federal, provincial, and institutional activities which support national cybersecurity services.

Research Intensive Group (RIG) – Non-Contribution Agreement Activity

With the contributions of funding and collaboration, the 14 research-intensive universities and CANARIE continued to make significant progress on the selected pilot projects. The successful completion of a Dark Web Monitoring project and its subsequent inclusion in CanSSOC threat intelligence services will extend the benefit of that service to the greater community. The People and Process Pilot will help inform many of the processes within the Federated SOC Pilot. The final technical project is promising to help extend the national detection and alerting capabilities using Machine Learning/Artificial Intelligence to improve detection and response capabilities across extremely large volumes of data aggregated from across the sector.

2.1.5 NREN Program

Canada's National Research and Education Network (NREN) operates on a co-delivery model, as a partnership between CANARIE and its provincial and territorial NREN Partners. CANARIE provides interprovincial and international connectivity, while the regional partners provide connections to institutions and organizations within their jurisdictions. Data that travels out of a province or territory traverses CANARIE Network links to NREN Partners 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 is driven by a vision to ensure users coast-to-coast-to-coast have a comparable user experience within Canada, and to users of NRENs in other countries. CANARIE's NREN Program enables NREN Partners to increase capacity and reliability of network equipment and infrastructure; to enable network management (tools and training); and to extend the reach of NREN Partner networks to more institutions.

Execution underway for projects defined in the NREN FY24 Operational Plan

The NREN Governance Committee (GC) continued to strengthen delivery capabilities through a review of project management processes and practices for NREN activities. Efforts focussed on developing and implementing a more systematic and cohesive approach that will be followed throughout project life cycles.

The NREN GC also developed draft Guiding Principles for the Canadian NREN, to support last year's activity to develop a shared Mission and Vision for the NREN. These guiding principles will be used as the compass for updated strategic and operational plans and will guide investment priorities.

Additionally, the NREN Partners drafted a network roadmap for the federated network that will first focus on resiliency of the overall network. This initiative seeks to enhance adaptive capabilities to major disruptions (e.g. natural disasters) that could result in service outages.

Two public constituent consultations were organized to garner input on approaches and opportunities for the NREN to offer direct cloud connectivity services. Building on these consultations, next steps may include the development of cloud connect services employing network automation.

Execution underway for all approved projects in NREN Call 2, 3, & 4 for increased reliability, capacity, and resiliency of networks operated by NREN Partners

The second, third, and fourth competitive funding calls for the NREN Program were launched across Fiscal Years 21-24 with \$4.9M, \$2.42M, and \$1.67M in funding respectively.

The purpose of these funding calls is to enable NREN Partners to create, extend, or improve 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.

Projects from NREN Call 2 have been fully implemented and are awaiting audit. Execution is underway for all approved projects across NREN Calls 3 and 4.

Increase NREN security through continuation of the NREN SIEM project and continued development of the federated NREN Cybersecurity Analyst team

Partners across the NREN participated in the NREN SIEM Project, which began with a joint, national procurement of a Security Information and Event Management (SIEM) tool at nine NREN Partners. The project also incorporated the hiring of dedicated cybersecurity analysts at 11 NREN Partners, thereby creating a community of security practitioners across the country. This dedicated group of Cybersecurity Analysts continue to work together to protect the NREN community by efficiently leveraging resources and processes to create a national view of the NREN security posture, with local implementation.

Development and launch of projects to enhance security

The NREN introduced work on security metrics to measure advancements towards improving, securing, and maintaining the NREN's security posture.

Continued progress towards the technical implementation of the Nunavut NREN Partner

As noted previously, in FY24, CANARIE successfully worked with Nunavut Artic College (NAC) to connect Nunavut to the NREN using Low Earth Orbit (LEO) satellite technology. This activity supports interconnectivity in 5 (five) initial communities: Iqaluit, Ranklin Inlet, Cambridge Bay, Arviat, and Clyde River.

Organization of an NREN Assembly event to foster engagement between NREN Partners

CANARIE held the sixth annual NREN Assembly - collocated with the CANARIE Summit in October 2023 – with a focus on improving collaboration in a distributed NREN.

2.2 Technology Innovation:

Following the transition of the Research Software and Research Data Management programs to the Alliance, there were no reportable activities in FY24.

2.3 Private Sector Innovation

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

2.3.1 DAIR Program

To leverage CANARIE resources and capabilities in support of private sector innovation, CANARIE's DAIR Cloud Program enables small and medium-sized enterprises (SMEs) to access and productively leverage powerful cloud computing resources to advance their ICT research and development efforts. DAIR provides an opportunity for entrepreneurs to accelerate time-to-market and de-risks the innovation process for SMEs by reducing their need to invest in large, in-house computing resources, and facilitates on-going communications among DAIR participants so that SMEs and entrepreneurs can freely exchange best practices and lessons learned with like-minded individuals. DAIR exposes SMEs 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.

DAIR allows SMEs to "focus on the development without worrying about the infrastructure and cost. I can focus on clients' problems and my solution to them. Removing the friction for founders so that they can focus on building their business is astounding."

*Hayyan Daoud
Founder and CEO, BOMS*

Provide additional BoosterPacks, to reduce the time and cost for SMEs to develop new technology skills

CANARIE released a new BoosterPack – a curated package of resources and sample code for a specific emerging technology - built by Winnipeg-based FormKiQ, to support Artificial Intelligence (AI) powered automated document classification and discovery.

Increased usage of the DAIR Cloud

By the end of FY24, participation in the DAIR Cloud Program increased to 2,144 Canadian SMEs, surpassing the mandate goal of 2,092. The total number of BoosterPack views grew to 5,011 (surpassing the mandate goal of 2,400).

New features added to the DAIR Cloud Platform; and content released to educate SMEs on cloud independence and security in the cloud

CANARIE provided DAIR Cloud users with 23 new features in FY24, as part of the first phase of a project to enhance the breadth of AWS offerings available within DAIR. The first round of enhanced offerings allows users to protect, route, and balance traffic to their web applications, and provide secure identity and access management. Additional enhanced offerings will be made available in FY25.

Monitor ongoing cloud usage patterns of SMEs as they develop and test cloud-based applications and services

Since 2018, DAIR participants have raised over \$50 million in additional investments, secured more than \$8.7 million in grants, and registered over 50 patents in the U.S.

CANARIE monitors participant usage patterns and services in use to support program planning and prioritization for future enhancements to the DAIR Cloud.

In FY24, this led to the launch of the DAIR GPU Boutique Model, to support high-use SMEs in fields such as Artificial Intelligence (AI), which require the computing capabilities of Graphics Processing Units (GPUs) to efficiently solve the equations within their models.

2.3.2 Centre of Excellence in Next Generation Networks (CENGN)

CANARIE is a founding partner in the Centre of Excellence in Next Generation Networks (CENGN), which was launched in 2015. CENGN is a consortium of industry, academic, and research leaders who are pooling their expertise and equipment to lower the barrier to market entry for SMEs and researchers.

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 CENGN initiatives, as CANARIE Network resources are made available to support test-bed infrastructure for new product validation and testing as required.

2.4 Activities Supporting Equity, Diversity, and Inclusion

CANARIE embraces the diversity of the communities it serves, and as such, is committed to activities that advance Equity, Diversity, and Inclusion (EDI).

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.”

Engagement with submarine Arctic cable consortia to support Northern connectivity

CANARIE continued to engage with international partners on the possibility of deploying connectivity to Europe and Japan via the Arctic – not only would this provide resiliency for existing trans-Atlantic connectivity, but it would also improve connectivity in Canada’s North.

Continued progress towards the technical implementation of the Nunavut NREN Partner

As previously referenced, CANARIE supported the connection of Nunavut to the NREN via LEO Satellite connectivity.

Creation of a framework for CANARIE Employee Resource Groups

CANARIE developed a framework for Employee Resource Groups (ERGs) within the organization, to create a sense of belonging for employees within CANARIE, and successfully supported the launch of the first ERG focused on professional development.

Carrying out recommendations of a third-party review of CANARIE's corporate policies

CANARIE conducted a third-party review of existing corporate policies, in order to highlight areas for improvement vis-a-vis our EDI vision. Additionally, all CANARIE staff who are responsible for the drafting and reviewing of corporate policies were trained on policy-writing that incorporates EDI principles.

Other Achievements – EDI:

Inclusion in Cybersecurity Canada

CANARIE was a founding partner in the development of Inclusion in Cybersecurity Canada, a dynamic community that fosters diversity in the Canadian Research and Education sector. Committed to bridging the talent gap, Inclusion in Cybersecurity Canada provide a supportive environment for women and gender-diverse individuals through education, partnership, mentorship, and community building.

3. Statement of Eligible Activities for 2024-25 and for the Foreseeable Future

In 2024-25, CANARIE will continue to align its activities towards the goal of strengthening Canada's digital research infrastructure, with a focus on the three eligible activities, as laid out in the 2024-25 Business Plan.

3.1 Network Operations

3.1.1 Network Program

Deployment of additional network capacity to support traffic growth

CANARIE will continue to deploy additional capacity to ensure the network remains suitable for the needs of the research, education, and innovation communities.

Improved Access to commercial cloud services

CANARIE will continue to work with NREN Partners and connected organizations to understand their connectivity needs, building on the findings of CANARIE's FY23 pilot.

Continued work on the 400Gbps capacity upgrade

CANARIE will continue the successful installation of 400Gbps routers and upgrades to 400Gbps optical systems in FY25.

Continued work on the refresh of the Central and Eastern fibre systems

CANARIE continues the work to refresh these two key fibre corridors, which will support network speeds to 400Gbps and beyond, equipping the optical infrastructure to support traffic growth of intensive global scientific research.

Deployment of additional network capacity to support Northern connectivity

CANARIE will improve the capacity, redundancy, and resiliency of the CANARIE Network in Northern Canada, to meet the needs of Canada's research, education, and innovation communities in these regions.

Improvement of the network security reporting, monitoring, and measurement system

CANARIE will continue to work with the NREN Partners on the NREN SIEM Deployment Project, to improve the security of both the CANARIE Network and the NREN, and to maintain a community of NREN security analysts across the country. CANARIE is also working with CENGN on a project to enhance network visibility through Border Gateway Protocol (BGP) route monitoring, enabling analysis of routing integrity and Resource Public Key Infrastructure (RPKI) validation.

Ongoing improvements to Global Research and Education Network (GREN) Map

Following the launch of the GREN Map, CANARIE will continue to work with the international community to support its evolution and update the map as necessary.

Deployment of Software Networking Applications

CANARIE will continue the collaboration of software development with global NREN Partners in deploying network automation tools that streamline network operational processes and improve alert notifications.

Deployment of support tools accessible through the user portal

CANARIE continues to develop features for the Network Support Portal to improve coordination and support of the Network with partners.

3.1.2 Infrastructure Extension Program (IEP)

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

CANARIE continues working with Shared Services Canada to evaluate departmental needs in supporting the government science community.

3.1.3 Canadian Access Federation Program (CAF)

Increased adoption of CAF

CANARIE will continue to promote the benefits of the Canadian Access Federation – both *eduroam* and Federated Identify Management – to the research and education community.

Increased number of eduroam log-ins

CANARIE will continue to support the technical and operational requirements for eduroam growth.

Increased number of projects to upgrade the capacity/capability of the Federation

CANARIE will continue to investigate opportunities to extend the reach and expand the benefit of CAF identity services, including with the private sector, and to integrate CAF services with the broader cybersecurity portfolio offered by CANARIE. This will include an *eduroam* as a service pilot offering.

Increased number of interfaces, applications, and tools available to support CAF services

CANARIE will continue to develop interfaces, applications, and tools to support CAF services.

3.1.4 Cybersecurity Initiatives Program (CIP)

Deploy new initiatives at eligible organizations

CANARIE will work with the Cybersecurity Advisory Committee (CAC) to develop a strategic framework guiding the ongoing evolution of cybersecurity capabilities across the sector, and to define and implement the next set of initiatives. This work will be supported by a technical architecture built by the Cybersecurity Technical Committee (CTC) and the development of an Investment Analysis and Blueprint

for cybersecurity in the post-secondary sector. The Investment Analysis will provide a comprehensive understanding of the current cybersecurity investment landscape – benchmarking against baseline capabilities identified in complementary cybersecurity programs – while the Blueprint will provide an outline of the essential components and best practices needed for a secure R&E organization in Canada.

This work is paired with work with the NREN Partners to develop an investment profile to understand the funding made by our Provincial and Territorial Partners in cybersecurity services, similar to the annual Aggregated NREN Network Investment Report.

Host community cybersecurity event

CANARIE will build on the success of the inaugural SecuR&E Forum to host a standalone community cybersecurity event.

Deploy Security Orchestration, Automation and Response platform (SOAR) to support the NREN CanSSOC pilot

CANARIE will continue its work to deploy a SOAR platform to support the technology implementation of the NREN CanSSOC Pilot across 23 institutions and 8 NREN Partners. The Pilot will evaluate the delivery of federated detection and response services across a selected set of use cases.

Increase National cybersecurity analyst capacity across the NREN to support the CanSSOC pilot

CANARIE will continue to work with its regional partners to build on the success of the CanSSOC Pilot and expand cybersecurity analyst capacity across the NREN.

Develop plan to implement the long-term CanSSOC vision

CANARIE will develop the long-term plan for CanSSOC based on the lessons from the NREN CanSSOC Pilot. The national level federated SOC service investments that CANARIE will make will be integrated into the strategic framework developed by the CAC, and together with the work to better understand the overall funding – currently and required – in the R&E sector, will ensure that federal investments will be targeted towards highest need initiatives with the best return on investment.

3.1.5 NREN Program

Execution underway for projects defined in the three-year NREN FY25-28 Operational Plan (to be revisited on a yearly basis)

CANARIE will continue execution of all approved projects.

Completion of all approved projects in NREN Calls 2, 3, and 4

CANARIE will continue execution of all approved projects from NREN Calls 2, 3, and 4.

Execution underway to continue establishing the NREN in Nunavut and connect beyond the initial 5 communities

CANARIE will continue to work with and support Nunavut Artic College to expand the NREN in Nunavut beyond the initial five communities.

Increase NREN security through continuation of the NREN SIEM project and continued development of the federated NREN cybersecurity analyst team; and Development and launch of projects to enhance the security of NREN infrastructures

CANARIE and the NREN Partners will work to improve the security of the foundational infrastructure for Canadian research, education, and innovation.

3.2 Technology Innovation

3.2.1 Innovation Projects

Continued investigation and validation of identified projects ahead of the FY26-30 Mandate

CANARIE will continue to work with the Government of Canada to bring forward programs and projects that support the outcomes of CANARIE's Contribution Agreement.

3.3 Private Sector Innovation

3.3.1 DAIR Program

Increase usage of the DAIR Cloud

CANARIE will continue to accept applicants and promote the DAIR Program and the benefits of cloud computing, to SMEs in Canada.

New features added to the DAIR Cloud platform

CANARIE will further leverage Canadian public cloud to speed up SMEs' access to new cloud services – including GPUs used for machine learning and artificial intelligence – based on availability, demand, and the ability to monitor and control spending within an allocated budget.

Content released to educate SMEs on cloud computing and emerging technologies

CANARIE will develop tutorials - published in the form of website documents, blog posts, or short videos - to increase participant knowledge in the areas of cloud independence, cloud development, and cloud security best practices.

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, to reduce the time and cost for SMEs to develop new technology skills

CANARIE has three additional BoosterPacks in development for FY25.

3.3.2 CENGN Network Testbed

CENGN will be able to leverage the CANARIE Network to support advanced testing and demonstration of new ICT products and services

CANARIE continues to work with partners at CENGN to identify projects that could leverage the CANARIE Network.

CANARIE also continues to participate in discussions with public and private sector stakeholders wishing to use the CANARIE Network to validate new products. 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.

3.4 Activities Supporting Equity, Diversity, and Inclusion:

In 2024-25 CANARIE will continue to implement activities that support EDI. CANARIE plans to continue working with the Alliance, and our expected outcomes for 2024-25 include:

- Continued engagement with submarine Arctic cable consortia, which would include support for Northern Connectivity
- Ongoing support for CANARIE Employee Resource Groups
- Ongoing training for staff

Over the next year, CANARIE will work to ensure that these activities are implemented, in line with the terms and conditions of CANARIE's Contribution Agreement.

4. 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;
- Northern Initiatives facilitate connectivity to Northern Canada;
- 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.

Table 4.1 details the NREN Partners that used Competitive NREN funds.

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

NREN Partner	Funding					Commitments	Total
	2020-21	2021-22	2022-23	2023-24			
ORION	-	1,363	1,190	1,693		111	4,357
RISQ	-	-	87	1,001		152	1,240
Cybera	17	128	39	244		10	438
BCNET	96	-	58	235		3	392
MRnet	-	-	-	208		11	219
ACORN-NS	-	-	-	196		-	196
SRNET	-	-	-	183		-	183
ECN-NB	-	-	-	130		-	130
ECN-PEI	-	-	30	-		-	30
Total	113	1,491	1,404	3,890		287	7,185

In 2023-2024, the NREN Program extended the funding of the Cybersecurity Analyst at each of the NREN Partners. Table 4.1b details the use of the funds during the year.

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

NREN Partner	2023-24
RISQ	92
ORION	88
BCNET	87
Yukon University	85
Cybera	80
SRNET	75
ECN-UNB	64
MRnet	56
Nunavut Arctic College	49
ACORN-NL	46
ECN-PEI	9
Total	731

In 2023-2024, the NREN Program committed funding to expand connectivity to Northern Canada. Table 4.1c details the use of the funds.

Table 4.1c NREN Program – Northern Connectivity (\$000s)

NREN Partner	Funding					
	2020-21	2021-22	2022-23	2023-24	Commitments	Total
Nunavut Arctic College	-	-	-	253	225	478
Total	-	-	-	253	225	478

In 2023-24, \$0.191M of Directed Funding was used to secure technical support for security infrastructure and renewal of server maintenance services for each of the NREN Partners.

In 2023-24, \$0.255M was paid to the NREN Partners for Interconnection and Co-delivery.

4.2 Cybersecurity Initiatives Program (CIP)

The CIP provides investments in initiatives that will strengthen cybersecurity efforts of the research and education sector with advanced technologies, improved processes, and broadened expertise. These initiatives are delivered to eligible organizations through the provincial and territorial partners in Canada's NREN.

The Intrusion Detection System (IDS) initiative was launched in 2020-21. Table 4.2a details the use of the funds for participating institutions and 3 IDS platform projects to develop and support analytics under that initiative.

Table 4.2a Intrusion Detection System (\$000s)

Platform Projects	Funding				
	2020-21	2021-22	2022-23	2023-24	Total
Institutional Participation	129	192	231	885	1,437
Platform Projects					
Concordia University	28	99	133	254	514
University of Waterloo	50	75	95	244	464
Fyelabs	50	27	38	41	156
Total	257	393	497	1,424	2,571

The Threat Feed initiative was launched in 2022-23. Table 4.2b details the use of the funds.

Table 4.2b Threat Feed and National Security Analyst (\$000s)

Initiative	Funding				
	2020-21	2021-22	2022-23	2023-24	Total
Threat Feed	498	863	285	95	1,741
National Security Analyst	-	157	-	-	157
Total	498	1,020	285	94	1,898

In 2023-24:

1. \$3.285M was used to secure CIRA DNS Firewall services for eligible organizations.
2. \$0.301M was used to launch CIRA DNS off-network protection.
3. \$2.434M was used to support the NREN CanSSOC Federated Security Operations Centre Pilot.
4. \$1.948M was used to support the CUCCIO Cybersecurity Benchmarking initiative.
5. \$0.838M was used to support the National Cybersecurity Assessment.
6. \$0.232M was paid to the NREN Partners for community collaboration support.

4.3 Research Software Program

The Research Software Program leveraged 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.

The Research Software Program launched its first funding call of the current mandate in 2020-21. Table 4.3a details the projects that were approved for funding under that call, and the use of the funds.

Table 4.3a Research Software Program – Call 3 (\$000s)

Lead Contractor	Funding				
	2020-21	2021-22	2022-23	2023-24	Total
Ontario Institute for Cancer Research	100	99	100	-	299
The Governing Council of the University of Toronto	64	131	97	3	295
University of Victoria	77	123	100	(8)	292
The Royal Institution for the Advancement of Learning/McGill University	88	90	84	3	265
Queen's University	51	99	100	-	250
University of Waterloo	50	99	100	-	249
École de Technologie Supérieure	41	109	100	(2)	248
Simon Fraser University	29	119	100	-	248
Bird Studies Canada	50	97	100	-	247
Université du Sherbrooke	50	100	100	(5)	245
London Health Sciences Centre Research Inc.	97	80	96	(34)	239
University of Waterloo	44	106	85	-	235
McGill University	41	74	90	12	217
Concordia University	25	49	85	-	159
Total	807	1,375	1,337	(31)	3,488

The Research Software Program launched the first Local Research Software Support call of the current mandate in 2020-21. Table 4.3a details the projects that were approved for funding under that call, and the use of the funds.

Table 4.3b Research Software Program – Local Research Software Support - Call 1 (\$000s)

Lead Contractor	Funding				
	2020-21	2021-22	2022-23	2023-24	Total
Simon Fraser University	90	307	203	-	600
University of Calgary	58	218	324	-	600
Sunnybrook Research Institute	126	190	284	-	600
University of Ottawa	34	306	260	-	600
University of Sherbrooke	71	214	290	25	600
University of Laval	73	240	196	(2)	507
Total	452	1,475	1,557	23	3,507

4.4 Research Data Management

The Research Data Management Program supported and enabled national initiatives that advanced 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 2020-21. Table 4.4a details the projects that were approved for funding under that call, and the use of the funds.

Table 4.4a Research Data Management – Call 2 (\$000s)

Lead Contractor	Funding			
	2020-21	2021-22	2022-23	Total
The Hospital for Sick Children	326	335	(38)	623
Indoc Research	248	251	-	499
Simon Fraser University	223	257	(2)	478
Total	797	843	(40)	1,600

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.

DAIR committed funding to partners to manage the DAIR resources and ensure their availability and maintenance for the duration of the mandate. Table 4.5a details the use of the funds.

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

Lead Contractor	Funding				
	2020-21	2021-22	2022-23	2023-24	Total
Cybera	151	258	155	113	677
Total	151	258	155	113	677

In 2023-24, \$0.103M was paid to support BoosterPack Tutorials and \$0.509M was paid to support the cloud platform.

5. Summary of Spending on Eligible Expenditures

Total Eligible Expenditures in 2023-24 were \$53.821M. Table 5.0 details the expenditures.

Table 5.0 Eligible Expenditures (\$000s)

Expenditures	Audited Financial Statements	Accounting Adjustments*	Total Eligible Expenditure 2023-24**
PROGRAM			
Network Operations			
Network Infrastructure & Services	14,112	9,471	23,583
Network Security	876	(121)	755
Cybersecurity	9,688	5,455	15,143
NREN	6,725	(37)	6,688
Technology Innovation			-
Research Software	255	(4)	251
Private Sector Innovation	1,962	(65)	1,897
Total Program	33,619	14,698	48,317
Administration Expenses	5,830	(326)	5,504
Total	39,449	14,372	53,821

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

**Funding for Total Eligible Expenditures includes 2023-24 funding of \$42.357M and \$11.464M of unspent funds carried forward from 2022-23.

6. Statement of Total Funding Received

In 2023-24, CANARIE received \$42.357M in total funding to support Total Eligible Expenditures. Table 6.0 details the funding sources.

Table 6.0 Total Funding Received (\$000s)

Funding Received	2023-24
ISED Funding	40,600
User Fees	630
Interest Income	1,127
Total	42,357

Table 6.0a details the 2022-23 Cost Recovery from CANARIE programs.

Table 6.0a Total Cost Recovery (\$000s)

Cost Recovery	2023-24
Matching Funds	
NREN	2,521
DAIR	17
Total	2,538

7. 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 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. 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.

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For the fiscal year ending March 31, 2024, salary ranges for all officers and staff of CANARIE whose total compensation remuneration paid exceeded \$100,000 (including any fee, allowance, or other benefit) are presented below.

Officers

President and CEO

\$350,000 - \$468,700

Chief Financial Officer

Chief Technology Officer

Vice President, Business Development

Vice President, Cybersecurity Programs and Services

Vice President, External Relations

Vice President, Legal and Corporate Governance

\$198,000 - \$304,000

Staff

Chief of Network Engineering

Senior Director, Applications

Senior Director, CanSSOC Services

Senior Director, Corporate Strategy

Senior Director, Cybersecurity

Senior Director, Cybersecurity Programs

\$162,000 - \$250,000

Director, Communications

Director, Cybersecurity Engineering

Director, Cybersecurity Operations

Director, Cybersecurity Services Innovation

Director, Finance

Director, IT

Director, Legal Affairs

Director, Network Engineering

Director, NREN Cybersecurity Services

Director, Project Management Office

Director, Program Operations

Director, Strategic Policy and International Relations

Senior Architect, Network Engineering

Senior Network Architect

\$123,000 - \$219,000

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Controller
Cybersecurity Analyst
Data Analytics Developer
DevOps Specialist
Information Security Developer
Financial Systems Manager
Manager, Analytics
Manager, Corporate Administration
Manager, Cybersecurity
Manager, Finance
Manager, Financial Processes
Manager, Human Resources
Manager, Program Accounting
Manager, Program Adoption
Manager, Project Management Office
Manager, Software Development
Network Architect
Program Manager, Cybersecurity Initiatives Program
Program Manager, Identity and Access Management
Program Manager, NREN
Senior Cybersecurity Analyst
Senior Program Operations Coordinator
Senior, Program Analyst
Software Developer
Solution Architect
Technical Writer
Technology Architect, Canadian Access Federation
\$100,000 - \$161,000

Cybersecurity Analyst
Digital Marketing Specialist
Financial Accountant
Financial Reporting Officer
Identity Access Management Support Specialist
Program Manager, Private Sector Innovation
Project Manager
Senior IT Specialist
Software Developer
Software Test Lead
Test Developer
Support Specialist, Cloud
\$100,000 - \$131,000

9. 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 2023. There were no changes to the Policy, standards, or procedures during the year.

10. 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 2023-24 Fiscal Year was completed in June 2024 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.

Through a competitive procurement process, CANARIE selected two audit firms to manage the recipient audits. 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.

The following table reflect the audits performed in fiscal 2023-24 by program.

Table 10.0 Recipient Audits – Research Software

Lead Contractor	Project
Simon Fraser University	Local Research Software Support
Sunnybrook Research Institute	Local Research Software Support
University of Calgary	Local Research Software Support
Université Laval	Local Research Software Support
University of Ottawa	Local Research Software Support
Université de Sherbrooke	Local Research Software Support
Bird Studies Canada	Bird Studies Motus
Concordia University	Atlascine
École de Technologie Supérieure	PAVICS-Hydro2
Lawson Health	Data Driven Human Blood Flow
McGill University	CBRAIN
McGill University	LORIS
Ontario Institute for Cancer Research	Overture DM System
Queen's University	SlicerAIGT
Simon Fraser University	IRIDA
Université de Sherbrooke	GenAP
University of Toronto	OpenMS
University of Victoria	CANFAR App
University of Waterloo	iEnvironment
University of Waterloo	OpenPNM

Appendix 1: CANARIE Inc. Financial Statements – March 31, 2024

~ attached ~

CANARIE Inc.
Financial Statements
For the year ended March 31, 2024

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Independent Auditor's Report

To the members of CANARIE Inc.

Opinion

We have audited the financial statements of CANARIE Inc., which comprise the statement of financial position at March 31, 2024 and the statement 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, 2024 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.

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

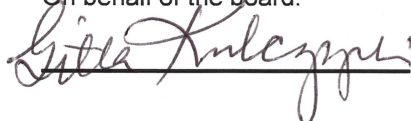
Chartered Professional Accountants, Licensed Public Accountants

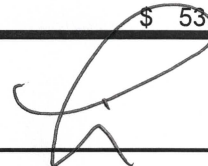
Ottawa, Ontario
June 27, 2024

CANARIE Inc.
Statement of Financial Position

March 31	2024	2023
Assets		
Current		
Cash	\$ 12,059,495	\$ 2,459,680
Investments	-	23,034,972
Accounts and other receivables (Note 2)	1,907,498	722,348
Prepaid expenses and deposits (Note 3)	8,121,219	5,400,420
	22,088,212	31,617,420
Investments	-	384,227
Prepaid expenses and deposits (Note 3)	8,194,956	5,344,826
Tangible capital assets, assets under capital lease and intangible asset (Note 4)	23,332,246	14,898,317
	\$ 53,615,414	\$ 52,244,790
Liabilities and Net Assets		
Current		
Accounts payable and accrued liabilities (Note 5)	\$ 2,796,749	\$ 4,652,748
Deferred revenue	27,500	65,000
Deferred funding (Note 6)	10,114,933	18,790,831
Current portion of obligations under capital leases (Note 8)	2,004,002	709,293
	14,943,184	24,217,872
Deferred funding (Note 6)	8,194,956	5,344,826
Deferred capital funding (Note 7)	19,758,297	10,645,119
Obligations under capital leases (Note 8)	1,569,947	3,543,905
	44,466,384	43,751,722
Commitments (Note 9)		
Net Assets		
Unrestricted	90,564	82,111
Internally restricted royalty fund	2,613,791	2,510,084
Internally restricted for windup of operations	6,444,675	5,900,873
	9,149,030	8,493,068
	\$ 53,615,414	\$ 52,244,790

On behalf of the board:

 Director

 Director

CANARIE Inc.
Statement of Changes in Net Assets

For the year ended March 31	Unrestricted	Internally Restricted Royalty Fund (Note 10)	Internally Restricted for Windup of Operations (Note 10)	2024	2023
Balance, beginning of the year	\$ 82,111	\$2,510,084	\$ 5,900,873	\$ 8,493,068	\$ 8,077,324
Membership Investment income	357,083	-	-	357,083	348,125
Corporate expenses	3,392	103,707	243,802	350,901	138,996
	(52,022)	-	-	(52,022)	(71,377)
Excess of revenues over expenses	308,453	103,707	243,802	655,962	415,744
	390,564	2,613,791	6,144,675	9,149,030	8,493,068
Interfund transfers (Note 10)	(300,000)	-	300,000	-	-
Balance, end of the year	\$ 90,564	\$2,613,791	\$ 6,444,675	\$ 9,149,030	\$ 8,493,068

CANARIE Inc.
Statement of Operations

For the year ended March 31

2024

2023

Revenues

Industry Canada / ISED funding	\$ 39,448,393	\$ 32,952,797
Research Intensive Group funding	874,689	257,491
Membership	357,083	348,125
Investment income	350,901	138,996

41,031,066 33,697,409

Expenses (Schedule)

Program	33,618,883	27,136,648
Operating	5,829,510	5,816,149
Research Intensive Group	874,689	257,491
Corporate	52,022	71,377

40,375,104 33,281,665

Excess of revenues over expenses

\$ 655,962 \$ 415,744

CANARIE Inc.
Schedule of Expenses

For the year ended March 31	Program	Operating	Research Intensive Group	Corporate	2024 Total
Direct program	\$ 19,015,537	\$ -	\$ 510,825	\$ -	\$ 19,526,362
Employee and consultants	10,502,412	3,769,289	363,864	36,285	14,671,850
Marketing and promotion	114,613	94,386	-	-	208,999
Travel, meetings and conferences	624,412	228,005	-	-	852,417
Rent	-	618,984	-	-	618,984
General office and supplies	41,359	330,138	-	15,737	387,234
Computer software and supplies	169,077	288,885	-	-	457,962
Professional fees	4,901	43,960	-	-	48,861
Interest on obligations under capital leases	148,256	-	-	-	148,256
	30,620,567	5,373,647	874,689	52,022	36,920,925
Plus: amortization	2,998,316	455,863	-	-	3,454,179
	\$ 33,618,883	\$ 5,829,510	\$ 874,689	\$ 52,022	\$ 40,375,104

CANARIE Inc.
Schedule of Expenses

For the year ended March 31	Program	Operating	Research Intensive Group	Corporate	2023 Total
Direct program	\$ 16,358,042	\$ -	\$ 113,818	\$ -	\$ 16,471,860
Employee and consultants	7,561,385	3,839,656	143,034	60,913	11,604,988
Marketing and promotion	83,592	83,606	639	-	167,837
Travel, meetings and conferences	243,941	180,441	-	-	424,382
Rent	-	605,719	-	-	605,719
General office and supplies	14,696	302,150	-	10,464	327,310
Computer software and supplies	153,728	278,858	-	-	432,586
Professional fees	62,883	38,240	-	-	101,123
Interest on obligations under capital leases	163,067	-	-	-	163,067
	24,641,334	5,328,670	257,491	71,377	30,298,872
Plus: amortization	2,495,314	487,479	-	-	2,982,793
	\$ 27,136,648	\$ 5,816,149	\$ 257,491	\$ 71,377	\$ 33,281,665

CANARIE Inc.
Statement of Cash Flows

For the year ended March 31	2024	2023
Cash flows from operating activities		
Excess of revenues over expenses	\$ 655,962	\$ 415,744
Items not affecting cash:		
Amortization expense	3,454,179	2,982,793
Amortization of deferred capital funding	(3,454,179)	(2,982,793)
Gain on disposal of tangible capital assets	(90)	(210)
	<u>655,872</u>	<u>415,534</u>
Changes in non-cash working capital:		
Accounts and other receivable	(1,185,150)	(12,340)
Prepaid expenses and deposits	(5,570,929)	125,427
Accounts payable and accrued liabilities	(1,855,999)	526,440
Deferred revenue	(37,500)	62,126
Deferred funding	(5,825,768)	7,230,238
	<u>(13,819,474)</u>	<u>8,347,425</u>
Cash flows from investing activities		
Deferred capital funding received to purchase tangible		
and intangible capital assets	11,888,107	2,481,960
Acquisition of tangible capital assets and intangible		
asset	(11,888,107)	(2,481,960)
Proceeds on disposal of tangible capital assets	90	210
Purchase of investments	(29,619,981)	(36,596,890)
Proceeds from disposal of investments	53,039,180	28,000,000
	<u>23,419,289</u>	<u>(8,596,680)</u>
Cash flows from financing activities		
Repayment of obligations under capital leases	(679,249)	(222,114)
Deferred capital funding received related to the		
payment of obligations under capital leases	679,249	222,114
	<u>-</u>	<u>-</u>
Net increase (decrease) in cash	9,599,815	(249,255)
Cash, beginning of the year	2,459,680	2,708,935
Cash, end of the year	\$ 12,059,495	\$ 2,459,680

The notes are an integral part of these financial statements.

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

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.

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

1. Significant Accounting Policies (continued)

Revenue Recognition CANARIE Inc. (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 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.

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

1. Significant Accounting Policies (continued)

Tangible Capital Assets and Intangible Asset	<p>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:</p> <table><tr><td>Computer equipment</td><td>3 years straight-line basis</td></tr><tr><td>Equipment</td><td>3 years straight-line basis</td></tr><tr><td>Leasehold improvements</td><td>over the term of the lease</td></tr><tr><td>Furniture</td><td>5 years straight-line basis</td></tr><tr><td>Network equipment</td><td>5 years straight-line basis</td></tr><tr><td>Computer software</td><td>2 years straight-line basis</td></tr></table>	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
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	<p>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.</p>												
Leases	<p>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.</p> <p>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.</p>												
Contributed Services	<p>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.</p>												
Presentation of Expenses	<p>Activities eligible for funding in the ISED contribution agreement are classified as program or operating 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 ISED contribution agreement are classified as corporate expenses or Research Intensive Group expenses.</p>												

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

2. Accounts and Other Receivables

	<u>2024</u>	<u>2023</u>
Trade account receivables	\$ 340,598	\$ 360,476
Government remittances receivable	1,566,900	361,872
	<u>\$ 1,907,498</u>	<u>\$ 722,348</u>

3. Prepaid Expenses and Deposits

	<u>2024</u>	<u>2023</u>
Program prepayments and deposits	\$15,876,996	\$10,382,185
Operating prepayments	402,679	326,561
Lease deposits	36,500	36,500
	<u>16,316,175</u>	<u>10,745,246</u>
Balance, end of the year	16,316,175	10,745,246
Current portion	<u>8,121,219</u>	<u>5,400,420</u>
Long-term portion	<u>\$ 8,194,956</u>	<u>\$ 5,344,826</u>

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

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

	2024		2023	
	Cost	Accumulated Amortization	Cost	Accumulated Amortization
Computer equipment	\$ 1,248,433	\$ 873,072	\$ 1,193,011	\$ 724,079
Equipment	381,485	349,925	366,152	290,629
Leasehold improvements	902,936	673,629	902,936	437,487
Furniture	247,365	172,810	247,365	123,337
Art	4,082	-	2,139	-
Network equipment	25,032,227	17,594,473	20,123,680	15,704,165
Fibre under capital lease	15,505,114	7,153,691	15,505,114	6,185,646
Fibre under capital lease under construction	6,772,933	-	-	-
Computer software	443,990	388,719	364,739	341,476
	\$50,538,565	\$ 27,206,319	\$38,705,136	\$ 23,806,819
Net book value		\$ 23,332,246		\$ 14,898,317

During the year, computer equipment with a cost of \$54,679 (2023 - \$81,833) and accumulated amortization of \$54,679 (2023 - \$81,833) was disposed and removed from the total cost and total accumulated amortization.

During the year, the organization acquired fibre under capital lease with a cost of \$6,772,933 (2023 - \$Nil).

5. Accounts Payable and Accrued Liabilities

	2024	2023
Accounts payable and accrued liabilities	\$ 2,796,749	\$ 4,650,498
Government remittances payable	-	2,250
	\$ 2,796,749	\$ 4,652,748

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

6. Deferred Funding

Pursuant to Funding Agreements signed on July 6, 2019, October 9, 2015, September 4, 2012, and March 28, 2007, the organization received funding of \$137,000,000, \$113,658,824, \$62,000,000 and \$120,000,000 respectively from Innovation, Science and Economic Development Canada (ISED) for the design, development, deployment, improvement and operations of the CANARIE network and programs. In 2024, the organization received funding of \$1,300,000 (2023 - \$1,400,000) from the Research Intensive Group (RIG) to support early-stage research and development for the Research & Education sector cybersecurity tools and services.

The balance of the funds has been reflected as follows:

	<u>2024</u>	<u>2023</u>
Balance, beginning of year	\$24,135,657	\$16,905,419
ISED funding received	40,600,000	37,500,000
RIG funding received	1,300,000	1,400,000
Program - service fees	583,719	685,923
Program - interest	1,126,773	575,884
Direct program and operating expenses	(35,994,214)	(29,970,004)
RIG expenses	(874,689)	(257,491)
Transfer to operating for the acquisition of tangible capital assets, assets under capital lease and intangible asset	(11,888,108)	(2,481,960)
Transfer to operating for payments of obligations under capital lease	(679,249)	(222,114)
	<u>18,309,889</u>	<u>24,135,657</u>
Balance, end of year	18,309,889	24,135,657
Current portion	10,114,933	18,790,831
	<u>\$ 8,194,956</u>	<u>\$ 5,344,826</u>
Long-term portion		

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

7. Deferred Capital Funding

Deferred capital contributions represent amounts funded by 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:

	<u>2024</u>	<u>2023</u>
Balance, beginning of year	\$10,645,119	\$10,923,838
Funding received related to the acquisition of tangible capital assets, assets under capital lease and intangible asset	11,888,108	2,481,960
Funding received related to the payment of obligations under capital leases	679,249	222,114
Amortization of program and operating assets	<u>(3,454,179)</u>	<u>(2,982,793)</u>
Balance, end of year	<u>\$19,758,297</u>	<u>\$10,645,119</u>

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

8. Obligations Under Capital Leases

	2024	2023
Capital lease for infeasible rights of use of fibre, renewed, 3.00%, due March 2032, payable by monthly installments of \$23,825, principal and interest.	\$ 1,805,588	\$ 2,034,366
Capital lease for infeasible rights of use of fibre, 3.83%, due April 2025, payable by 3 installments of \$201,870, \$278,646 and \$1,985,636, principal and interest.	1,768,361	2,218,832
	3,573,949	4,253,198
Less: current portion	2,004,002	709,293
	\$ 1,569,947	\$ 3,543,905

Minimum lease payments required under the capital lease are as follows:

2025	\$ 2,271,535
2026	285,898
2027	285,898
2028	285,898
2029	285,898
Subsequently	571,797
	3,986,924
Less: interest included in minimum payments	(412,975)
	\$ 3,573,949

9. Commitments

On November 20, 2019, the organization entered into a lease agreement for an office space commencing on April 1, 2020, which expires March 31, 2025. Future minimum annual lease payments (which includes base rent and the current charge for additional rent) of \$595,860 are due in 2025.

As at March 31, 2024, the organization had commitments of \$8,555,391 with respect to its programs.

CANARIE Inc.
Notes to Financial Statements

March 31, 2024

10. Internally Restricted Net Assets

Royalty Fund

During the 2007/2008 fiscal year, Industry Canada granted the organization the authority to retain royalties collected after March 31, 2007 and to use these funds in a manner to be determined by the organization and its legal counsel. Annual allocations to the fund include investment income of \$103,707 (2023 - \$42,463). 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, the organization 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 cover outstanding operating expenses and obligations should a wind up or transition occur. Management performs an annual review of the sufficiency of this fund. Annual allocations to the fund include investment income of \$243,802 (2023 - \$94,750). At March 31, 2024, the organization transferred \$300,000 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 July 6, 2019, ISED entered into a contribution agreement with the organization to contribute funding totalling \$137,000,000 from April 1, 2020 to March 31, 2024. Of the total contribution, \$30,200,000 was received in fiscal 2021, \$28,700,000 was received in fiscal 2022, \$37,500,000 was received in fiscal 2023, and \$40,600,000 was received in fiscal 2024. The contribution agreement was amended on March 22, 2024 and increased the total funding to \$174,000,000 with an end date of March 31, 2025.

12. Financial Instruments

Credit risk

The organization is exposed to credit risk since all of its bank accounts are held in one financial institution.