



OPEN SMART CITY INITIATIVES AS TOOLS FOR INDIGENOUS DATA SOVEREIGNTY

COMMUNITY SOLUTIONS NETWORK
RESEARCH BRIEF

DECEMBER 2021

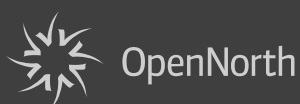
THE FIRELIGHT GROUP



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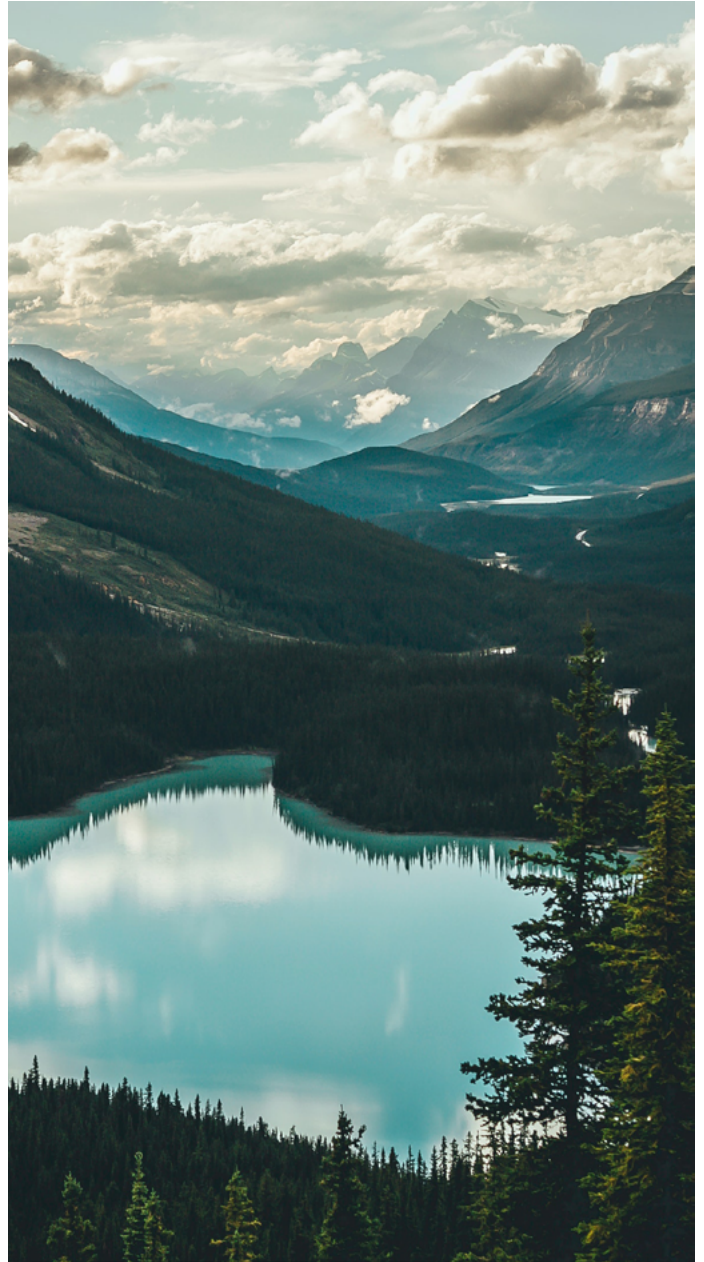
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Executive Summary

This brief considers key policy components that any Open Smart Community initiatives would need to incorporate and implement into infrastructure design and procedures to protect Indigenous data sovereignty (IDS). The Open Data Charter states: “Open data is digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere” (Open Data Charter, n.d.). However, the Open Data Charter did not involve Indigenous peoples or perspectives when it was developed, and so the goals of universal open data access are in direct conflict with the rights of Indigenous people to govern and steward their own data (Rainie et al., 2019). While Open Smart Community initiatives call for all sectors and citizens to contribute and mobilize such data to inform transparent decision making, IDS challenges these ideals, whereby Indigenous communities have the right to determine what data they would like to share with settler institutions or keep confidential to the community. This brief also considers the opportunities that Open Smart Community initiatives can present for Indigenous communities and governance bodies, by creating and mobilizing their own data through streamlined data collection infrastructure, to inform governance and stewardship decisions for their lands, resources, rights, interests, and membership’s needs and wellbeing.

About the Firelight Group

Founded in 2009 under the principles of quality, fairness, respect, and social return, the Firelight Group aims to provide services specifically tailored to supporting the rights and interests of Indigenous and local communities in Canada and beyond. Firelight’s mission is to support high-quality research, analysis, and technical tools to create solutions for our shared futures, particularly for Indigenous clients.



Note: OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC) and can be further explored at [FNIGC's website](#).

Foreword

by Open North

Open North pursued the development of this research brief, as we recognize that our team and the policy makers we work with have much to learn from Indigenous communities and Indigenous-led projects so that we can act in solidarity and be part of removing systemic barriers to Indigenous data sovereignty (IDS) and self-determination.

As communities across the country explore Open Smart Community initiatives, there is a pressing need to better understand the opportunities and risks presented by data and emerging technologies and put Open Smart Community principles into practice. Open North has commissioned a series of research briefs for policy makers and practitioners to provide insight into how data and technology intersect with the challenges local communities are grappling with.

First defined in 2018 by Lauriault, Bloom and Landry, an Open Smart Community (OSC) is one where all actors, including residents, collaborate in mobilizing data and technologies to develop their community through fair, ethical, and transparent governance that balances economic development, social progress, and environmental responsibility.

We know that Indigenous data is largely not held or possessed by the Indigenous nations and peoples it represents. As an organization that focuses on data sharing and Open Smart Communities, we have much to learn to ensure that the First Nations Principles of OCAP® (ownership, control, access, and possession) set forth by the First Nations Information Governance Centre (n.d.) and the interests of Indigenous communities are upheld in OSC initiatives.

This research brief highlights IDS as a key concept in Open Smart Communities and data sharing. The brief outlines key considerations for local governments seeking to work with Indigenous communities on Open Smart Community initiatives and provides recommendations for approaching the work in a way that builds long-term relationships and upholds Indigenous sovereignty.

We thank the authors of this brief from the Firelight Group. Open North continues to learn from and value the ongoing

collaboration between staff in our organizations. We look forward to continuing to develop our working relationship as we address issues of data sovereignty and the interactions between Indigenous communities and Open Smart Community initiatives.

Acknowledgements

The research builds on the Open Smart Cities Guide, which provided the first ever definition of an Open Smart City. It was published in 2018 as a part of a year long collaborative research project led by Open North and funded by Natural Resources Canada's GeoConnections program in 2018. The authors are Dr. Tracey P. Lauriault (Carleton University), Rachel Bloom (Open North) and Jean-Noé Landry (Open North).

These research briefs are produced for the Community Solutions Network, a community-centric platform for communities to connect and build a national centre of excellence in open smart cities. As the project lead, Evergreen is working with lead technical partner Open North and other partners to provide valuable information, learning opportunities, advisory and capacity building services to Canadian communities in key areas of data and technology, helping to improve the lives of residents.

We offer—at no cost to communities—a comprehensive Advisory Service for Canadian communities interested in developing and implementing open smart cities projects. To learn more about the Advisory Service, please visit communitysolutionsnetwork.ca.

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Foreword: Megan Wylie

Graphic design: Tatev Yesayan

Definitions

Indigenous Data

*"... data in a wide variety of formats inclusive of digital data and data as knowledge and information. It encompasses data, information, and knowledge about Indigenous individuals, collectives, entities, lifeways, cultures, lands, and resources."*¹

It is crucial for non-Indigenous peoples and institutions to understand that Indigenous data comprises much more than simply numbers and spreadsheets containing information about Indigenous peoples. Leading Indigenous data scholars have aptly defined and contextualized it as follows:

*"Indigenous peoples 'have always been data creators, data users, and data stewards. Data were and are embedded in Indigenous instructional practices and cultural principles' (NCAI 2018, p. 1). For example, many Indigenous knowledge systems were based on generations of data gathering through observation and experience that then informed Indigenous practices, protocols, and ways of interacting with other people and with the natural world. The translation of knowledge into data was similarly evident. Indigenous data were recorded in oral histories, stories, winter counts, calendar sticks, totem poles, and other instruments that stored information for the benefit of the entire community (Rodriguez-Lonebear 2016)... We consider Indigenous data to be 'any facts, knowledge, or information about a Native nation and its tribal citizens, lands, resources, cultures, and communities. Information ranging from demographic profiles, to educational attainment rates, maps of sacred lands, songs, and social media activities,' (Rainie et al. 2017b, p. 1), among others. Indigenous data comprise information and knowledge about our environments, tribal citizens and community members, and our cultures, communities, and interests (Nickerson 2017). The definition encompasses both collective and individual level data."*²

1 Rainie et al., 2019

2 Carroll et al., 2019

Indigenous Data Sovereignty (IDS)

*"Indigenous data sovereignty asserts **the rights** of Native nations and Indigenous Peoples to govern the collection, ownership, and application of their own data."*³

Further, every Indigenous community may define how these rights are asserted,⁴ based on culturally rooted "traditions, roles, and responsibilities for the use of collectively held information."⁵

Indigenous Data Governance

The **systems and mechanisms** in place to exercise the rights of Indigenous data sovereignty.⁶

OCAP®

The First Nations Information Governance Centre created a national strategy in Canada to protect Indigenous data sovereignty (IDS), called the First Nations Principles of OCAP®, defined as follows:

"OCAP® asserts that First Nations alone have control over data collection processes in their communities, and that they own and control how this information can be stored, interpreted, used, or shared.

Ownership refers to the relationship of First Nations to their cultural knowledge, data, and information. This principle states that a community or group owns information collectively in the same way that an individual owns his or her personal information.

Control affirms that First Nations, their communities, and representative bodies are within their rights in seeking to control over all aspects of research and information

3 Carroll & Martinez, 2019, emphasis added

4 Open North & British Columbia First Nations Data Governance Initiative, 2017

5 Rainie et al., 2019

6 Rainie et al., 2017a

management processes that impact them. First Nations control of research can include all stages of a particular research project—from start to finish. The principle extends to the control of resources and review processes, the planning process, management of the information and so on.

Access refers to the fact that First Nations must have access to information and data about themselves and their communities regardless of where it is held. The principle of access also refers to the right of First Nations' communities and organizations to manage and make decisions regarding access to their collective information. This may be achieved, in practice, through standardized, formal protocols.

Possession While ownership identifies the relationship between a people and their information in principle, possession or stewardship is more concrete: it refers to the physical control of data. Possession is the mechanism by which ownership can be asserted and protected.⁷

OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC). You can read more about this on the [FNIGC website](#).

CARE Principles

The CARE Principles for Indigenous Data Governance is another framework put together by the Global Indigenous Data Alliance, which emphasizes the “right to create value from Indigenous data in ways that are grounded in Indigenous worldviews and realise opportunities within the knowledge economy” while being “people and purpose-oriented, reflecting the crucial role of data in advancing Indigenous innovation and self-determination.”⁸ The Principles are:

7 First Nations Information Governance Centre, n.d.

8 Research Data Alliance International Indigenous Data Sovereignty Interest Group, 2019

Collective Benefit: “Data ecosystems shall be designed and function in ways that enable Indigenous Peoples to derive benefit from the data.” This includes “for inclusive development and innovation, for improved governance and citizen engagement, and for equitable outcomes.”⁹

Authority to Control: “Indigenous Peoples’ rights and interests in Indigenous data must be recognised and their authority to control such data be empowered. Indigenous data governance enables Indigenous Peoples and governing bodies to determine how Indigenous Peoples, as well as Indigenous lands, territories, resources, knowledges and geographical indicators, are represented and identified within data.”¹⁰

Responsibility: “Those working with Indigenous data have a responsibility to share how those data are used to support Indigenous Peoples’ self-determination and collective benefit. Accountability requires meaningful and openly available evidence of these efforts and the benefits accruing to Indigenous Peoples.”¹¹

Ethics: “Indigenous Peoples’ rights and wellbeing should be the primary concern at all stages of the data life cycle and across the data ecosystem.”¹²

Open Smart City

“A city where all sectors, including residents, collaborate in mobilizing data and technologies to develop their community through fair, ethical, and transparent governance that balances economic development, social progress, and environmental responsibility.”¹³

9 Research Data Alliance International Indigenous Data Sovereignty Interest Group, 2019

10 Research Data Alliance International Indigenous Data Sovereignty Interest Group, 2019

11 Research Data Alliance International Indigenous Data Sovereignty Interest Group, 2019

12 Research Data Alliance International Indigenous Data Sovereignty Interest Group, 2019

13 Lauriault et al., 2018

Key Considerations for OSC Initiatives in Indigenous Communities

In this section we cover key considerations that any OSC initiatives should account for, given the risks and barriers that Indigenous communities have been burdened with historically when it comes to creating, accessing, using, and stewarding their own data.

Protecting Indigenous Data Sovereignty

It has been well documented that historically, Indigenous peoples' data has repeatedly been collected, used, and harmfully represented often without informed consent or prior input from the Indigenous communities or individuals. Such data have subsequently been used by external organizations or individuals for their own purposes.¹⁴ This has resulted in irrelevant or biased data sets that do not meet the needs or priorities of Indigenous communities, and can:

- result in poorly informed or even harmful policy decisions,
- exacerbate stigmatization and marginalization of Indigenous peoples,
- prevent meaningful progress for Indigenous communities' goals, and
- lead to the disclosure of confidential or sensitive data and undermine their self-sovereignty.¹⁵

¹⁴ Dewar, 2019; McMahon et al., 2015; Rainie et al., 2019

¹⁵ Rainie et al., 2019

Thus, settler institutions cannot expect to freely extract, access, use, or represent Indigenous communities' data unless expressly permitted to, even under the tenets of open data principles. An OSC initiative could pose the risk of causing these exact harms again by infringing on the rights to Indigenous data sovereignty (IDS), unless intentionally built on foundations of protecting IDS.

Any OSC initiative that aims to meaningfully include and/or provide services to Indigenous communities must have ways to always protect IDS, which means involving an Indigenous community right at the beginning of designing a potential OSC project.

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Community-Driven Data Content

OSC initiatives must be driven by community needs, so that all data created is culturally relevant, supports their sovereignty, and respects the privacy, protocols, dignity, and individual and collective rights of an Indigenous community.¹⁶

“The utility of... data sets... is bound by the questions that were used to collect the data. A data set only includes information that the developers of the data collection tool deemed important... This limits what the data can be used for.”¹⁷

This necessarily connects to the concepts of participatory design and participatory action research. Participatory design requires the participation of stakeholders—especially users, developers, and planners—to “cooperatively make or adjust systems, technologies, and artefacts in ways which fit more appropriately to the needs of those who are going to use them.”¹⁸ Participatory action research is “a framework for conducting research and generating knowledge centered on the belief that those who are most impacted by research should be the ones taking the lead in framing the questions, the design, methods, and the modes of analysis of such research projects.”¹⁹ The framework works to value both historically “recognized” knowledge, such as university-based knowledge

generation, and historically “de-legitimized” knowledge, such as knowledge from marginalized communities.²⁰ These frameworks can be used to understand community-driven data content.

To develop OSC initiatives that are driven by community needs, understandings of the issues need to be surveyed and defined by the community. This will help determine community-specific questions, indicators, and measurements that must be incorporated into the design of OSC initiatives and data collection tools from the start, to ensure that the resulting data will be culturally relevant and contain the necessary elements. This will also help ensure that subsequent data collected is valuable and useful for long-term monitoring of the indicators.²¹

Historically, Indigenous communities have been excluded from providing input regarding how and which of their data is collected, used, and presented; at the same time, Western science and data extraction have been used as tools by government agencies to justify and sustain processes of colonization and racist policies of subjugation against Indigenous communities.²² As a result, many Indigenous people justifiably do not trust data collection processes and are wary of participating or sharing their data, affecting the overall quality of the data.²³

16 Schnarch, 2004

17 McBride, n.d.

18 Bannon & Ehn, 2012

19 Carleton College Center for Community and Civic Engagement, n.d.

20 Carleton College Center for Community and Civic Engagement, n.d.

21 McBride, n.d.

22 McBride, n.d.

23 McBride, n.d.; Steffler, 2016

“OSC initiatives must be driven by community needs, so that all data created is culturally relevant, supports their sovereignty, and respects the privacy, protocols, dignity, and individual and collective rights of an Indigenous community .”

Data Jurisdiction

OSC initiatives should ensure that all data coming from Indigenous communities is available to them in useful subsets that cover their community, and that can easily be utilized for their own decision-making processes.

If an OSC initiative were proposed for a large region including multiple Indigenous and non-Indigenous communities, the proponent should engage with Indigenous communities early in the planning process to identify how the communities would like their data to be used, separated, processed, and repatriated, so that it can be returned in formats that are useful for them. This can include ensuring that Indigenous communities' resulting data sets are geographically relevant for them, and contain relevant indicators and measurements so that the data can be incorporated into a community's existing data management system. The data sets can then also more easily contribute to a community's own decision-making processes.

Where a proponent is handling data from or for multiple communities, there may be a need to build additional time into projects to ensure that each community's data can be adequately separated and processed into formats that are usable for them before repatriation of the data. Each community may have varying perspectives and requirements for how

If an OSC initiative were proposed for a large region including multiple Indigenous and non-Indigenous communities, the proponent should engage with Indigenous communities early in the planning process to identify how the communities would like their data to be used, separated, processed, and repatriated, so that it can be returned in formats that are useful for them.

this is done, based on their unique cultural contexts and needs; proponents will need to clarify each community's preferences.

A challenge that many communities currently face is that they experience delays when trying to access and consolidate their data from across many different sources; the data may come from varying geographic jurisdictions and each data set could measure variables differently, making it difficult to compare or analyze data across different sets.²⁴

Building Robust Community Resources and Capacity for Data Creation, Storage, and Access

Many Indigenous communities' governance bodies do not have adequate resources—time, capacity, staffing, and infrastructure—to develop and implement their own data agendas. Nations likely have many urgent needs their staff are working through, and frontline community care often must be prioritized over data projects.²⁵ Additionally, there may be a need to build cohesive data and tech literacy within a nation's staff, depending on their roles. Limits on human resources, combined with the time-consuming tasks of accessing high-quality data that is relevant and being able to access and compare multi-jurisdictional data, mean a nation's leadership may not have comprehensive views of available data in a timely manner to help with decision making.²⁶

Any OSC initiative should incorporate capacity building and skills sharing for the community it is proposed for. This includes ensuring that the community's staff or membership develop internal capacity and knowledge on how any related data collection tools work; how to leverage the resulting data sets for various departments' needs; and how the OSC initiative will fit into internal data management structures. This creates opportunities for individuals in a community to develop useful data literacy, research, and data governance skills, and the nation can ultimately regain control over how their community's data is created, stored, accessed, and used.²⁷

24 McBride, n.d.

25 McBride, n.d.

26 McBride, n.d.; Schultz & Rainie, 2014

27 Schnarch, 2004

Case Study: Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut

Developed by the Nunavut Association of Municipalities, Pinnguaq, the Embrace Life Council, and Qaujigiartiit Health Research Centre, the proposal for Katinnganiq won \$10 million as a finalist in the Smart Cities Challenge. Katinnganiq is focused on implementing protective and preventive measures to reduce the risk of suicide in Nunavut by creating a decentralized and community-based digital health and wellness platform.²⁸ This platform will include both digital and physical spaces, and will increase the availability and accessibility of mental health resources and support systems (e.g., peer-to-peer networks, educational initiatives), culturally relevant creative programming, (e.g., an Inuktitut-based digital literacy curriculum, teaching traditional cultural skills, Elder mentoring, art therapy), and improved and innovative digital and physical infrastructure (e.g., mobile applications, gamified interventions, and permanent maker-spaces—community workshop and gathering places to share, learn, create, experiment, play, and have fun, emphasizing healthy living that integrates Inuit culture, knowledge, and technology).²⁹

In this way, Katinnganiq aims to develop innovative, engaging, and culturally relevant mental health and wellness tools for the Nunavummiut, while also using technology to leverage connectivity, resource sharing, and digital literacy within and across all 25 hamlets to collectively tackle the challenge of suicide prevention in Nunavut.

²⁸ Infrastructure Canada, 2018

²⁹ Pinnguaq et al., n.d.

Implementing OCAP®

When developing any OSC initiative that will generate or rely upon Indigenous peoples' data, the OCAP® Principles must be considered. Indigenous people and communities must have control over how their data is used, interpreted, stored, and shared.³⁰

Ownership: OSC data sets containing data from and about Indigenous peoples are owned by the Indigenous people themselves, or their community. If an OSC initiative is run by an Indigenous community, the data sets might be collectively owned according to a nation's protocols. If an OSC initiative is run by a non-Indigenous institution, Indigenous data is still fully owned by the individual or community; an outside institution should not assume ownership of any contributing Indigenous data.

Control: Indigenous communities and individuals must have control over how OSC initiatives are designed, so that they produce data that is relevant for decision making; they must also have control over how their resulting data is used.

Access: OSC data sets must be made accessible to Indigenous communities and individuals in a timely manner, and in formats that are easily usable.

Possession: OSC data sets must be held in repositories that serve the best interests of an Indigenous community. Nations may choose to physically hold their data on servers within their own land/council offices or may elect to have a third party hold their data for storage.

³⁰ First Nations Information Governance Centre, n.d.

Recommendations

Contribute to Nation “Rebuilding”

“Data sovereignty, data governance, and nation rebuilding go hand in hand.”³¹

Numerous Indigenous data scholars have summarized that a crucial component of Indigenous nation “rebuilding” and self-determination is the ability to regain control over their knowledge.³²

By establishing culturally relevant resources, skills, and data collection tools to support internal management of community data, Indigenous communities ultimately build their capacity to provide themselves with accurate, relevant, and timely data to guide evidence-based decision making.³³ In the best-case scenario, OSC initiatives might even create opportunities to automate decision making for Indigenous nations, and alleviate workloads on often-overburdened and under-resourced staff.

OSC initiatives could be a useful tool to add to the toolbox of nation “rebuilding,” whereby a nation could have a more transparent, accurate, and timely view of the needs within their community and territories, thus supporting quicker and stronger decision making, in a way that reflects their own culture³⁴ and supports their own staff and citizens.

31 Rainie et al., 2017a

32 Carroll & Martinez, 2019; Carroll et al., 2019; Dewar, 2019; First Nations Information Governance Centre, n.d.; McMahon et al., 2015; National Congress of American Indians, 2018; Rainie et al., 2019; Rainie et al., 2017a; Rainie et al., 2017b; Schnarch, 2004; Schultz & Rainie, 2014; Walter et al., 2021

33 McMahon et al., 2015; Rainie et al., 2017a

34 McMahon et al., 2015

Case Study: Imappivut

Imappivut—meaning “Our Oceans”—is a marine plan by the Nunatsiavut Government. The plan aims to ensure that Nunatsiavut waters are managed and protected with Labrador Inuit interests prioritized in decision making. Imappivut aims to have Nunatsiavut communities be involved in decisions that affect them and their relationship with coastal and marine areas.

Inuit Labrador traditional, local, and scientific knowledge will be gathered and relied upon so that the marine plan can be developed to represent Labrador Inuit interests and priorities. Thus, Imappivut can identify research, monitoring, and stewardship activities that will address community priorities.³⁵

Imappivut is an initiative where the communities’ needs are at the forefront, and their own knowledge and data feed back into their own decision-making processes, and ultimately, self-determination over their own lands.

35 Nunatsiavut Government, n.d.

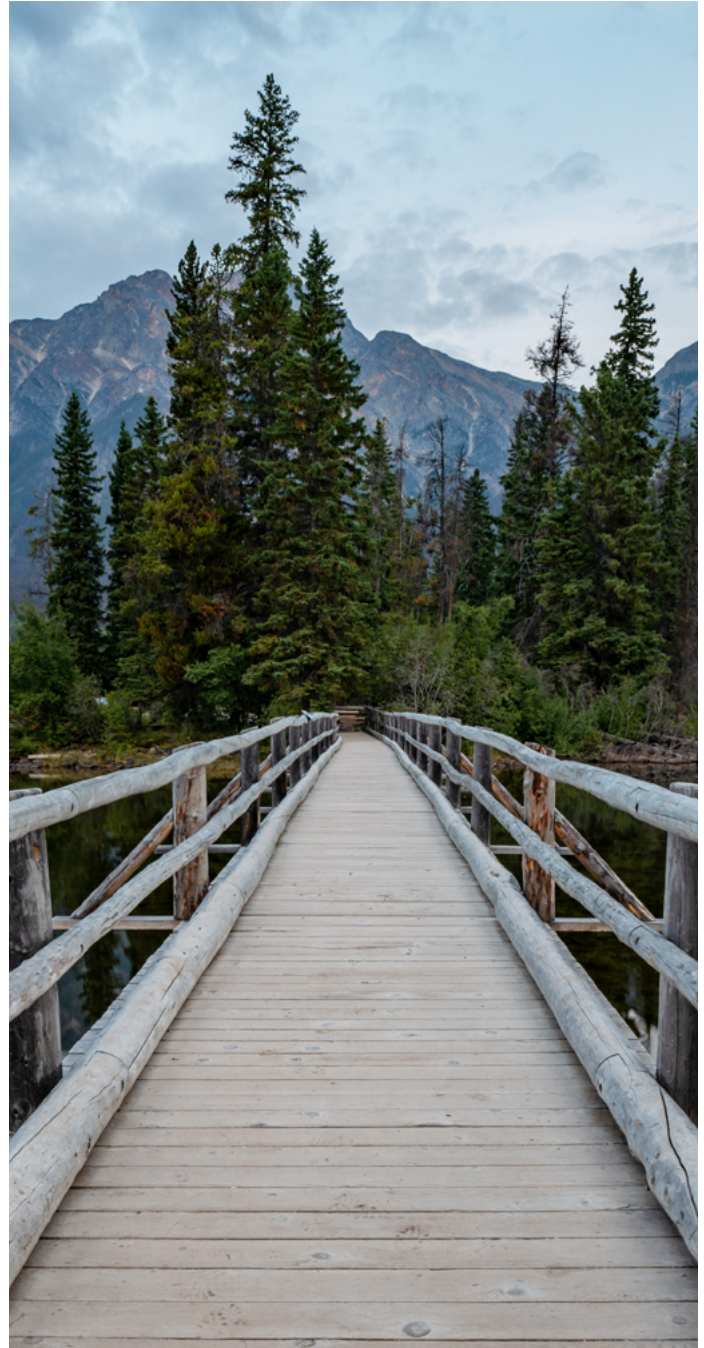


Development of Suitable Data Management Infrastructure, around the OCAP® Principles

In ways that follow the OCAP® Principles, OSC initiatives could provide opportunities to build the technical infrastructures, social relationships, policies and procedures, and human resource capacities and roles needed to support community data management.³⁶

Depending on the needs of any OSC initiative an Indigenous community or organization is looking to pursue, the following infrastructure requirements may need to be addressed and put in place:

- Data management capacity training for staff
- Adequate digital and telecommunications infrastructure, including physical networks, high-speed internet connectivity, adequate devices, and software
- Data governance tools:
 - Social infrastructure that outlines the rights and responsibilities of anyone who has the responsibility to access and use the data. This could include developing data sharing agreements, and privacy and security policies.³⁷
 - Clear policies to guide staff with data management procedures, and clear guidelines regarding open and/or restricted data sharing.
 - Data governance mechanisms that non-tribal governments, organizations, corporations, and researchers can use to support tribal data sovereignty.³⁸
 - Clear outreach materials developed so that if an OSC initiative requires community members to willingly contribute data on an ongoing basis (e.g., land-based monitoring data collection), community members will know who owns the data, how their data privacy is being protected, and how the data will be used to inform governance and stewardship for their community's interests. This can help build members' trust in the data collection process.
 - Regular meetings between data users to discuss gaps and/or overlaps in how data is used, how it aids decision making and delivery of services, and ways to streamline and pool resources and costs.³⁹



36 McMahan et al., 2015

37 McMahan et al., 2015

38 Rainie et al., 2017a

39 McMahan et al., 2015

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