



# Embedding Resilience and Reconciliation: A Tool for Open Public Spaces

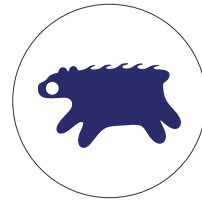


An approach to evaluating open public spaces, embedding principles of Truth and Reconciliation, enhancing climate resilience, and supporting community wellbeing.

Supported by:



# Acknowledgements



## Acknowledgement of Indigenous Lands and Treaties Across Canada

The sacred lands and waterways upon which Evergreen operates and the built communities and cities across the country, are the traditional territories, homelands and nunangat of the respective First Nations, Métis Nations and Inuit who are the long-time stewards of these lands. These lands are occupied lands and subject to inherent rights, covenants, treaties and self-government agreements that guide non-Indigenous peoples towards respectful and responsible co-existence and land relationships across Turtle Island. These regions are still home to diverse Indigenous Peoples, who are still fighting for their sovereign rights and tirelessly protecting their traditional territories. As uninvited guests who live and work on these lands, we have a responsibility to know the treaties that tie us together, advocate for Indigenous rights and commit to learning our responsibilities to each other.

## Acknowledgements

We believe that collaboration is the key to building great public places, community and connection.

The Embedding Resilience and Reconciliation Tool was created by Dark Matter Labs and produced by Evergreen. Evergreen is a national non-profit transforming public spaces in our cities to build a healthier future for people and our planet. [Dark Matter Laboratories \(DML\)](#) is a strategic discovery, design, and

development lab that collaborates with global partners to create the institutional infrastructure needed for society's transition in response to technological advances and climate crisis. This tool was developed through a collaboration between the [TreesAI](#) (Trees as Infrastructure) team and [7GenCities](#) team within DML.

**TreesAI** is an initiative within DML focused on advancing the implementation and long-term stewardship of urban Nature-based Solutions (NbS) through spatial tools and data-driven innovation. TreesAI's mission is to shift the perception of nature from a liability to an asset, unlocking the collective investment required to sustain NbS at scale. **7GenCities** is an open collective fostering transformative thinking and action, especially toward building collaborations and demonstrations of future city and community building and bioregional stewardship, and transitioning a diversity of infrastructures (social, civic, green, financial and legal). We are working with Indigenous, civic and municipal leaders, Knowledge Keepers and students in communities and urban regions across Canada.

The tool was written by Tanya Chung-Tiam-Fook (Indigenous Director and co-holder of 7GenCities with Evergreen and Mi'kmaq Native Friendship Centre) and Sofia Valentini (Dark Matter Labs/ TreesAI), with project advising from Sebastian Klemm (Dark Matter Labs/TreesAI). The tool was created with support from the Evergreen team including Dicle Han, Angela Parillo, Joshua Welch, Alison Herr, Cheryl Gudz and Kelly Mai. We are beyond grateful

to our Indigenous reviewers from across the country for sharing their brilliant insights and incredible support of this tool and its wider vision to expand possibilities and pathways for Indigenous inclusive and co-governed public open spaces. Our reviewers include Pam Glode-Desrochers (Innu, Mi'kmaw Native Friendship Centre), Rhode Thomas (Kanien'kehá:ka, Robinson-Huron Waawiindamaagewin Treaty Team), Gary Wilson (Hítzaqv, Tiičma), Laura McPhie (Anishinaabekwe, Evergreen Advisor), Delanie Passer (Nêhiyaw, Wapi Kihew), Mary Jenkins (Nêhiyaw, Písim), and Michael Vegh (Hítzaqv, Heiltsuk Tribal Council). Tsista Kennedy's beautiful and spirited artwork is also included throughout the tool.

This tool builds from the Public Space Inventory (Step 1) by Dark Matter Labs to better understand how each open public space performs in relation to climate resilience, community wellbeing and embedding Truth and Reconciliation - and in comparison with other public spaces in the neighbourhood or city. This tool will provide tool administrators with a better understanding of open public spaces that require additional attention for climate-resilient interventions to strengthen the network of public spaces they design, steward, maintain, and/or utilize. Much like the creation, update and improvement of Public Space Inventories on a regular basis, public spaces can be evaluated on an ongoing schedule.

### About the Authors

**Tanya Chung-Tiam-Fook**, PhD is deeply engaged in Indigenous, regenerative, relational, complexity, and transdisciplinary + trans-systemic approaches to education and research, land stewardship and climate resilience, systems change and innovation, placekeeping, healing justice and mental wellness. Her Akawaio-Kapon and mixed ancestry from Guyana and the Netherlands, combined with experiences across cultures, ecologies and

geographies, enable her to bring multifaceted perspectives and sensibilities to her work that are both place-based and global. Tanya is co-founder of 7GenCities and co-holds the initiative with Evergreen and the Mi'kmaq Native Friendship Centre; advisor for numerous philanthropy, non-profit and government entities; and writer and part-time lecturer in environmental, Indigenous and urban studies. She is also co-editor and co-author of *Sacred Civics: Building Seven Generation Cities* with Jayne Engle and Julian Agyeman and many authors, and she wrote both the *Civic-Indigenous Toolkit for Partnership Building and Placekeeping* (with Evergreen) and *Championing Indigenous Inclusion and Leadership: A Guide for Tech and Innovation*.

**Sofia Valentini** holds a bachelor's degree in Architecture and a master's degree in Metropolitan Analysis, Design, and Engineering with expertise in data analysis, sustainability, and spatial strategies. Her work at Dark Matter Labs, particularly with the Trees AI initiative, emphasizes integrating nature-based solutions into urban resilience planning. Sofia approaches her work with a focus on inclusive, data-driven solutions that prioritize both environmental health and community well-being. She acknowledges the need for urban solutions to be socially just and aims to ensure that climate resilience strategies reflect diverse community needs while leveraging innovative technologies.



# What This Tool Contains



The Embedding Resilience and Reconciliation Tool is designed to be easy to implement, with many of the necessary resources already included. To help you effectively plan and carry out the assessment, the tool provides the following:

## **Implementation Guides**

Step-by-step instructions to guide open space stewards through the implementation process.

## **Linking Criteria to SDGs**

A table that links each evaluation criterion to the relevant Sustainable Development Goals (SDGs), ensuring alignment with global sustainability standards.

## **Survey Templates**

Pre-built questionnaire templates with multi-faceted questions covering various criteria used in the evaluation process. Tool administrators are encouraged to modify these questionnaires as needed to reflect their specific climate, ecological and community contexts.

## **Embedding Reconciliation Questions**

The tool includes a set of aspirational Truth and Reconciliation questions that are integrated into each evaluation aspect, ensuring that Indigenous knowledges, design and placekeeping practices, and actioning Truth and Reconciliation are considered throughout the assessment.

## **Quantitative & Qualitative Methods for Evaluation**

This section demonstrates how to set up the scoring tables and provides a framework for evaluating different criteria and detailed descriptions of equations to help tool administrators apply weighted aggregation of different criteria. Includes a scale for assessing qualitative data and detailed descriptions of how to assess Embedding Reconciliation Journey Stages.



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# Overview



The land that what we have been taught is Canada, has long been called Turtle Island. The urban environments many of us live in are often detached from land connection in meaningful ways. Open public spaces in major cities and many urbanized areas across Turtle Island exist on Indigenous lands governed by inherent rights, treaties, covenants and self-government agreements. Indigenous Peoples have an ongoing presence and invaluable contribution to the evolution and reimagining of cities and placekeeping and stewardship of public spaces. While Indigenous and civic leaders and practitioners may have different worldviews, they share similar priorities and hopes for transforming public spaces to be more inclusive, vibrant, healthy and safer for all communities; and to be hubs for reciprocal land relationships, culture, healing, learning, creativity and collaboration.

**Open public spaces** are defined broadly to include parks, public squares, gardens, outdoor gathering and activation spaces, greenways, public green roofs and more. They are places where diverse social, cultural, placekeeping, land stewardship, artistic, recreational, political activities occur; and where residents and visitors can create community or a sense of collectiveness. It is clear that open public spaces should be:

- In right relationship with the land and First Peoples
- High-quality, climate and ecologically resilient
- Deeply inclusive and safe
- Responsive to the multi-faceted needs of all diverse communities.

Such public spaces are central to community life and wellbeing. Data, place-based knowledge and experiences, and community engagement play a pivotal role in the decision-making process for the development and upkeep of high-quality and resilient public spaces. By providing detailed insights, meaningful data empowers cities and communities to make informed decisions, ensuring that open public spaces serve their intended purpose effectively.

To support this endeavour, the Embedding Resilience and Reconciliation Tool has been designed to assist municipalities, placemakers, placekeepers and open space stewards in monitoring, evaluating and enhancing the impact of their open spaces on their climate resilience capacity, with a focus on both mitigation – reducing greenhouse gas emissions – and adaptation – enhancing the ability to withstand and recover from climate impacts. This tool also aims to improve community wellbeing by fostering inclusive, sustainable, resilient and safer environments that enable the collective flourishing of both communities and more-than-human worlds.

The tool invites municipalities and organizations stewarding public spaces to embark on a journey to create the conditions for learning, reflecting, engaging with community, co-creating and embedding and activating the principles and calls to action of Truth and Reconciliation and UNDRIP within open public spaces. It provides a methodology for holding themselves accountable in their collective responsibility to decolonize and right relationships with the First Peoples and the lands where the open space occurs.

A key facet of the tool is the design of aspirational questions and indicators for embedding truth, justice and reconciliation and Indigenous-inclusive approaches in the way open spaces are planned, monitored and evaluated, stewarded and governed – especially around climate and community resilience. It is strongly recommended that the administrators of the tool activate the tool in ways that prioritize and center Indigenous community engagement and guidance throughout the process, especially around the Embedding Reconciliation questionnaires and methodology. This enables Indigenous Peoples to have meaningful input with the tool usage process and learnings and ensures transparency and respect for First Peoples and Indigenous homelands that cities occur upon.

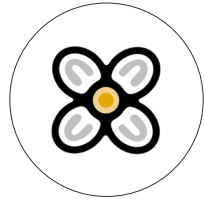
Diversity in culture, lifeways, land governance traditions and bioregional realities shape place-based land stewardship and climate and community resilience practices. The tool was designed to be inclusive, flexible, and adaptable across different settings – like open public spaces, communities, ecosystems, institutions, and cities. However, it's essential that tool administrators work closely with Indigenous and local community advisors, as well as subject experts, to adjust the questions, goals, and process to fit the unique social and environmental needs of each place. In particular,

customizing the Embedding Reconciliation questionnaires and tool process to local Indigenous contexts, and strong community engagement in the evaluation will require research and learning, and guidance and collaboration with Indigenous advisors across the evaluation journey (see the community engagement tool and other resources and protocols in the *Resources and Protocols* section in Appendix 6).



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# Purpose



TreesAI provides a series of tools to establish nature as a critical and investable part of urban infrastructure. The Embedding Resilience and Reconciliation Tool is designed to assist municipalities and placemakers, including urban planners and designers, landscape architects, Indigenous placekeepers and community leaders, and public space managers in evaluating open public spaces. The tool assesses contributions to climate resilience and community wellbeing, focusing on small to midsize municipalities and other community organizations that may lack extensive geo-spatial data but have an urgent need to enhance their open public spaces.

The tool guides open space stewards through the data preparation, collection and integration processes, offering survey questions and clear instructions on consulting the appropriate entities. The tool enables stewards to prioritize improvements to open public spaces, providing a multi-faceted, comprehensive approach to enhancing and evaluating both resilience and Truth and Reconciliation outcomes. It also supports long-term funding applications for Nature-based Solutions by supplying robust evidence of a site's impact potential.

## Objectives

**1. Assist municipalities, public space stewards, placemakers and placekeepers** in monitoring, evaluating and enhancing public spaces, focusing on climate resilience, community wellbeing,

embedding truth, justice and reconciliation and Indigenous-inclusive approaches.

**2. Outline a comprehensive strategy for monitoring, assessing and enhancing open public spaces** through a sequence of interconnected phases: preparation, data collection, data integration, data sovereignty + management, and application (see Figure 1).

**3. Provide an adaptable bank of multi-faceted survey questions** covering various criteria and thematic bundles across climate resilience, community wellbeing and embedding reconciliation that will be used in the evaluation process and can be customized to reflect specific public space, climate and community contexts.

**4. Identify and engage relevant open space users, stewards and specific experts** (including Indigenous and local knowledge holders) for data collection and learning from their diverse and situated insights.

**5. Support decision making** with detailed data and place-based knowledge that enable cities and communities to make informed and inclusive decisions, ensuring that open public spaces have improved climate resilience capacity and have the conditions for supporting multi-faceted community wellbeing and Indigenous-inclusive and reconciliation-centered approaches.

**6. Support communities and cities** in securing the funding necessary for targeted measures that can improve public spaces, such as Nature-based Solutions and Embedding Reconciliation community outcomes.

**Climate resilience** refers to the capacity of social, ecological and economic systems to anticipate, prepare for, adapt to, and recover and transform from a trend of disruption or extreme weather event, and its associated negative impacts; a system “is able to respond or reorganize in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation and learning and transformation.”<sup>1</sup> The deeper goal of climate resilience is to tackle vulnerability to climate change at its roots and support communities, natural systems and institutions as they adapt and build equitable and sustainable futures. Some well-researched and implemented interventions to build climate resilience that are both place-based and utilized globally, include<sup>2</sup>:

- Climate risk and vulnerability assessments, disclosure and monitoring
- Early warning systems and early action
- Preparedness: contingency plans/emergency response
- Climate risk governance and capacity-building
- Nature-based Solutions used to reduce risks across sectors
- Climate-proofing infrastructure and services
- Sharing of knowledge and best practices on climate risk management

In order to evaluate open public spaces in terms of resilience, this tool integrates both strategies of **climate adaptation** (adjustments to reduce vulnerability and increase adaptive capacity) and **climate mitigation** (actions to reduce greenhouse gas emissions).

The mitigation aspect is particularly relevant when evaluating open public spaces as it deals with the root of the problem, by acknowledging that these spaces can contribute significantly to reducing greenhouse gas emissions. For example, planting trees, installing green infrastructure, promoting low-carbon transportation options and implementing sustainable waste management practices (such as recycling stations or composting facilities) can enhance carbon sequestration, reduce energy use and lower waste-related emissions. Public spaces designed with mitigation in mind help communities meet their broader climate goals by contributing to long-term emissions reductions and promoting sustainable practices.

The tool takes a holistic climate resilience approach, aligning with [Canada’s 2030 Emissions Reduction Plan](#) – particularly the [Natural Climate Solutions Fund](#) and commitments to greater collaboration with Indigenous Peoples and increased investments in Nature-based Solutions. The tool evaluates the green-blue and social infrastructure capacities of open public spaces, focusing on their ability to conserve, restore and enhance natural ecosystems like trees and soil, which are critical for carbon storage, air quality improvement and reducing smog and ground-level ozone. While

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1. Annex II - Glossary - Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Intergovernmental Panel on Climate Change. [https://archive.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5AnnexII\\_FINAL.pdf](https://archive.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5AnnexII_FINAL.pdf).

2. UN Climate Change + Marrakech Partnership-Global Climate Action. Climate Action Pathway. Climate Resilience Executive Summary [https://unfccc.int/sites/default/files/resource/ExecSumm\\_Resilience\\_0.pdf](https://unfccc.int/sites/default/files/resource/ExecSumm_Resilience_0.pdf)

the national plan sets broad targets, this tool provides a practical way to bridge national climate strategies with localized, nature-based climate solutions needed in open public spaces.

**The community wellbeing** aspects of open public spaces evaluated by this tool feature the role of public spaces in promoting a cohesive, vibrant and healthy community life, underlining the importance of integrating public needs and voices in the planning and management processes to maximize their positive impact. The criteria considered for the tool refer to the public space's ability to enhance urban quality, ensure effective maintenance and regeneration, contribute to cultures of belonging and inclusiveness, and foster participatory planning and governance, thereby creating safer, accessible and inclusive environments.

Furthermore, open public spaces should be designed to support physical and mental health, facilitate active community engagement and generate economic benefits for the area. Providing opportunities and supports for community members to have a more central and active role at different stages of planning, design, programming and maintenance of open public spaces through designated **participatory planning and governance** processes is also an important community wellbeing evaluation aspect of the tool.

Most importantly, this tool is rooted in land-based, relational and **kincentric** ways of being, knowing and connecting open spaces, which recognizes the innate interconnectedness and kinning<sup>3</sup> (Kinship-in-action as verb: an intentional and active way of becoming and being kin) between community, place, land and nature, reflecting the diverse Indigenous perspectives of being in respectful, reciprocal, caring and responsible relationships with land and more-than-human worlds. Through shared philosophies of interconnectedness between all of life and that all beings, landscapes and elements of the cosmos have inherent value, agency and self-sovereignty, Indigenous cultures understand more-than-human entities and natural systems to be kin and maintain a deeply equitable and relational ethos of "all our relations".<sup>4</sup>

This includes spiritual connection to place, kinship with all living beings and landscapes, and a commitment to future generations. Indigenous stewardship protocols and practices, including climate resilience, honour the interconnected and reciprocal weave of life in the ways that people care for the ecological and spiritual health and wellbeing of the land and more-than-human communities. Open public spaces hold potential to nurture relational, spiritual and cultural bonds between people, lands and place, and can embody stewardship principles that ensure their preservation and vitality for generations to come.

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3. Concept of 'kinning' or coming into conscious, embodied relationship with more-than-human species and worlds is aligned with the writings of Robin Wall Kimmerer, Gavin Van Horn and John Hausdoerffer in the series Kinship: Belonging in a World of Relations (2021).

4. King, T. (1990). All My Relations: An Anthology of Contemporary Canadian Native Prose.

Recognizing the importance of weaving together diverse Indigenous and non-Indigenous perspectives in our understanding and practice of climate and community resilience, the tool is written using **etuaptmumk**, a Mi'kmaq concept for **two-eyed seeing**<sup>5</sup> (or multi-eyed seeing). Seeing the world from binocular lenses of Indigenous and non-Indigenous worldviews enables a holistic understanding of complex and multifaceted relationships, experiences, content and processes. The tool therefore aligns with the [\*Truth and Reconciliation Calls to Action\*](#) and the [\*United Nations Declaration on the Rights of Indigenous Peoples \(UNDRIP\)\*](#), ensuring that Indigenous perspectives, rights and knowledge systems are integral to the enhancement of open public spaces.

This tool aligns with the [\*Sustainable Development Goals \(SDGs\)\*](#) and their specific targets. By integrating these global goals, the tool ensures a comprehensive and internationally recognized framework that addresses critical aspects such as urban quality, inclusivity, health, economic benefits and environmental sustainability. This alignment not only enhances the tool's relevance and applicability but also facilitates benchmarking and progress tracking against global standards. It is important

to recognize the limitations of the SDGs, including their broad scope, potential for differing interpretations and the challenge of addressing local, cultural and place-based specificities within a global framework. Despite these limitations, the SDGs provide a valuable guiding framework for fostering sustainable urban environments.



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5. Bartlett, C., Marshall, M. and Marshall, A. (2012). Two-Eyed Seeing and other Lessons Learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing, *Journal of Environmental Studies and Sciences*, 2(4): 331-340.

# Weaving Indigenous Wisdom and Truth, Justice & Reconciliation into Our Approach



This tool and evaluation framework weave Indigenous technology, knowledge and perspectives with technical, scientific and literature-based knowledge on the climate resilience, regenerative stewardship and community well-being dimensions of public space. This tool is inspired by and honours the diverse Indigenous knowledge and wisdom traditions across Turtle Island and Abya Yala (refers to the Americas as adapted from "mature lands" in the Kuna language). It acknowledges the contributions of First Nations, Inuit and Métis Peoples in shaping our understanding of land, place and public spaces. It draws from Indigenous science and wisdom to emphasize the relationships, responsibilities and stewardship practices that guide our interactions with these spaces, fostering a deeper connection to the environment and honouring traditional knowledge systems. Indigenous ways of knowing, seeing and being enable us to understand and experience landscapes and green spaces as socio-ecological systems where people engage in holistic multilayered relationships and responsibilities to land and place.

These relationships and responsibilities include land and water stewardship and governance, placekeeping, bioregional governance, interspecies relationships, harvesting, species at risk conservation, learning and research, ceremony, health and wellbeing, artistic interactions and recreation. Another important

dimension to how we engage with landscapes and green spaces relates to re-sacralizing our relationships or bringing a sacred awareness of the life-sustaining and life-affirming quality of nature and how nature animates life within our bodies, minds and systems.

Indigenous knowledges are place-based, relational and intergenerational, emergent from the particular ecologies and spatial and trans-temporal relationships and wisdoms that people have woven over deep time. There are thousands of complex systems of knowledge, codified forms of communication and creative and innovative productions unique to particular Indigenous communities, cultural systems, homelands and global contexts and that span millennia. These knowledges are different from many recent forms such as information technology and Western science and medicine because they are based on people's land-based experiential and adaptive learning and experimentation. Indigenous knowledges are also grounded in the sacred and cultural understandings and memory that anchor teachings in particular places and time periods yet also allow for their relevance across time and space.<sup>6</sup> Indigenous science and ecological knowledge are about learning and understanding a landscape or species as a holistic entity in their wider bioregional context – and learning from that landscape or species as a teacher.

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6. Chung-Tiam-Fook, T. (2024) Guide to Championing Indigenous Employment & Leadership. Centre for Indigenous Innovation and Technology and Venture for Canada.

Indigenous knowledges are an important contribution to this tool and evaluation framework as they provide holistic, place-based and unique data and insights into changing climate and environmental conditions and their impacts on community wellbeing and health; the multiple dimensions of climate resilience; and the regeneration and stewardship of urban ecologies and green spaces. This tool draws inspiration from Indigenous approaches to land stewardship, climate resilience and community health, including **community-based monitoring**, which is a participatory methodology for integrating different types of environmental, climate and health data with local place-based stories and experiences – producing consistent, quality and ground-truthed information on climate and environmental impacts.

As part of our collective efforts in urban land regeneration, placekeeping and stewardship of public spaces (natural and built) and transformative reconciliation work in communities, it is immensely important that we honour the Indigenous lineage of cities and their vibrant contributions to flourishing, long term futures for all communities and ecologies – for today and for the next seven generations. However, ongoing colonial and assimilation policies have attempted to erase Indigenous presence and cultures and acknowledgement of adaptive, sustainable land stewardship in communities across Canada. While cities often symbolize beacons of opportunity for flourishing and prosperity, they have frequently become places and spaces of marginalization and pain for many First Nations, Métis and Inuit.

Experiences of systemic discrimination include racialized and gendered violence; and disproportionate levels of vulnerability to poverty, economic and social marginalization, climate impacts, housing and food insecurity and houselessness, incarceration and health impacts from intergenerational trauma. Even public natural and built spaces that are created as civic commons intended for all urban or neighbourhood residents to live, work, play, celebrate and participate – were often designed and planned in ways that privilege the worldviews and access of particular settler groups above those of urban Indigenous and racialized communities. In this way, civic commons or public spaces are complicit in producing and maintaining colonial structures, thus becoming naturalized settler spaces.<sup>7</sup>

This tool recognizes Indigenous inherent rights and sovereignties, including the restoration of Indigenous lands and rights for both Treaty-holders and urban Indigenous Peoples, aiming to embed and uphold the principles and calls to action of Truth and Reconciliation and UNDRIP in inclusive and meaningful ways that contribute to climate resilience and social cohesion and wellbeing in urban public spaces across geographies. Communities of now and the future need to become much more inclusive, safe and just for all people and nature, including civic infrastructure like public spaces.

It should be formally acknowledged that the First Peoples of Canada have inherent rights to live and self-determine their futures within urban lands, including practicing land stewardship and governance, placekeeping, food sovereignty and other forms of civic engagement. Municipalities and civic organizations are

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7. Chung-Tiam-Fook, T. (2021). Civic-Indigenous and Partnership Building Toolkit. Future Cities Canada and Evergreen.

uniquely positioned to embed and co-lead national transformative reconciliation processes with Indigenous Peoples, fostering stewardship, land-based learning and ceremonial activities for Indigenous community members.

In the spirit of embedding Indigenous place-based cultural, land-based, design and community-based monitoring expertise and sensibilities, as well as truth, justice and reconciliation accountabilities in the tool, **Embedding Reconciliation Questions and Indicators** are integrated in each area of evaluation criteria across the climate resilience and community wellbeing questionnaires. They signal aspirational goals for integrating Indigenous-inclusive design, planning, stewardship and community-based monitoring perspectives and actioning Truth and Reconciliation principles and commitments. Each Embedding Reconciliation question is a call to action, inviting open space stewards into righting relationships with the Earth and First Peoples. The questions are grounded in holistic, multifaceted understandings of relationships to public spaces and urban ecologies and community health and wellbeing (e.g. cultural, spiritual, ecological, stewardship, physical, recreational and economic). They also include considerations of more-than-human relations and future generations.

Embedding Reconciliation Questions and Indicators call on stewards and designers of open public spaces to be intentional in acknowledging Indigenous sovereignty and Indigenous homelands in cities and urbanized areas across Canada and in creating spaces that are inclusive of Indigenous cultures and shared futures. In this way, they add a vital, qualitative and transformational dimension to the surveys that makes visible Indigenous Peoples' presence, rightsholding, knowledges and aspirations within climate resilient design, planning and governance of these spaces.

## Indigenous Land and Climate Stewardship Principles

Indigenous cultures across Turtle Island continue to enact ancient, long-held practices of organizing and providing for themselves to sustain and regenerate life for communities and more-than-human worlds through multi-faceted relationships with the land (spiritual, cultural, ecological and material), and governance structures that are integrated with the Earth. Contemporary practices and protocols of Indigenous land and place stewardship embrace a holistic approach to the environment, grounded in the sovereignty of Indigenous Nations and Communities to care for their lands and resources for both current and future generations, and weave in both place-based wisdoms and planetary ethics (see Resources for a breakdown of the Indigenous land and environmental stewardship rights woven through this section).

Although connection to land and place is central to diverse Indigenous identities and systems, for many urban Indigenous Peoples these relationships can be complex and painful due to histories of forced removal, dislocation, and cultural loss caused by state-led genocide and assimilation. Having to take root and adapt to cities and diverse cultures where Indigenous histories and presence have been structurally marginalized and even erased, makes connection to place more complex and necessitates an anchoring in identity, community and land within urban hubs. Despite the often disjointed and traumatic paths that bring Indigenous Peoples to cities, land and more-than-human relations continue to be home, as beautifully captured by the Anishinaabe oral teaching that the land and animals are the first family of humans.

Through shared philosophies of interconnectedness between all of life and that all beings, landscapes and elements of the cosmos are believed to have inherent value, agency and self-sovereignty – Indigenous cultures similarly understand more-than-human

entities to be kin and maintain an inclusive, relational ethos of “all our relations”.<sup>8</sup> When lands and natural beings are family, and their health and wellbeing deeply interconnected with healthy human lives and lifeways – they are less likely to be disregarded or perceived as commodified resources to be owned, extracted, overharvested or reengineered. Restoring connections and access to the land is a critical dimension of Indigenous truth, justice and reconciliation and in more recent years, Indigenous stewardship initiatives of municipally managed lands have been better recognized and supported.<sup>9</sup> Moreover, these Indigenous-led initiatives provide opportunity and access to land for urban Indigenous communities, as part of a deeper process of righting relationships that also recognizes urban Indigenous land sovereignty.

Indigenous land stewardship and regeneration practices in urban settings solidify the principles of interconnectedness and kincentric ecology<sup>10</sup> and activate people’s spiritual and cultural obligations and intergenerational responsibilities to care for urban lands and Creator’s gifts. Indigenous self-determination and leadership in land stewardship, including climate and ecological resilience, (blue) green infrastructure and regenerative sustainability and urban agriculture, are seen in many exciting initiatives across Canada and have much to teach public open space stewards and municipalities. Moreover, it is important for open space stewards to understand and approach open spaces and climate and community resilience as a set of entangled relationships, values and responsibilities embedded in Indigenous homelands and inherent rights and sovereignties; and accountabilities to natural worlds, inclusive community building and future generation, that resonate with Indigenous lifeways.

## Community-Based Environmental and Climate Monitoring

Indigenous culturally embedded and land-based perspectives of climate and environmental change and community-based monitoring tools can enable strong foundations for climate resilience, community wellbeing and centering Indigenous-inclusive approaches and Truth and Reconciliation actions in the planning, monitoring, evaluation and stewardship of open spaces.

Community-based monitoring is a land-based practice with deep roots in many Indigenous cultures, and the ability to link changing climate and environmental patterns with assessing the capacity of public open spaces and open space stewards to anticipate, prepare for, adapt to, and recover and transform from climate and extreme weather events, and their ecological, social and infrastructural impacts.

Largely driven by and for First Nations, Inuit and Métis communities, community-based monitoring (CBM) represents an important methodological tool for integrating environmental, climate, cultural and social data, and Indigenous and other scientific expertise. This methodology is evidence-based and produces consistent, quality and place-based information on climate change and ecological impacts that can be tracked over time and used to forecast or anticipate future climate impacts and their intersection with both land and community wellbeing and health indicators based on monitored trends and conditions. Grounded in Etuaptmumk or Two-eyed Seeing, CBM is a Multiple

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8. King, T. (1990). *All My Relations: An Anthology of Contemporary Canadian Native Prose*.

9. First Nation-Municipal Community Economic Development Initiative (CEDI). <https://www.cedipartnerships.ca/>

10. Salmon, E. (2000). Kincentric Ecology: Indigenous Perceptions of the HumanNature Relationships, *Ecological Applications*. 10(5).

Evidence-Based Approach<sup>11</sup>, as it braids together Indigenous, local, and western scientific knowledges to produce an evidence base that can enhance resilience and regenerative sustainability, while respecting the integrity and context of each knowledge system (Raygorodetsky & Chetkiewicz, 2017).

CBM approaches reflect each community's unique capacities, tools, approaches and challenges for how they monitor and assess experiences of climate and environmental vulnerability and impact, and plan for adaptation and mitigation. In this way, it is driven by the agenda, priorities, skills and place-based experiences of each community (and facilitating organization). The tool provides a long-term baseline of observable and culturally-relevant data on land and water systems and wildlife behaviour that can be useful for land and resource use planning and decision-making. Elders and other land stewards and defenders contribute to the identification of indicators and basing them on local knowledge and experiences of change, as well as cultural and spiritual dimensions of change. Common underlying values that have been recognized by the Community-based Monitoring Program in Northern Ontario (Raygorodetsky & Chetkiewicz, 2017) are access to and use of ancestral territories, status of subsistence species, issues related to social and economic rights, and participation in environmental decision-making.

CBM is valuable in thinking about and documenting innate complexity in open spaces, including monitoring and adapting open spaces to environmental patterns and changes related to land relationships, weather, biodiversity, wildlife behaviour, water

quality and institutional and municipal shifts. When designed and implemented under the guidance of Indigenous stewards and Knowledge Keepers, CBM methods and criteria are integral to the lifeways of Indigenous Peoples across Turtle Island and beyond, and weave well within traditional teachings and community land stewardship and landscape planning. There is also opportunity for restoring or strengthening local decision-making and governance capacities based on the availability of nuanced and culturally-relevant datasets on climatic, ecological and community wellbeing indicators. The reminder to “watch, listen and learn to understand change” reverberates through Elder teachings and is the slogan for community-based monitoring initiatives in Northern Ontario First Nations (Morgan-Siegers, 2018; Raygorodetsky and Chetkiewicz, 2017).

Civic and municipal open space stewards interested in working with Indigenous land stewards and Knowledge Keepers to utilize this monitoring method should research CBM frameworks and how they align with the Embedding Resilience and Reconciliation Tool, and the organization's goals for both collecting data and centering Indigenous community and Indigenous approaches in monitoring and evaluation of the open space. Open space stewards should engage with relevant community advisors at the beginning of the CBM process design, deferring to the expertise, priorities and leadership of Indigenous advisors and land-based experts. There are a number of relevant and distinctly Indigenous-led frameworks for climate change and Indigenous rights, environmental monitoring and environmental health monitoring that are included in the Resources.<sup>12 13</sup>

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11. As described by the United Nation's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services in Hernandez, A. (2022). Webinar: Indigenous and local knowledge in biodiversity assessments - from local to global <https://www.ipbes.net/ilk-unpfii-webinar-2022>

12. Indigenous Climate monitoring Toolkit, <https://indigenousclimatemonitoring.ca/about-us/indigenous-led-climate-monitoring/>

13. Indigenous Climate Action Toolkit and other resources, <https://www.indigenousclimateaction.com/publications>

## GUIDING PILLARS FOR EMBEDDING RESILIENCE AND RECONCILIATION\*

This tool is grounded in diverse Indigenous laws and protocols that guide respectful engagement and stewardship with land and place. Collectively, these laws and principles are woven intentionally, holistically and respectfully throughout the tool to support climate resilience, community wellbeing, and the embedding of Truth and Reconciliation in meaningful and relational ways. Along with Elder engagement protocols and Indigenous environmental stewardship rights, Indigenous laws and principles are vital to embedding truth, justice and reconciliation and climate and ecological resilience outcomes in public space planning and stewardship.

The following Four Pillars are from a wider Nêhiyaw lineage on Turtle Island – Wahkôtowin (Kinship), Pimâtisiwin (Sacredness of Life), Miyo-wîcihtowin (Kindness & Respect), and Sihtoskâtowin (Helping One Another) – reflect foundational Nêhiyaw laws<sup>14</sup> that guide the stewardship of lands, including open public spaces and offer an Indigenous-inclusive framework for understanding our responsibilities to land, spirit, community, and future generations:

### **Kinship & Interconnectedness (Wahkôtowin)**

All beings—people, animals, plants, waters, and lands—are interconnected through relationships of reciprocity and care. This tool recognizes that public spaces are not isolated entities but part of a living network. Stewardship practices must honour these relationships by reducing harm, creating connection, and respecting the natural world.

### **The Sacredness of Life (Pimâtisiwin)**

Life is sacred and must be protected. Stewardship of public spaces is a responsibility to sustain life by conserving ecosystems, supporting biodiversity, and ensuring a healthy future for all living beings. This tool encourages actions that uphold the vitality of both human and more-than-human communities.

### **Kindness & Respect in Action (Miyo-wîcihtowin)**

Respect and kindness are the foundation of good relationships. Embedding reconciliation and resilience requires care — for the Earth, for future generations, and for one another. This tool supports inclusive, culturally safe, and participatory approaches that reflect these values in design, planning, and governance.

### **Helping One Another (Sihtoskâtowin)**

Stewardship is a shared responsibility. No one can do this work alone. This tool emphasizes collaboration across communities, municipalities, and Indigenous rightsholders to co-create public spaces that are resilient, inclusive, and rooted in mutual support.

These Nêhiyaw Four Pillars are aligned in spirit, purpose and embedded relationships and responsibilities with a diversity of other First Nations, Métis and Inuit natural laws and cultural principles, including the seven sacred teachings<sup>15</sup> of the Anishinaabek Nation (and widely held across different First Nations, Métis Nations, and Inuit), the seven fundamental laws<sup>16</sup> of the Coastal First Nations in what is known as British Columbia, and Inuit Qaujimagatuqangit (IQ) or Inuit ways of knowing<sup>17</sup> from across the Nunangat (see the Resources section in Appendix 6).

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14. Shared by Nêhiyaw Knowledge Keeper, Delanie Passer (2025). Wapi Kihew Attention to Creative Solutions, Inc.

15. Bouchard, D. & Dr. Joseph Martin. *The Seven Sacred Teachings of White Buffalo Calf Woman/ Niizhwaaswi Aanike'iniwendiwîn Waabishiki mashkode bizhikiins ikwe.* (2009). North Vancouver: More Than Words Publishers.

16. Brown, F. and Y.K. Brown (compilers). 2009. "Staying the Course, Staying Alive –Coastal First Nations Fundamental Truths: Biodiversity, Stewardship and Sustainability." Biodiversity BC.

17. Education Framework: Inuit Qaujimagatuqangit For Nunavut Curriculum. (2007). Nunavut Department of Education, Curriculum and School Services Division.

# Indigenous Community Reflections & Future Iterations of the Tool



The Embedding Reconciliation dimension of the tool presents a new framework – informed by collective wisdom and expertise – for monitoring and evaluating climate resilience, community wellbeing and Indigenous-inclusive approaches, and actioning Truth and Reconciliation in public spaces. It is therefore important that we pilot this holistic framework with Indigenous leaders and practitioners from across the country, who bring both place-based and diverse Indigenous insights and sensibilities, as well as they embody the multiple lenses woven throughout the tool. Among them, these insights and expertise include: Truth and Reconciliation leadership, Place Keeping, Indigenous-inclusive design and strategic planning, land stewardship and governance, climate resilience, and community engagement through their work and leadership in community, civic, academic and governance contexts.

Their wise and generous feedback on the tool is foundational for it to become a valuable deep learning and improvement process for organizations and municipalities in their journey of (un)learning, reflection, community engagement, co-creation and co-leadership in Indigenous-informed and Reconciliation-centered public space design, planning and stewardship. Feedback from these Indigenous advisors and collaborators, and ongoing feedback from Indigenous community who administer the tool themselves, or

advise allied stewards on using the tool, also provides insight into the tool's cultural and strategic relevance and application within Indigenous community and land co-stewardship or co-governance contexts – and its wider value to Truth, Justice and Reconciliation and urban Indigenous land sovereignty and LandBack initiatives.

There is enthusiastic feedback across reviewers about the tool's rootedness in Indigenous perspectives and Indigenous-inclusive content and frameworks, and the overall value, intention, scope, process-based design and application, and set of possibilities that the tool offers to public open space stewards and community land and place stewards. There is also collective appreciation for the decolonial and reconciliation-centered framing, methodology and questions in the tool, and the invitation for open space stewards and organizations to embark on a journey of decolonization and structural transformation in action. Recognition of the offerings and features of the tool can be bundled into the following areas:

- The tool offers a braiding of multiple methodological approaches and protocols, including survey-style and quantitative evaluation methods; and qualitative, journey-style methods based on Indigenous knowledges, Truth and Reconciliation, 7 Generations teachings, Indigenous self-determination and sovereignties.

- The tool is grounded in Etuaptmumk or Two-Eyed Seeing as a guiding principle for weaving Indigenous and other knowledge systems and worldviews.
- The tool is grounded in relationship and responsibility and presents practical pathways for transformative change.
- The tool centers Indigenous sovereignties, including land and data sovereignties, as well as Indigenous community and wellbeing.
- The tool offers an inclusive and holistic process and uses inclusive, respectful and nuanced language.

Important areas of recommendation that reviewers proposed for strengthening the tool from an Indigenous open space steward and tool administrator's perspective include:

- A central concern is that the tool is not completely framed around Indigenous perspectives and applications of land sovereignty and land stewardship, and co-governance with civic and municipal stewards in open spaces. It was recommended that the tool be framed as Embedding Resilience through Reconciliation and showcase the Embedding Reconciliation journey methodology and questionnaires as the most innovative contribution with the tool.
- While the questionnaires and journey framework have been written in a way that is inclusive of and transferable to any open space setting, and the language can be easily customized, the tool scope focuses exclusively on urban public open space context and is not specifically inclusive of non-urban Nations and Communities on treaty and rural lands.

- Linking tool outcomes to concrete, innovative funding mechanisms and long-term municipal commitments e.g. impact bonds, conservation finance could provide Indigenous-inclusive practices recommended by the tool with required sustainable funding to move from evaluation into action.
- While the Reconciliation Journey Scale is a powerful framework, more explicit guidance is needed on pathways to Indigenous co-governance and shared authority over public spaces. True Reconciliation means Indigenous Peoples leading and co-leading in stewardship and decision-making.
- Recommendation for the more encompassing term of 'environmental or ecological resilience' to describe the tool, rather than 'climate resilience' as it better reflects the multifaceted and integrative thinking and approach. Many Indigenous cultures understand climate resilience to be part of a broader understanding of the capacity of a social-ecological system (whether a public open space or ecosystem or bioregion) to withstand climate and other environmental disturbances and to adapt, reorganize, and recover and potentially transform to maintain the long-term health and stability of the natural system, and the communities that it sustains. Many non-Indigenous researchers and practitioners also share this wider understanding of ecological resilience incorporating climate challenges among many others, especially those in regenerative fields such as bioregioning.

While we completely agree with this recommendation in how we have conceptualized and designed every facet of the tool, and we interpret resilience in this encompassing and transformative social-ecological systems approach<sup>18</sup>, the term 'climate resilience'

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18. Chung-Tiam-Fook, T. (2017). Transformational processes for community-focused adaptation and social change: a synthesis, *Climate and Development*. 9(1): 5-21.

focuses the tool on an array of climate-related challenges to open spaces and links with Evergreen's leadership in designing Climate Ready Schools.<sup>19</sup>

These concerns and recommendations carry so much gravity in terms of what would provide a more complete picture in terms of Indigenous stewardship and shared governance of lands and open spaces (urban, treaty and rural homelands) and coming into right relationship in a more fulsome way. This project was originally commissioned to be a place-based climate resilience evaluation tool with a wide audience of open space stewards and tool administrators, and we therefore had to balance and weave the diverse objectives, frameworks, knowledge systems and perspectives included in the tool. We have sought to ground and frame the work within the shared love, respect, understandings, responsibilities, and deep care for land and Creator's gifts among the diverse Indigenous contributors and prospective collaborators.

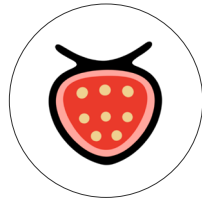
While some of the recommendations are beyond the scope of this particular project, they truly inspire a potential 2.0 version of the tool, which would be fully centered on Indigenous-led and co-led open spaces and land governance approaches, and culturally embedded, land-based and decolonized frameworks. This second version would be designed specifically for Indigenous open space and land stewards, land defenders, water protectors, placekeepers, planners, (blue)green and social infrastructure practitioners, and architects and designers.

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19. Evergreen. Canada's First Climate Ready School, <https://www.evergreen.ca/projects/canadas-first-climate-ready-school/>



# Tool Process



The Embedding Resilience and Reconciliation Tool outlines a comprehensive strategy for assessing and enhancing open public spaces through a sequence of interconnected phases: preparation, data collection, data integration, data and application (see Figure 1).

1. In the initial preparation phase, the groundwork is laid by mapping open public spaces, defining evaluation criteria from a checklist and gathering any existing data. This sets the stage for the data collection phase, where surveys are conducted with community users, stewards and specific experts to gather nuanced insights.
2. We cannot overemphasize the importance of capturing lived experiences on the ground, as these provide invaluable insights into how open public spaces are utilized, perceived and valued over time. Surveys should be inclusive of diverse community members, including Elders, youth, Indigenous Peoples and other racialized communities, newcomers, 2SLGBTQ+, socioeconomically marginalized, and differently abled individuals. Attention must be given to inclusiveness and equity and ensuring that the voices of sovereignty-deserving communities are heard, respected and included. Devoting time to researching and learning about the different demographic, cultural and accessibility contexts of community users is highly

recommended, and soliciting guidance from advisors is often a wise practice. By gathering perspectives from a wide range of open public space users, we can better understand the unique needs and aspirations of different groups, ensuring that the design and stewardship of open public spaces are truly reflective of, and responsive to, the entire community. Depending on the questions and particular communities or social groups being engaged, questionnaires can be customized to be relevant to the interests and contexts of those community users.

3. For the Embedding Reconciliation sections of the tool, Indigenous staff and/or community advisors must be engaged very early in the process to advise and collaborate in building this facet of the questionnaire deck, as well as a community engagement process to identify the community subject experts and community members who should be engaged in the data collection phase. Indigenous advisors can also guide evaluators in relevant supplemental materials, and observing cultural, research ethics and community-based monitoring protocols. For more introductory guidance to ground, learn and resource Indigenous-inclusive approaches, decolonizing and reconciliation-centered processes, and community engagement, please see the [\*Civic-Indigenous Toolkit on Placekeeping\*](#)

[and Partnership Building](#)<sup>20</sup> (produced with Evergreen) and [Championing Indigenous Inclusion and Leadership Guide](#)<sup>21</sup>.

It is also important to collect specific data on public space stewardship and governance, distribute surveys to actors who lead and maintain the open public space, curating only the questions directed to stewards and staff indicated in the table of questions. Indigenous people are rightsholders of public spaces as they occur on Indigenous homelands and green community collaboratives and groups that often partner with Indigenous organizations and leaders in Canada. This approach ensures that diverse perspectives and Indigenous knowledges and approaches are integrated into the design, stewardship and maintenance of public spaces, enhancing their inclusiveness, sustainability, cultural relevance and safety.

An integral aspect of cultural safety and Indigenous data sovereignty (discussed in Step 11) is that the collection of Indigenous knowledges and cultural expressions data is accompanied by a data sharing agreement co-developed with relevant Indigenous advisors and Knowledge Keepers. This data sharing agreement would commit the tool administrator and/or data collection team to data confidentiality and appropriate data sovereignty protocols. Protocols for compensating Elders and Knowledge Keepers should also be followed (See Resources section in Appendix 6 for guiding data sharing and data sovereignty protocols that can be adapted to your context with relevant Indigenous advisors).

Furthermore, to collect data on specific knowledge areas and open space user experiences necessary for assessing an open public space, conduct site surveys with subject and local experts on various topics. Engage local environmental or watershed organizations and scientists, garden specialists or botanists and urban foresters, geologists, place-based and cultural programming specialists, health and occupational therapists, participatory engagement specialists, and other relevant professionals. These experts will provide specialized knowledge on issues such as flood resilience, soil health, plant biodiversity, geological features, urban forests and wildfires, participatory governance and public health. By collaborating with these experts, we can assess the current conditions and identify opportunities for improvement. This multidisciplinary approach ensures that the evaluation is informed by scientific, technical and Indigenous and place-based knowledges, enhancing the spaces' resilience, sustainability and overall wellbeing for the community.

Following data collection, the integration phase involves analyzing and combining all data into a single scorecard or Embedding Reconciliation Journey Scale to calculate climate resilience and community wellbeing scores, and gauge journeys of learning, integration and actioning Indigenous-inclusive approaches and reconciliation actions across different criteria. Analyzing qualitative data generated by the Embedding Reconciliation questions and detailed notation from other questionnaires enables evaluators to look closely at nuances and patterns

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20. Chung-Tiam-Fook, T. (2021). Civic-Indigenous Toolkit on Placekeeping and Partnership Building, Evergreen. <https://evergreen.ca/resource-hub/resources/civic-indigenous-placekeeping-and-partnership-building-toolkit/>

21. Chung-Tiam-Fook, T. (2024). Championing Indigenous Inclusion and Leadership Guide for Tech and Innovation (transferable across sectors and fields of practice). <https://synonymous-poinsettia-e1a.notion.site/Championing-Indigenous-Employment-Leadership-A-Guide-for-Tech-Innovation-Media-Kit-10a826bf5fac809eaaf6c4c7d17baaac>

or themes emerging from the data, and to deduce insights. Grounded analysis and sensemaking from the data can be more inductive and enable collaborative meaning and knowledge making with relevant participant groups, especially Indigenous participants, transforming data into actionable learning, reconciliation-based journey progression, and targeted measures aligned with restorative values, Nature-based Solutions, and Indigenous community outcomes.

Data and sensemaking findings can be visualized through maps, graphs and diagrams to illustrate overall scores and journeys (current and aspired) of the open spaces and work to embed Indigenous-inclusive elements and reconciliation, facilitating easy comparison between sites and the themes. Maps can be specifically used to highlight spatial points of strength, opportunity, constraint, community benefit, and risk. Based on evaluation results, the integration phase also includes developing tailored management plans for improving public spaces and community relationships.

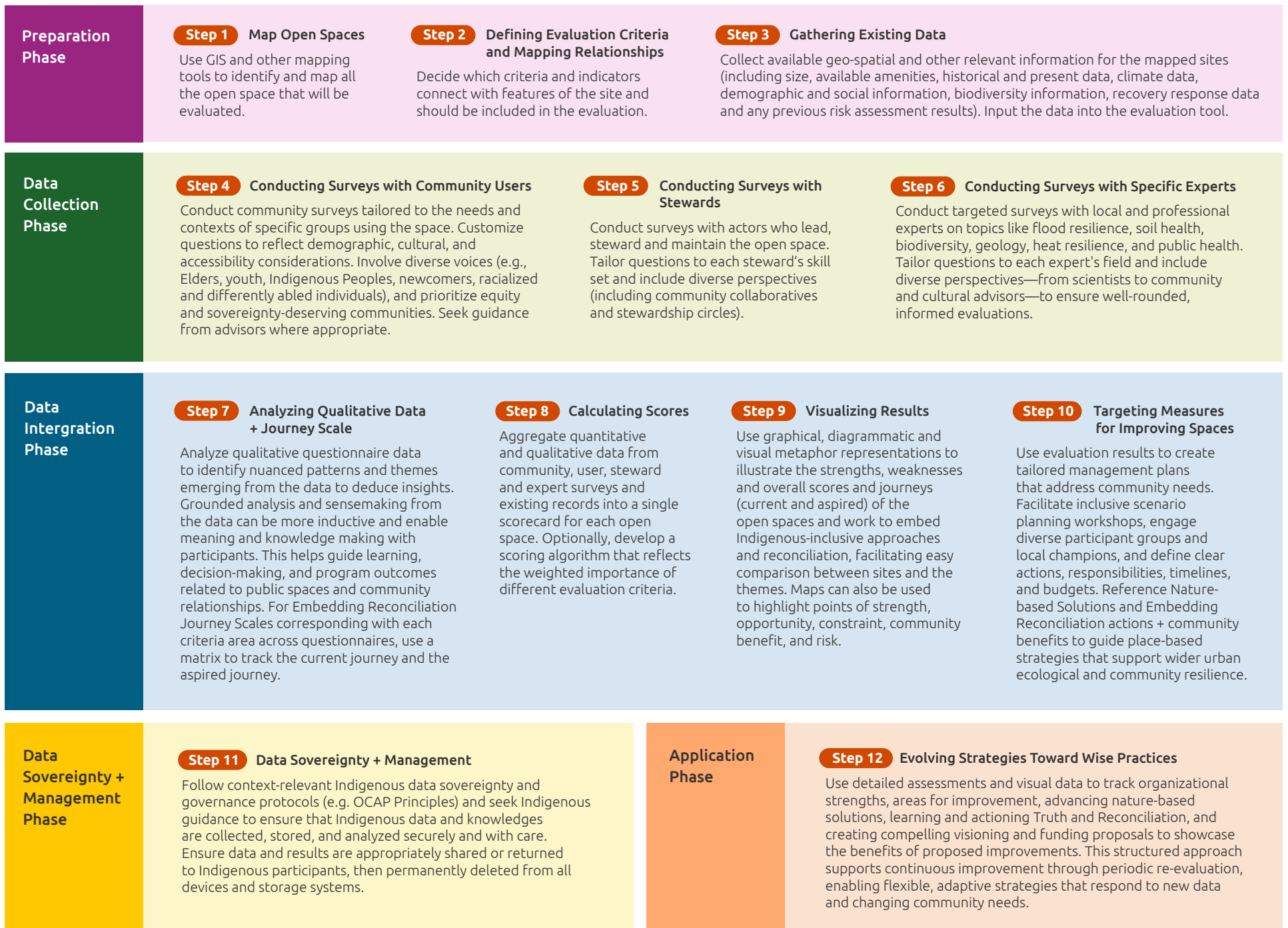
Eclipsing the data collection and integration phases, the data management and data sovereignty phase raises important considerations that must be understood and undertaken, especially about the data sovereignty of Indigenous Peoples. Overall, tool administrators should be aware that protecting and ensuring data privacy and confidentiality is vitally important for any research and evaluation exercise where participants are involved and appropriate measures should be taken to protect the identities of participants who do not wish to be identified in any qualitative data collection and detailed assessments or findings. With respect to Indigenous community engagement and the integration of potentially sensitive cultural data and knowledge, a particular level of awareness and care must be

used with protecting the data privacy and data sovereignty rights and interests of Indigenous participants in the open public space assessment process.

In the final phase, the diverse and rich insights captured through the evaluation process can be applied to build and enhance internal learning and capacity in climate resilience, community wellbeing and embedding Truth and Reconciliation learning and action; tailor and enhance public space design, planning and management plans; and ensure that the strategies informed by this process are wise, actionable and supported for effective implementation. Tracking organizational strengths, areas for improvement, advancing nature-based solutions, learning and actioning Truth and Reconciliation, and creating compelling action plans and funding proposals that showcase the multiple benefits of proposed improvements – is an effective way to improve and develop wise practices. This structured and locally grounded approach underscores the tool's capacity to be periodically re-evaluated, allowing for the iterative, dynamic adjustment of strategies in response to new data and evolving community needs.



**Figure 1: Process for Open Public Space Evaluation Tool**



# Embedding Resilience and Reconciliation Tool

Collecting data and processing information on local factors enables us to build the foundational work to assess open public spaces with a focus on ecosystem services that make the most sense in the context. We do this through a Resilience-Based Vulnerability Assessment, which analyzes how changing climate conditions interact with pre-existing social, economic and political factors to impact communities, ecosystems, and infrastructures in a local context; and identifies ways for those systems to build internal resilience, adapt and mitigate impacts.

This tool has been developed as a continuation of [TreesAI's Location-based Scoring](#), a tool originally designed to assess climate risks spatially and support the design and prioritization of various urban Nature-based Solutions. The Location-Based Scoring (LBS) framework enables the comparison of areas based on a defined set of parameters. This involves a structured process of identifying indicators, assessing their suitability, gathering the necessary data and reformulating indicators if sufficient data cannot be found. Initially, LBS was built to utilize extensive institutional databases; however, we have adapted the methodology for smaller municipalities and communities that may not have large GIS databases at their disposal. This new version of the tool incorporates more place-based data collected through local surveys, ensuring that the analysis reflects on-the-ground realities and specific local conditions that measure resilience.

This survey-based tool is structured around two principal themes: climate resilience and community wellbeing. Each theme is further divided into several subtopics, assessed through carefully selected indicators designed to evaluate the multifaceted aspects of public spaces comprehensively. Indicators are first sorted to identify climate risk hazards, exposures and vulnerabilities. These indicators are based on a community's strategic risks, literature, local Indigenous knowledge and available data.

To collect this data, the respondents navigate a series of multiple-choice questions tailored to these subtopics, providing insights into the current state and performance of the public space being assessed. Responses to these questions are quantitatively scored, allowing for an aggregated score to be calculated for each category. This scoring system highlights areas of strength and identifies opportunities for improvement, enabling targeted interventions to enhance both the ecological resilience and social value of public spaces.

A point to emphasize is that while the scoring system is designed to facilitate the comparison of different areas based on a consistent set of resilience parameters, there is also flexibility built into the tool. Open space stewards are empowered to customize surveys to fit their data collection capabilities, ensuring that the evaluation process is adaptable to various contexts and resources. The tool administrator is also encouraged to customize the tone and wording of the questions as needed to best match the community's characteristics and the specific objectives of your analysis.

# Mapping the Open Public Spaces for Evaluation

## Step 1

The first step in the evaluation process is to map the open public spaces that will be assessed. Given the tool's land-based scoring approach to measuring public spaces, tool administrators should provide a rationale for the selection of spaces they are evaluating, especially if not all spaces are being assessed. Examples of this could be to only include green public spaces or spaces that meet a certain criteria/threshold for planning or development purposes.

Utilize Geographic Information Systems (GIS) (if available) and other mapping tools to identify and map all open public spaces within the area of interest that will be subject to evaluation. This includes parks, gardens, gathering and activation spaces, greenways, natural reserves, parkettes, public green roofs, arboretums, botanical gardens and community gardens. Accurate mapping is crucial to ensure that the evaluation is thorough and that all relevant areas are included.

By mapping the open public space, stewards can create a visual representation that helps understand the spatial distribution and connectivity of these areas. This process also aids in identifying potential gaps and opportunities for enhancing open space accessibility and resilience. Engaging experts in this step, such as geographers and urban planners, ensures that the mapping is precise and represented appropriately.

# Defining Evaluation Criteria and Mapping

## Step 2

Defining evaluation criteria can always be a momentous task when you are unsure of where to start. If you are looking for additional resources as a point of introduction, please see Evergreen's [Progressing to Resilience Toolkit](#) for potential evaluation criteria at the community level; and the Embedding Reconciliation Companion document for a closer look at embedding Indigenous inclusive design and Truth and Reconciliation concepts and criteria. These resources may provide a better understanding of the initial steps.

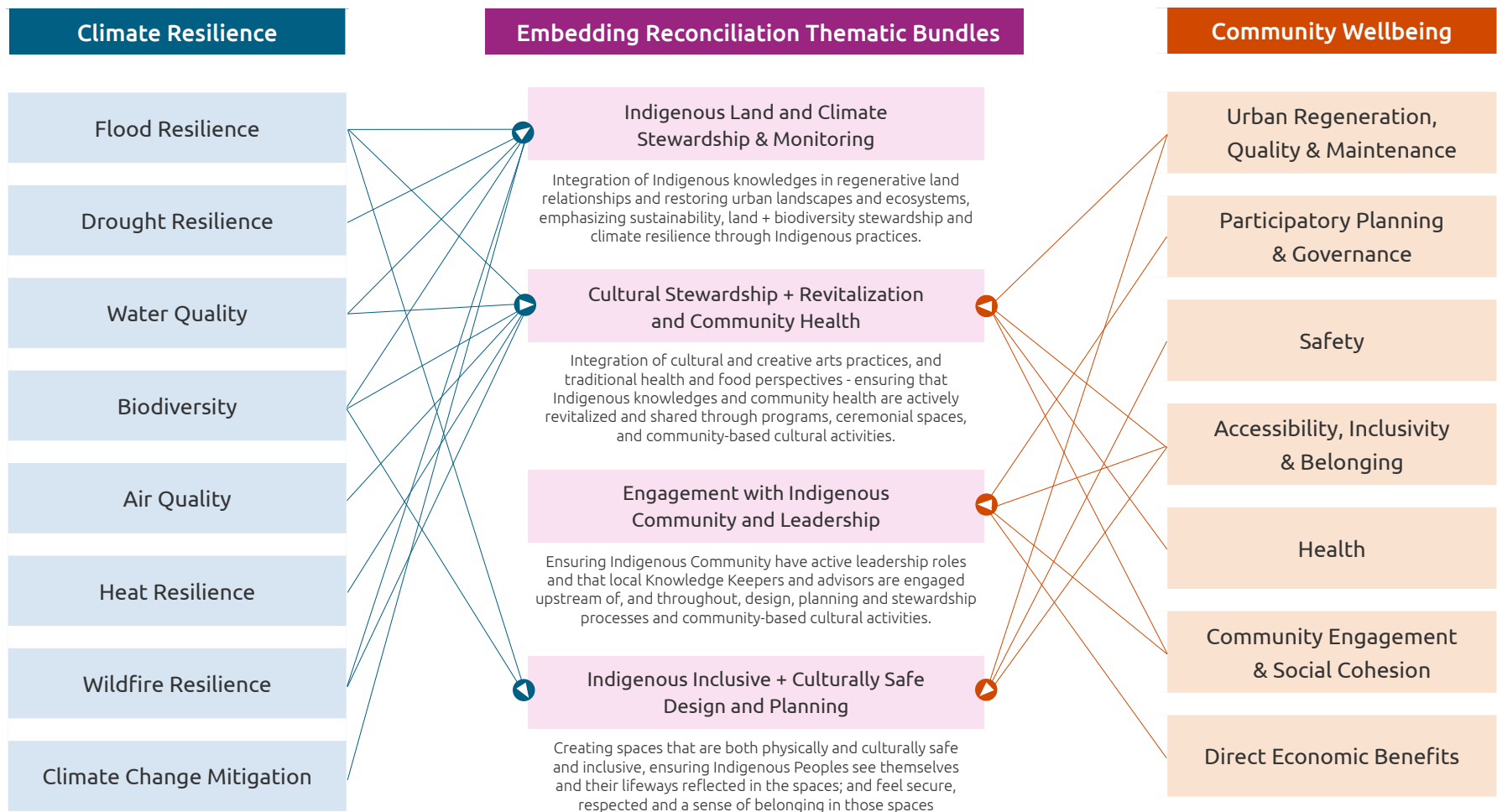
Please utilize the checklists below to select the most relevant scoring criteria that align closely with your local community's needs. For instance, biodiversity loss may not be a concern in your community but the community is prone to flooding and there are increasing risks of extreme heat. For community wellbeing, it is highly recommended that all of the criteria be considered for the evaluation process – even as aspirational aspects to develop or enhance for design, planning and governance of the open public space. This checklist ensures your evaluation comprehensively addresses the unique attributes and requirements of your community's open spaces.

*Table 1: Define Evaluation Criteria*

Climate Resilience	Community Wellbeing
<ul style="list-style-type: none"><li>• Flood Resilience</li><li>• Drought Resilience</li><li>• Water Quality</li><li>• Biodiversity</li><li>• Air Quality</li><li>• Heat Resilience</li><li>• Wildfire Resilience</li><li>• Climate Change Mitigation</li></ul>	<ul style="list-style-type: none"><li>• Urban Quality &amp; Maintenance</li><li>• Participatory Planning &amp; Governance</li><li>• Safety</li><li>• Accessibility, Inclusivity &amp; Belonging</li><li>• Health</li><li>• Community Engagement &amp; Social Cohesion</li><li>• Direct Economic Benefits</li></ul>

The following diagram provides a visual mapping of the multi-faceted relationships between the Embedding Reconciliation indicators and the Climate Resilience and Community Wellbeing criteria that organize the questionnaires. The Embedding Reconciliation indicators have been clustered into four thematic bundles, each with some detail about specific indicator topics for learning and action, and evaluation. It is important to understand that the Embedding Reconciliation sections are woven across the different questionnaires and have overlapping and mutually reinforcing relationships with both climate resilience and community wellbeing.

Figure 2: Mapping Relationships Between Embedding Reconciliation Indicators + Climate Resilience and Community Wellbeing Criteria



By including Embedding Reconciliation indicators alongside climate resilience and community wellbeing criteria, we ensure that the evaluation process and future design and planning elements reflect Indigenous knowledges, approaches and aspirations, contributing to the creation of open public spaces that are not only resilient and sustainable but also culturally meaningful, restorative, and supportive of community wellbeing for Indigenous Peoples and a diversity of communities.

Understanding these intersecting relationships can help you navigate the Embedding Reconciliation aspirational questions and your organization's wider journey to learn and engage with Indigenous communities and activate Truth and Reconciliation commitments and Indigenous-inclusive public space stewardship. Working through your Embedding Reconciliation journey while you assess the quality of the site's climate resilience and community wellbeing can improve open public spaces in ways that reinforce social, ecological and place-based resilience and value for Indigenous and non-Indigenous communities. In this way, Embedding Reconciliation questions are integral to the integrity and effectiveness of the tool.

# Gathering Existing Data

## Step 3

In this step, gather any existing quantitative and qualitative data that is relevant to the evaluation of the spaces. This data may include pre-existing information such as area measurements, available amenities, historical usage data, climate risk maps (e.g., flood, pollution, or heat risk), biodiversity reports and any prior site surveys. In many cases, these data sources may already provide answers to certain survey questions, reducing the need for new data collection. Qualitative data is equally important, particularly for the surveys on Community Wellbeing and Embedding Reconciliation, where descriptive, relational, culturally sensitive, interpretive and anecdotal information can be critical.

It is recommended to use local and subject experts and sources for both quantitative and qualitative data for each survey and Question/Indicator. Organize the gathered data to directly inform and answer survey questions wherever applicable. This step ensures that the evaluation is based on a foundation of diverse and ground truthed data, minimizing the need for duplicative efforts and streamlining the survey process.

Appointing a lead facilitator from the organization conducting the evaluation may be worthwhile to not only coordinate the survey process and ensure relevant data is collected from all rightsholders/stakeholders, but they can also identify and integrate any pre-existing data related to the site. The partner facilitator will serve as the communication and information nexus, bridging gaps and clarifying queries throughout the evaluation process.

**TIP: It is important to keep current and historical records of climate-related events (such as floods or heat waves), to maintain a continuous institutional memory of these occurrences. This archive will support future planning, adaptation, and resilience efforts for public spaces, enabling communities to learn from past experiences and better prepare for future challenges.**

# Conducting Surveys

**Step 4**

**Step 5**

**Step 6**

For each subtopic within the themes of Climate Resilience and Community Wellbeing a tailored set of multiple-choice questions has been compiled in survey tables (see Appendix 1 for the survey tables). Some of the survey questions are designed to capture quantitative data that can be derived from the existing data collected in Step 3, whereas other survey questions aim to understand how respondents perceive the space, capturing qualitative insights and lived experiences.

By distinguishing between these steps, tool administrators can clearly understand what type of information is being gathered at each stage and how it contributes to the overall evaluation of the open public spaces. Additionally, Steps 3 and 4 can be conducted simultaneously, allowing for efficient data collection and survey responses that inform and complement each other.

As you embark on the survey, ensure that all relevant questions corresponding to your selected criteria are answered by the appropriate partners, ranging from communities, stewards and maintenance staff and specific experts. Each question offers five choices that represent a gradient from low to high scores. High scores signify robust qualities of the public space, suggesting lower risk and greater resilience, whereas lower scores may indicate areas that are lacking, thereby signaling a higher risk and need for focused improvement.

Some questions may overlap between the biophysical and technical climate aspects on one hand, and the social and community dimensions on the other hand. For instance, issues like flood risk or heat waves may not only require the input of environmental specialists, inclusion of data from public open sources but also feedback from community experts (e.g. flood communities, Indigenous and other cultural communities,

program participants) to understand how these aspects impact daily life and usage of public spaces. This overlap demonstrates the interdependent relationships and feedback loops between biophysical, social and built systems and ensures a more holistic understanding of the space, combining technical expertise with lived experiences for a holistic and comprehensive evaluation.

For certain intricate questions, particularly those relating to climate resilience aspects such as water quality in public spaces, it may be necessary to enlist the expertise of a contracted specialist. Their advanced knowledge and technical skills ensure that the survey reflects accurate and current data. This holistic approach ensures that the surveys reflect both lived experiences and empirical data, forming a solid basis and baseline for subsequent analyses and decisions.

Moreover, the Embedding Reconciliation questions are designed to interact with the climate resilience and community wellbeing questions, demonstrating these overlapping relationships and providing more relational, community embedded, and holistic lenses of the criteria being assessed. See above diagram: *Mapping Relationships Between Embedding Reconciliation and Climate Resilience + Community Wellbeing Criteria* for a visualization of these relationships. Due to the depth of resilience knowledge and lived experience held by many Indigenous experts, it is strongly recommended that they be engaged for the Embedding Reconciliation questions, as well as many of the climate resilience and community wellbeing questions.

Several questions in this survey, such as "Is the open space accessible to a diversity of communities?", are best answered by engaging directly with community members and users of the open public space. These types of questions rely on lived

experiences and perceptions, which may not be captured through data alone. To gather more nuanced and representative insights, we recommend organizing focus group discussions with a diverse range of community members. This approach allows for a deeper understanding of how different groups interact with the space, their specific needs and any barriers they face. Focus group discussions provide a platform for participants to share their views, fostering an inclusive and participatory process that ensures the survey reflects the perspectives of those most affected by the space.

### Conducting Embedding Reconciliation Questionnaires

When conducting the Embedding Reconciliation sections of the climate resilience and community wellbeing questionnaires, it is important to understand that the **Embedding Reconciliation questions are aspirational** and invite administrators of the tool to view themselves on an ongoing journey of coming into right relationship with the lands and First Peoples where the public space is located. This journey requires recognition, learning, reflection, community engagement and actioning Indigenous inclusive approaches and Truth and Reconciliation commitments – and it should be done in relationship and active collaboration with Indigenous staff, advisors and/or local community.

We understand that organizations and municipalities will be at different stages of their journey, especially with respect to different indicator themes and particular questions. You may even find that compared to the current journey stage for a criteria area, your organization was at a higher stage at an earlier time when different internal conditions like cultural expertise, community relationships and resourcing were available.

You will notice the Embedding Reconciliation Journey Scale (Figure 3 Linear Format) incorporated into the Embedding Reconciliation questions across the questionnaires. Rather than the numerical rating scale assigned to each question (accompanied by a qualitative guiding statement for each number score) in the climate resilience and community wellbeing questions, the qualitative journey scale is provided for assessment of each block of Embedding Reconciliation questions. For readability and brevity, only the titles of the 5 stages of the Embedding Reconciliation Journey Scale are integrated after each criteria area of ER questions e.g. questions for flood resilience (FR18 and FR19) can both be assessed according to the stages of the scale. The qualitative scale measures current levels of Indigenous cultural awareness, learning, experimentation, community engagement, co-creation and leadership, and approach implementation.

While the Embedding Reconciliation questions are specifically designed to incorporate Indigenous-inclusive approaches, embedded Truth and Reconciliation actions and cultural sensibilities, it is equally important to recognize that depending on the context and location of the public space, all local racialized and equity-deserving communities should also be meaningfully engaged. This can involve customizing relevant survey questions and indicators from any section, as well as culturally situating participatory engagement and data collection techniques, to ensure that the perspectives and voices of these communities are integrated into the process.

# Location-based Scoring Methodology

## Climate Resilience & Community Wellbeing Questionnaires

Through analysis of local risks, resilience and wellbeing priorities and geospatial data, we have developed a location-based scoring methodology to support the project selection process. This method consists of normalizing the final score values for each criterion, an optional step to weigh the criteria and a final step to calculate a final score for each site which encompasses all considered aspects of climate and community resilience.

In the scoring card section, tool administrators should synthesize the insights collected from the survey by calculating a normalized score for each criterion. After tallying the actual scores received from the relevant questions, divide this total by the maximum possible score to determine the normalized value. For example, if a site achieves a score of 15 out of a maximum of 40 in the flood resilience category, based on 8 questions with a top score of 5 each, the normalized score for flood resilience would be 0.375. This process standardizes each criterion's score on a scale from 0 to 1, enabling a uniform comparison across different criteria.

### Optional Step

### Weight Evaluation Criteria

While optional, you may also choose to apply a weighted value to each criterion to reflect its relative importance before recording the scores on the scorecard. This standardized and potentially weighted scoring forms the quantitative foundation of your evaluation, allowing for a comprehensive and comparative view of the public space's performance across all criteria.

# Analyzing Qualitative Data + Journey Scale

## Step 7

Organize qualitative data generated by the Embedding Reconciliation questions and detailed notation from questionnaires for enhanced understanding of what the data means and how to assess scores and journey stages in Step 8, including an in-depth look at nuances and patterns or themes emerging from the data, and deducing insights. Grounded analysis and sensemaking from the data can be more inductive and enable collaborative meaning and knowledge making with relevant participant groups, especially Indigenous community participants, transforming data into actionable learning, Reconciliation-based journey progression, and targeted measures. Create a matrix for stages across evaluation criteria to track the current journey and the aspired journey for Embedding Reconciliation Journey Scales from each criteria area across questionnaires,

In depth data analysis will also inform internal learning, program outcomes, and decision-making regarding target measures for improving public spaces and community relationships. Qualitative data collection and metrics are crucial for understanding the lived experiences, perspectives, and needs of Indigenous Peoples and diverse communities – especially when addressing complex issues like climate resilience, cultural revitalization, and inclusion and belonging – as they allow for nuanced data collection and analysis beyond numerical data. Qualitative data can help uncover the root of underlying social, economic, and political factors that contribute to disparities faced by racialized and marginalized communities, informing targeted interventions and policies.

Qualitative data collection methods like interviews, focus groups, and storytelling allow Indigenous and other communities to share their experiences and perspectives in their own words, providing rich insights into their realities. These metrics are more attuned to the diverse cultural contexts and traditions of Indigenous Peoples, ensuring that research and evaluation processes are conducted in a respectful and culturally appropriate manner.

Qualitative metrics can be used to track progress on issues like public space stewardship, flood resilience, community health, and embedding Truth and Reconciliation learning and actions, providing a more holistic and nuanced understanding of building organizational and community capacity and the preparedness of public spaces to adapt and be resilient to climate breakdown and extreme weather events.

Decolonized qualitative research and evaluation methods such as those used in this tool, ensure that research and assessments are not extractive of Indigenous and local knowledges and lived experiences. Rather, methods are designed to give Indigenous Peoples and other racialized communities a voice and agency in research processes, allowing them to shape the questions, methods, and outcomes of studies. Qualitative methods focus on the strengths and resilience of diverse Indigenous and non-Indigenous communities, rather than solely focusing on deficits.

As part of the decolonial work of recentering indigenous wisdoms, lifeways and voices in climate and community resilience, and righting relations with Indigenous Peoples, we envision that non-Indigenous civic and municipal public space stewards are on a journey of truth-telling, learning, reflecting, engaging and co-creating, integrating Indigenous-inclusive approaches, and actioning Truth and Reconciliation commitments. The purpose of the Embedding Reconciliation facet of the questionnaires and methodology is to enable organizations to gauge and understand both their present journey, and their aspirational journeys. Organizations are also invited to be more intentional in their journey to deepen and enhance recognition, learning, reflection, and actioning of Indigenous perspectives and approaches and wider Truth and Reconciliation commitments within the public space they steward.

Aligned with the values of qualitative research and evaluation methods described above, the **Embedding Reconciliation Journey Scale** (Linear format in Figure 3 and Spiral format in Figure 4) is intended to gauge where municipalities and public place stewards are at – and aspire to improve toward – in their journey to integrate Indigenous inclusive approaches and actioning Truth and Reconciliation. It is important to note that the scale is meant to be a reflective and iterative progression through the stages of improved recognition of the value of engaging Indigenous perspectives; emerging awareness; exploration + learning, community engagement and integration of Indigenous inclusive approaches; and co-creation and support of Indigenous community leadership in shaping public spaces. Although there may be varying responses for each specific question in a block, the expectation is that the responses will indicate a common journey stage (or straddling 2 stages) for that criteria area.

Figure 3 represents the qualitative assessment scale in linear format, which has been designed for accessibility and consistency with the climate resilience and community wellbeing location-based scoring method. The scale also reflects the reality that the journey stages are dynamic and not fixed, as well as that many organizations fluctuate along the stages depending on shifting variables such as internal expertise and leadership, policy and strategic prioritization, and funding in areas of Indigenous inclusion and Truth and Reconciliation. As such, a more accurate representation of the scale is captured as a spiral format (Figure 4), where the tool administrator may locate their organization at more than one stage due to shifting variables. For example, an organization may have previous experience, leadership, community relationships, and even an approach in place – however, due to people, strategic focus or policy changes in the organization, the organization must rebuild in these areas to progress through the stages.

Figure 3: Linear Representation of Embedding Reconciliation Journey Scale

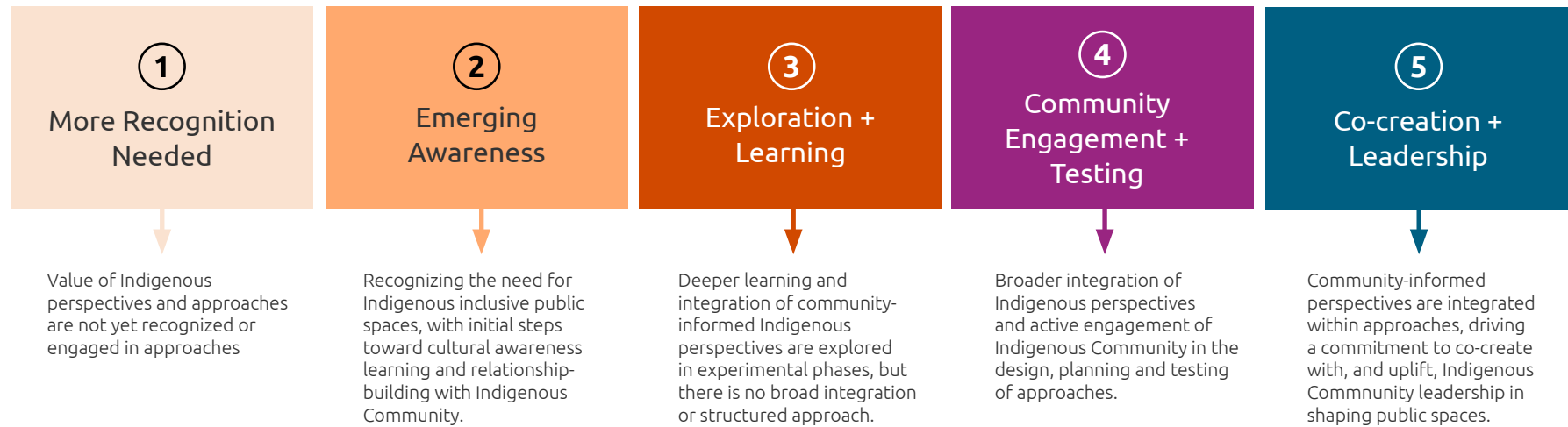
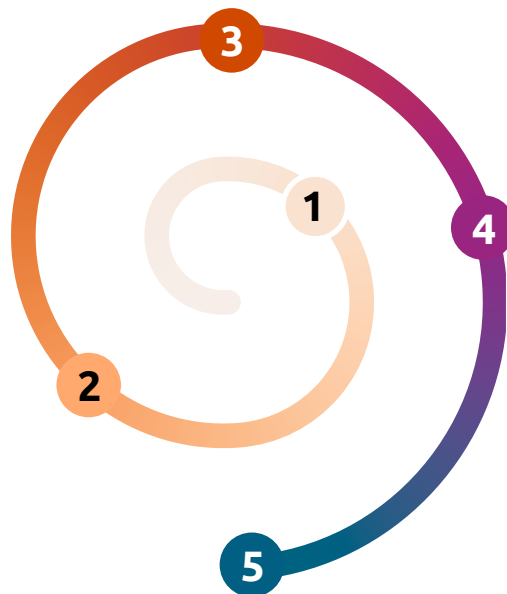


Figure 4: Spiral Representation of the Embedding Reconciliation Journey Scale



<b>1</b>	<b>More Recognition Needed</b>	Value of Indigenous perspectives and approaches are not yet recognized or engaged in approaches
<b>2</b>	<b>Emerging Awareness</b>	Recognizing the need for Indigenous inclusive public spaces, with initial steps toward cultural awareness learning and relationship-building with Indigenous Community.
<b>3</b>	<b>Exploration + Learning</b>	Deeper learning and integration of community-informed Indigenous perspectives are explored in experimental phases, but there is no broad integration or structured approach.
<b>4</b>	<b>Community Engagement + Testing</b>	Broader integration of Indigenous perspectives and active engagement of Indigenous Community in the design, planning and testing of approaches.
<b>5</b>	<b>Co-creation + Leadership</b>	Community-informed perspectives are integrated within approaches, driving a commitment to co-create with, and uplift, Indigenous Community leadership in shaping public spaces.

The baseline expectation is that tool administrators generally know of the Truth and Reconciliation Commission's Calls to Action (2015) and that diverse First Nations, Métis and Inuit and mixed Indigenous urban communities have an interest in and right to be involved in public spaces.

For the journey stages of "Emerging Awareness" through to "Co-creation + Leadership," ongoing cultural awareness learning and fostering trust-based relationships and engagement with Indigenous communities are needed, as well as internal conditions of readiness within the organization. It will be common for many organizations to be at the initial stage(s) on some or most of the Embedding Reconciliation questions due to a need to build organizational learning, relationships and readiness. The purpose of these questions is not to judge but rather, to invite the organization into being more intentional in their journey to deepen and enhance recognition, learning, reflection, and actioning of Indigenous perspectives and approaches and wider Truth and Reconciliation commitments within the public space they steward.

It is important to note that some questions gesture toward very particular and deep forms of Indigenous inclusive approaches and community engagement and are an invitation for the organization to deepen their Embedding Reconciliation journey, aspiring to

build the conditions for improving toward the next stage. It is recommended that each criteria area of Embedding Reconciliation questions be surveyed and assessed together as a means of opening a deeper dialogue among relevant staff and Indigenous community advisors about both the current reality, and the aspirational possibility to which the question gestures.

Although there may be varying responses for each specific question in a block, the expectation is that the responses will indicate a common journey stage (or straddling 2 stages) for that criteria area. For example, responses to Embedding Reconciliation questions for wildfire resilience may indicate an average journey stage of exploration + learning, encouraging the organization to continue their learning journey but focusing more on broader integration of Indigenous wildfire stewardship and integrated forest sustainability approaches in wildlife mitigation and prevention plans. There are numerical values in brackets for each qualitative measure (consistent with the climate resilience and wellbeing questions) as an option for administrators of the tool who may wish to also have a numerical assessment to quickly gauge progress or align scores with the climate resilience and community wellbeing scorecards.

# Calculating Scores

## Step 8

To calculate the overall score for each theme (climate resilience and community wellbeing) a weighted arithmetic mean equation is used. This equation is explained below:

$$\text{Climate Resilience Score} = \frac{(FR \times Wfr) + (DR \times Wdr) + (WQ \times Wwq) + (B \times Wb) + (PQ \times Wpq) + (HR \times Whr) + (WR \times Wwr) + (CM \times Wcm)}{Wfr + Wdr + Wwq + Wb + Waq + Whr + Wwr + Wcm}$$

Where:

*FR = Flood Resilience*  
*DR = Drought Resilience*  
*WQ = Water Quality*  
*B = Biodiversity*  
*AQ = Air Quality*  
*HR = Heat Resilience*

*WR = Wildfire Resilience*  
*CM = Climate Change Mitigation*  
*Wfr = Weight for Flood Risk*  
*Wdr = Weight for Drought Resilience*  
*Wwq = Weight for Water Quality*

*Wb = Weight for Biodiversity*  
*Waq = Weight for Air Quality*  
*Whr = Weight for Heat Resilience*  
*Wwr = Weight for Wildfire Resilience*  
*Wcm = Weight for Climate Change Mitigation*

**Community Wellbeing Score**

$$= \frac{(UQ \times Wuq) + (PG \times Wpg) + (S \times Ws) + (AI \times Wai) + (H \times Wh) + (CE \times Wce) + (DE \times Web)}{Wuq + Wpg + Ws + Wai + Wh + Wce + Web}$$

Where:

*UQ = Urban Quality, Maintenance & Regeneration*  
*PG = Participatory Planning & Governance*  
*S = Safety*  
*AI = Accessibility, Inclusivity & Belonging*  
*H = Health*  
*CE = Community Engagement & Social Cohesion*  
*EB = Direct Economic Benefits*

*Wuq = Weight for Quality, Maintenance & Regeneration*  
*Wpg = Weight for Participatory Planning & Governance*  
*Ws = Weight for Safety*  
*Wai = Weight for Accessibility, Inclusivity & Belonging*  
*Wh = Weight for Health*  
*Wce = Community Engagement & Social Cohesion*  
*Web = Direct Economic Benefits*

# Visualizing Results

## Step 9

With the completion of the scorecard, which evaluates public spaces across the dual themes of climate resilience and community wellbeing, tool administrators can visualize the results in several impactful ways. By utilizing geospatial software (GIS), administrators can spatially represent public spaces in their network, inventory or database with the previously calculated scores, offering a clearer view of how different spaces within the community compare in terms of climate resilience, community wellbeing and embedding conditions for Truth and Reconciliation actions.

This spatial visualization allows policymakers and the public to identify both high-performing areas and those that require more attention or investment. Tool administrators who are looking for another visualization route can use the information gleaned from the public space scores to create infographics and charts to provide a detailed breakdown of scores by public space typology, criteria measured, themes or community locations. Being able to visualize a community's public spaces geospatially with correlated scores provides community members, community leaders, municipal staff and other community participants with the knowledge to better understand where to focus enhancements to ensure an equitable, accessible, climate-resilient and engaged community space.

# Targeting Measures for Improving Public Spaces

## Step 10

The aim of this tool is to support decision-making on which targeted measures should be applied in improving open public spaces. The tool is also designed to guide deeper forms of community engagement and Indigenous inclusion, participatory processes for planning and stewarding open public spaces, embedding the conditions for Truth & Reconciliation actions, and collaborative initiatives in climate resilience and community wellbeing.

Once the score card is completed and results are visualized, the data gathered can be interpreted to strategize possible solutions to tackle location-specific challenges. Wherever a coordinated open public space strategy is being developed, it should emerge from a process of co-design, rooted in local, integrated urban development principles. Therefore, when preparing a plan for targeted measures to enhance public spaces, it is crucial to convene key community partners at the earliest stage and throughout the implementation of the plan. These partners include local government officials, Indigenous communities, urban planners, environmental experts, representatives from community organizations, local business owners and community members living and working in the area.

### **Linking Scores to Typologies for Nature-based Solutions and Embedding Reconciliation Outcomes**

**Nature-based Solutions (NBS)** provide an example of targeted climate resilience measures that can be implemented to improve open public spaces. Site-specific scoring helps tailor NBS interventions to each space's environmental and social context, leveraging nature to boost urban resilience and wellbeing. For example, planting trees not only sequesters carbon but also reduces flood risks and provides shade relief in extreme heat events when positioned strategically.

To support this linkage, Dark Matter Labs has been working towards developing a shared language to understand NbS as a critical step to appreciate nature as an asset class and support impact and cost modeling. The NbS projects are defined based on their stage, activities and biophysical characteristics. [TreesAI NbS framework](#) currently includes 20

NbS typologies categorized into four macro-typologies: Tree, Sustainable Drainage Systems (SuDS), Green Open Space (Gardens) and Building Structures.<sup>22</sup>

**To note:**

- NbS typologies are not comprehensive, they are a subset of the diverse array of open spaces that can be integrated into communities. Many other critical ecosystems such as coastal mangroves, peatlands and riparian woodlands also offer significant environmental and social benefits.
- These typologies simplify complex typologies and do not fully address the nuanced interactions between design, location and community dynamics that influence the ultimate success and functionality of these interventions.
- The ability of these interventions to provide these benefits is dependent on their (often costly) maintenance.

With your completed scorecard, you can compare public spaces within a region, city or community, identify underperforming areas of climate resilience and find NbS typologies to improve scores. For example, if a public space scores low in flood resilience, the NbS Typologies and Environmental Benefits table in Annex 4 can suggest solutions to enhance its climate resilience. Although there's no direct correlation between a public space score and a specific NbS, the scores help understand overall climate resilience and guide the selection of NbS typologies for weaker areas. The table in Annex 4 links examples of NbS typologies to their environmental benefits, depending on their design and implementation. For more details on NbS and learnings from TreesAI, see the [Glasgow Pilot Learning Report](#) which explores nature as a critical and investable part of urban infrastructure.

For the work of embedding Indigenous-inclusive approaches and Truth and Reconciliation actions within public spaces and their stewardship, the **Embedding Reconciliation Actions + Community Outcomes** in Annex 5 provides examples of place-based targeted measures that can be implemented to also contribute to wider community outcomes. The typologies are consistent with the indicators and questions for embedding Indigenous inclusive public space and Truth and Reconciliation actions across the climate resilience and community wellbeing questionnaires – and are importantly linked to impactful Indigenous community outcomes. For organizations and municipalities, the typology illustrates how the tool is intended

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22. Typologies were adapted from the IUCN Global Standards for Nature-based Solutions (2020) as an overarching guideline and core terminology drawn from ThinkNature's NbS framework. To learn more about the framework to classify NbS typologies, check the TreesAI learning report chapter "Step II: Define NbS."

to be more than a guided exercise in evaluating public spaces for their ability to include Indigenous community and expertise, resilience and wellbeing approaches, and programming.

The typology invites informed and intentional learning and reflection, and relationship + trust-building and co-creation with Indigenous communities. It also invites committed actions toward Indigenous inclusive design and planning and coming into right relationship with the land and First Peoples. When public space stewards are actively working in multiple ways toward the typologies while they move along their own learning and action journeys, there can be immense value for urban Indigenous communities, as well as the wider society.

Due to the holistic, interconnected and relational nature of diverse Indigenous understandings and approaches to land, health and wellbeing, leadership, placekeeping and culture – each embedding reconciliation typology action correlates to and supports other actions; and each action strengthens multiple community outcomes. For example, the ER typology action of *Integration of Indigenous land-based + climate knowledges and stewardship* is interconnected with both *Protection + regeneration of sacred sites and species at risk* and *Integration of community-based monitoring methods* – and in contributes to all community outcomes.

The outcomes featured in the typology are consistent with areas for strengthening Indigenous climate and community resilience outcomes<sup>23,24</sup> i.e. community health and resilience, community engagement and leadership, land relationships, Indigenous knowledge integration, Indigenous-inclusive design and planning, Indigenous knowledge integration, and cultural revitalization. These outcomes also link to the thematic bundles from the *Mapping relationships between Embedding Reconciliation indicators and criteria of climate resilience and community wellbeing* diagram. They can be implemented and actualized with Indigenous community partners and advisors to improve open public spaces in ways that reinforce social, ecological and place-based resilience; and carry deep and lasting forms of value for Indigenous and non-Indigenous communities.

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23. Reed et al. (2023). For Our Future: Indigenous Resilience Report. [https://changingclimate.ca/site/assets/uploads/sites/7/2024/03/Indigenous-Resilience-Report\\_Final\\_EN.pdf](https://changingclimate.ca/site/assets/uploads/sites/7/2024/03/Indigenous-Resilience-Report_Final_EN.pdf)

24. Municipal Climate Change Action Centre. Indigenous Climate Resilience Resource Hub. <https://mccac.ca/wp-content/uploads/Indigenous-Climate-Resilience-Resource-Hub.pdf>

# Indigenous Data Sovereignty + Data Management

## Step 11

Data can tell powerful stories of people's knowledges, experiences, relationships with land and place, and of their histories and their futures and are therefore a necessary component in the agency and self-sovereignty of First Peoples – from traditional knowledge passed down through oral storytelling, to the records kept by governments and institutions. Keeping the power of that data, and the stories it encodes, under Indigenous stewardship is the practice of data sovereignty. Due to the colonial and exploitative relationships and practices imposed on Indigenous data and information and how they are collected and used – regional, national and global Indigenous data sovereignty movements have become increasingly prominent in asserting Indigenous Peoples' inherent and unalienable rights to self-determine and protect their data and digital pathways.

While Indigenous data sovereignty varies across Nations and global regions, and does not reflect a pan-Indigenous data governance and management model, the rights and interests of Indigenous Peoples relating to the collection, ownership, stewardship and application of data underpin all Indigenous data sovereignty models. In Canada, Indigenous knowledge systems and traditional cultural expressions are collectively held and not the domain of any individual person and are therefore protected under various Indigenous<sup>25</sup>, national<sup>26 27</sup> and international<sup>28 29</sup> regulatory and legal frameworks. As with all individuals in Canada, protection of data and information about First Nations, Inuit and Métis individuals (including the sharing of data by non-Indigenous governments and institutions) is also ensured under the federal Privacy Act in Canada and is undergoing an extensive nation-to-nation engagement with Indigenous Nations and potential expanded approach<sup>30</sup>. In academic and community research

contexts, a Canada Research Coordinating Committee of Tri-Agency Research Institutes worked with Indigenous researchers, Knowledge Keepers and community members to develop and enact an Indigenous Research Protocol and Strategic Plan, now called the Extension of Strengthening Indigenous Research Capacity Strategic Plan to 2026.<sup>31</sup>

Before any surveys and interviews are conducted, a few fundamental steps include a thorough engagement with the OCAP® Principles and training modules<sup>32</sup> (and other context-relevant protocols and research ethics) to understand how Indigenous information and data are to be collected, protected, used, or shared; and respect for Indigenous Peoples' right to free, prior and informed consent about their data.<sup>33</sup> Open space stewards should work with an Indigenous advisor to establish the most relevant protocol for storing and protecting qualitative

community and cultural data and other documentation during the processes of data collection and integration. It is important to ensure that all collected community data is shared back with relevant individuals and organizations, and that stored data is in an encrypted program, not accessible to anyone but the trusted project lead who is responsible for Indigenous Community engagement.

Another important step is to understand the vital role that Canada's UNDRIP Act Action Plan<sup>34</sup> has as a regulatory tool for Indigenous Peoples to advance local and national Indigenous data sovereignty work, especially through establishment of legal principles underlying collective and individual data rights in the context of UNDRIP. Working with Indigenous staff and/or advisors to establish relevant data management considerations and protocols consistent with accountabilities is essential

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25. First Nations Information Governance Centre. (2013). Ownership, Control, Access and Possession (OCAP): The Path to First Nations Information Governance.
  26. Innovation, Science and Economic Development Canada. Indigenous Peoples and Intellectual Property. <https://ised-isde.canada.ca/site/intellectual-property-strategy/en/indigenous-peoples-and-intellectual-property>
  27. Free, Prior and informed Consent Factsheet. Endorsed by Amnesty International Canada, Assembly of First Nations, Canadian Friends Service Committee (Quakers), Chiefs of Ontario, et al.
  28. CARE Principles for Indigenous Data Governance, <https://www.gida-global.org/care>
  29. UN General Assembly. (2007). United Nations Declaration on the Rights of Indigenous Peoples: resolution / adopted by the General Assembly, A/RES/61/295. <https://www.refworld.org/legal/resolution/unga/2007/en/49353>
  30. Justice Canada. Privacy Act Modernization: Engagement with Indigenous Partners – What We Have Learned (so far) and Next Steps. <https://www.justice.gc.ca/eng/csj-sjc/pa-lprp/wwh3-cqnae3/part1-partie1.html> A modernized Privacy Act is anticipated to better support Reconciliation with First Nations, Inuit and Métis in Canada by establishing more comprehensive and collective data privacy protection for Indigenous Nations and governments.
  31. Canada Research Coordinating Committee. Setting new directions to support Indigenous research and research training in Canada. <https://www.canada.ca/en/research-coordinating-committee/priorities/indigenous-research/strategic-plan-2019-2022.html>
  32. OCAP® is a registered trademark of the First Nations Information Governance Centre ([www.FNIGC.ca/OCAP](http://www.FNIGC.ca/OCAP))
  33. Free, Prior and informed Consent Factsheet. Endorsed by Amnesty International Canada, Assembly of First Nations, Canadian Friends Service Committee (Quakers), Chiefs of Ontario, et al.
  34. The United Nations Declaration on the Rights of Indigenous Peoples Act Action Plan. (2023). Department of Justice Canada. <https://www.justice.gc.ca/eng/declaration/ap-pa/ah/pdf/unda-action-plan-digital-eng.pdf>

before undertaking data collection with Indigenous participants, especially in the Embedding Reconciliation sections of the questionnaires.

We recommend that an organization consider co-developing data sharing agreements<sup>35</sup> aligned with OCAP Principles and/or other context-specific data sovereignty protocols with Indigenous advisors and Knowledge Keepers. This is a sign of respect for and protection of the intellectual property (i.e. traditional knowledge systems and cultural expressions) and data sovereignty of Indigenous Nations and individual Knowledge Keepers. These agreements should clarify what Indigenous data will be shared and in what form and to what audience, how data and knowledge may or may not be used, and acknowledgement that these are not to be extracted from people or community but rather, the reciprocal role that research and evaluation leads have in contributing back to Indigenous Peoples in ways that uplift them.

Our Data Indigenous APP is a free digital tool for Indigenous communities and allied organizations interested in working with Indigenous communities to collect, analyze, steward and archive their own data on a range of topics from climate impacts to community health.<sup>36</sup> The app was developed in collaboration with the Environmental Conservation Lab at the University of Manitoba as part of the project Kitatipithitamak

Mithwayawin with Indigenous partners, technology and subject specialists and researchers, and First Nations advisory councils. Tool administrators can develop and share surveys on the web dashboard (accessible on any internet browser) and shared surveys can be accessed on the digital app.

While some community-level data and studies by non-Indigenous researchers have helped with setting goals and planning in areas like health, education, and technology, most research by non-Indigenous institutions has not been useful or aligned with the priorities of Indigenous communities.

Access to the complete data and information about an Indigenous Nation's citizens, lands, waters, culture, language, economy, natural resources, etc., is critical to good governance, community wellbeing and sustainability, however, that jurisdiction must remain with that Nation or appropriate community leadership. The Data Governance and Management Toolkit for Self-Governing Indigenous Governments underscores that Indigenous leadership and direct involvement in the management and governance of their data supports more consistent and credible data that have direct value and benefit for present-day communities, while also protecting Indigenous worldviews and lifeways for future generations.<sup>37</sup>

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35. The Alberta First Nations Information Governance Centre provides template language for an agreement and key factors to consider. <https://afnigc.ca/wp-content/uploads/2024/06/Data-Sharing-Agreement-Full-2024.pdf>

36. Our Data Indigenous App. University of Manitoba. <https://ourdataindigenous.ca/about-the-app/>

37. Data Governance and Management Toolkit for Self-Governing Indigenous Governments <https://indigenousdatatoolkit.ca/>

# Evolving Strategies Toward Wise Practices

## Step 12

Use detailed assessments and visual data to track organizational strengths, areas for improvement, advancing Nature-based Solutions, learning and actioning Truth and Reconciliation, and creating compelling visioning and funding proposals to showcase the multiple benefits of proposed improvements. This structured approach is an effective way to improve and develop wise practices, and underscores the tool's capacity to be periodically re-evaluated, allowing for the iterative.

Another area of focus for leveraging the tool to build wise practices relates to the long-term political, financial and social investment and sustainability of open spaces, especially by municipalities, civic leadership, businesses and community groups. Although building resilience in communities is central to addressing both multi-level climate challenges, and the regenerative wellbeing and future of cities, there is a major investment gap by both the public and private sectors in the creation, programming, stewardship and maintenance of open public spaces to this challenge. Parks, streets, green corridors, and community spaces are frontline infrastructures in the face of climate impacts, supporting everything from flood mitigation to cooling, social cohesion, and health. Yet these spaces are often underfunded, undervalued, and left out of long-term investment plans.

The societal costs are levied on residents (especially racialized and historically marginalized communities and groups), local authorities, and future generations – and the financial risks associated with not addressing this gap is much higher. These costs show up as infrastructure damage, burden on health and social systems, and livelihood and economic disruptions. For instance, a 2018 study by the Global Commission on the

Economy and Climate found that investing \$1.8 trillion in climate resilience measures could generate \$7.1 trillion in net benefits by avoiding future damages, including those from extreme weather events.<sup>38</sup> To fill this gap, there is a need to explore innovative and collaborative new financing mechanisms, as is already being done across the globe (for some examples see the [Urban Governance Atlas](#)).

One of the key shifts seen is the need to move from financing on a project-by-project basis to portfolio financing, which provides revenue options at the neighborhood or city scale. To do this effectively, tool administrators need to ensure baseline monitoring and subsequent monitoring, reporting and verification strategies to manage the NbS assets that will be created, providing evidence of benefits, and building the long-term evidence case. To learn more about how TreesAI approaches portfolio building, read [TreesAI Learning report 1](#).

By using this multifaceted tool, open space developers and stewards (whether an organization, municipality, business, community group or an interested individual) can begin to make the case for investing long term and systemically in place, climate and community wellbeing, and right relationships.

### Link to Sustainable Development Goals:

By aligning the tool with the Sustainable Development Goals (SDGs) and their specific targets, it allows coincidence with an internationally recognized framework to address critical aspects such as urban quality, inclusivity, health, economic benefits and environmental sustainability. By integrating these global goals, the tool enhances its relevance and applicability, while facilitating benchmarking and progress tracking against global standards and a growing global evidence base. Each criterion, such as flood resilience, air quality and health, is linked to the two most relevant SDGs and their specific targets within each goal.

It is important to acknowledge the limitations of the SDGs, including their broad scope, potential for differing interpretations and the challenge of addressing local specificities within a global framework. Despite these limitations, the SDGs offer a valuable guiding framework for fostering sustainable urban environments.

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38. Global Commission on the Economy and Climate. "Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times," 2018

Table 2: SDG Linkages with Climate Resilience, Community Wellbeing and Embedding Reconciliation Criteria

Climate Resilience		
Criteria	SDG	Target
Flood Resilience	SDG 11: Sustainable Cities and Communities	Target 11.5 Reduce the number of deaths and the number of people affected and decrease the direct economic losses relative to GDP caused by disasters.
	SDG 13: Climate Action	Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
Drought Resilience	SDG 6: Clean Water and Sanitation	Target 6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity.
	SDG 13: Climate Action	Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
Water Quality	SDG 6: Clean Water and Sanitation	Target 6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing the release of hazardous chemicals and materials.
	SDG 15: Life on Land	Target 15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services.
Biodiversity	SDG 15: Life on Land	Target 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent the extinction of threatened species.
Air Quality	SDG 3: Good Health and Well-being	Target 3.9 Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
	SDG 11: Sustainable Cities and Communities	Target 11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
Heat Resilience	SDG 11: Sustainable Cities and Communities	Target 11.5 Reduce the number of deaths and the number of people affected and decrease the direct economic losses relative to GDP caused by disasters.
	SDG 13: Climate Action	Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
Wildfire Resilience	SDG 13: Climate Action	Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
	SDG 15: Life on Land	15.2 Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and increase afforestation and reforestation globally
Climate Change Mitigation	SDG 13: Climate Action	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning systems.
	SDG 11: Sustainable Cities and Communities	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

Community Wellbeing		
Criteria	SDG	Target
<b>Urban Quality, Maintenance and Regeneration</b>	SDG 11: Sustainable Cities and Communities	Target 11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management.
	SDG 9: Industry, Innovation and Infrastructure	Target 9.1 Develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being.
<b>Participatory Planning &amp; Governance</b>	SDG 16: Peace, Justice and Strong Institutions	Target 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.
	SDG 11: Sustainable Cities and Communities	Target 11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management.
	SDG 10: Reduced Inequalities	Target 10.2 Empower and promote the social, economic and political inclusion of all.
<b>Safety</b>	SDG 11: Sustainable Cities and Communities	Target 11.: Provide universal access to safe, inclusive and accessible green and public spaces.
	SDG 16: Peace, Justice and Strong Institutions	Target 16.1 Significantly reduce all forms of violence and related death rates everywhere.
<b>Accessibility, Inclusivity, and Belonging</b>	SDG 10: Reduced Inequalities	Target 10.2 Empower and promote the social, economic and political inclusion of all.
	SDG 11: Sustainable Cities and Communities	Target 11.7 Provide universal access to safe, inclusive and accessible green and public spaces.
<b>Health</b>	SDG 3: Good Health and Well-being	Target 3.4 Reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.
<b>Community Engagement and Social Cohesion</b>	SDG 11: Sustainable Cities and Communities	Target 11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management.
	SDG 16: Peace, Justice and Strong Institutions	Target 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.
<b>Direct Economic Benefits</b>	SDG 8: Decent Work and Economic Growth	Target 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation.
	SDG 9: Industry, Innovation and Infrastructure	Target 9.3 Increase the access of small-scale industrial and other enterprises to financial services, including affordable credit and their integration into value chains and markets.

## Embedding Reconciliation

Criteria	SDG	Target
<b>Indigenous land and climate stewardship and monitoring</b>	SDG 15: Life on Land	Target 15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services. Target 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent the extinction of threatened species. Target 15.9 Integrate ecosystem and biodiversity values into national and local planning
	SDG 13: Climate Action	Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries..
<b>Cultural revitalization and community health</b>	SDG 4: Quality Education	Target 4.7 Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including through sustainable lifestyles...and appreciation of cultural diversity and of culture's contribution to sustainable development.
	SDG 3: Good Health and Wellbeing	
<b>Engagement with Indigenous community and leadership</b>	SDG 13: Climate Action	Target 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management
	SDG 16: Peace, Justice and Strong Institutions	Target 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.
<b>Indigenous inclusive and culturally safe design and planning</b>	SDG 11: Sustainable Cities and Communities	Target 11.7 Provide universal access to safe, inclusive and accessible green and public spaces.
	SDG 10: Reduced Inequalities	Target 10.2 Empower and promote the social, economic and political inclusion of all.

# Tips for Using the Tool



## Focus on Long-term Equity by Focusing on Strategic Maintenance

Due to the deeply embedded spatial inequities in most Canadian and global cities based in underlying processes of privilege and power linked to property value and systemic racial and class biases in municipal and land use planning, the existence of, and access to, green spaces is not distributed evenly across communities. Investing in the most vulnerable areas is a question of social and ecological justice, as explored in two Toronto neighbourhoods by a number of community and York University researchers;<sup>39</sup> and by American Forests through their [Tree Equity approach](#). Consider not only a project's development but its long-term social impacts, strategic maintenance, and sustainability.

## Catalyze Collaborative Approaches

Collaboration should exist within and across diverse communities and community groups, Indigenous Communities, local land/water/wildlife stewardship and restoration groups, resilience networks and municipal departments, so that everyone's voice is heard. Partnering with environmental and academic organizations alongside community groups and government staff can help to

build the sort of public-private-civic partnerships that are needed when intervening in public spaces.

Opportunities for community involvement exist throughout the process of this tool but ideally should begin early on, either through participatory planning and design, citizen science projects or through surveys, workshops and public forums to gather diverse inputs and build ownership of the process. Moreover, the tool can be used as an educational resource to increase public awareness about the importance of open spaces for climate resilience and community satisfaction. For more on this you can read a forthcoming report on engaging communities through data-enabled tools found on [Trees AI's website](#).

## Create Effective and Efficient Technological Infrastructures

Utilize GIS (Geographic Information Systems) to accurately map open spaces, analyze spatial data and ensure you are digitally collecting the data, which can then use data analytics tools to process and interpret large datasets, enabling more nuanced insights and predictions. These insights should ideally demonstrate

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39. Hassen, D'Souza, Khan, Das, Arizala, Grey & Flicker (2022). Park Perceptions and Racialized Realities in Two Toronto Neighbourhoods. Community Report.

improved social, infrastructural and ecological impact and return on investment to appeal to a wide range of funders, including government agencies, philanthropic foundations and corporate sponsors. To grow the legitimacy and credibility of the tool and to lay the foundations for civic tech initiatives, this data should be as open as possible. When Indigenous Community is engaged, necessary data sovereignty precautions and community advising must be sought regarding protection and digital custodianship of Indigenous People's knowledge and data.<sup>40</sup>

### The Tool Is A Process, Not A Product

This tool can be used to get a snapshot of what exists today, but the evaluation process should be iterative and inspire an ongoing loop of learning, reflection and adaptation. Regularly update the tool and its methodologies based on feedback, new data and changing conditions and encourage ongoing monitoring and reassessment of open spaces to adapt to community needs and environmental changes.

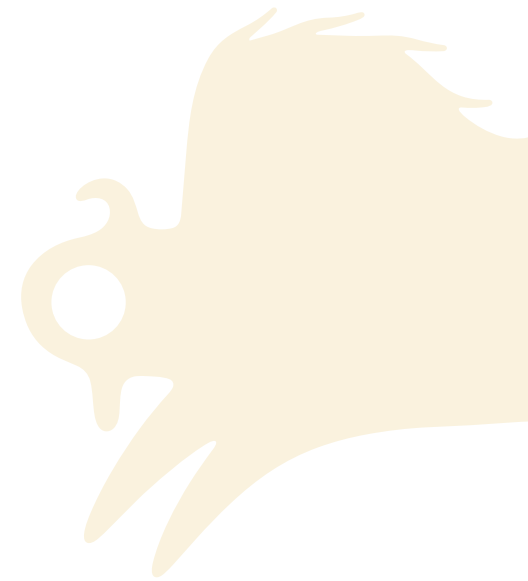
Indigenous community engagement, Indigenous-inclusive approaches and collection of Indigenous data and knowledges must observe and align with the relevant cultural and data sovereignty protocols of each community, individual or organization engaged. The [\*Civic-Indigenous Placekeeping and Partnership Building Toolkit\*](#),<sup>41</sup> [\*Championing Indigenous Inclusion and Leadership Guide\*](#)<sup>42</sup> are resources that can guide learning, reflection and action and understanding of diverse First Nations, Inuit and Métis protocols, principles and approaches in different city building, Place Keeping, land stewardship and innovation contexts.

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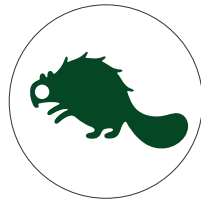
40. Diviacchi, T. (2023) "Indigenous Data Sovereignty and Open Data," PLOS Blog: PLOS ONE. <https://everyone.plos.org/author/tdiviacchi/>

41. Chung-Tiam-Fook, T. (2021). Civic-Indigenous Toolkit on Placekeeping and Partnership Building, Evergreen. <https://evergreen.ca/resource-hub/resources/civic-indigenous-placekeeping-and-partnership-building-toolkit/>

42. Chung-Tiam-Fook, T. (2024). Championing Indigenous Inclusion and Leadership Guide for Tech and Innovation (transferable across sectors and fields of practice). <https://synonymous-poinsettia-e1a.notion.site/Championing-Indigenous-Employment-Leadership-A-Guide-for-Tech-Innovation-Media-Kit-10a826bf5fac809eaaf6c4c7d17baaac>



# Glossary



## **Baseline Monitoring**

The initial collection of data to establish a reference point for future assessments.

## **Biodiversity**

The variety of plant and animal life in a particular habitat, crucial for maintaining ecological balance.

## **Climate Resilience**

Climate resilience describes the capacity of social, ecological and economic systems to anticipate, prepare for, adapt to, and recover and transform from a trend of disruption or extreme weather event, and its associated negative impacts; where the system “is able to respond or reorganize in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation and learning and transformation.”<sup>43</sup>

## **(Indigenous) Community-Based Monitoring**

Based on millennia of Indigenous Peoples’ traditional practices to look, listen and learn from the land, Indigenous land-based knowledge provides place-based, integrated, and unique knowledge and insights into changing ecological and climatic conditions --and is a crucial part of Indigenous climate/ecological/

water monitoring initiatives. Community-based monitoring is led by Indigenous researchers and knowledge keepers, and often weaves together traditional ecological and cultural knowledges and methods with western technoscientific methods. It for the benefit of their Nation and communities.

## **Community Wellbeing**

This social dimension of resilience, which features the multifaceted role of public spaces in promoting a cohesive, vibrant and healthy community life, underlies the importance of integrating public needs and voices in the planning and management processes to maximize their positive impact. The criteria considered for the tool refer to the public space’s ability to enhance urban quality, ensure effective maintenance and regeneration and foster participatory planning and governance, thereby creating safe, accessible and inclusive environments.

## **Cultural Heritage**

In the context of open public space, cultural heritage refers to the preservation, representation and celebration of a community’s historical, cultural and social identity within a public setting. This includes both tangible (physical structures, monuments, sculptures, or historical landmarks) and intangible (traditions,

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43. Annex II - Glossary - Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.”2022. Intergovernmental Panel on Climate Change. [https://archive.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5AnnexII\\_FINAL.pdf](https://archive.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5AnnexII_FINAL.pdf).

customs and community events ) elements that connect people to their past, traditions and shared values.

### **Ecosystem Services**

The benefits people obtain from ecosystems, such as clean air, water, food and recreation.

### **Embedding Reconciliation Indicators**

These aspirational measures for capturing Indigenous land-based, cultural and community-based monitoring considerations and Truth and Reconciliation learning and action journeys in questionnaires and data collection and evaluation – are analogous to climate resilience and community wellbeing criteria. They call on public space leaders to acknowledge Indigenous ancestral and treaty homelands that overlay public space areas and work with local Indigenous communities to create spaces that are inclusive of Indigenous cultures and land stewardship and shared futures.

### **First Nations**

First Nations are among the First Peoples of Turtle Island and are distinguished as ethnically different from Inuit and Métis. They comprise many Status and Non-Status Indigenous Peoples across Canada. First Nations Peoples identify themselves by the nation to which they belong (e.g. Anishinaabek, Cree, Mohawk and Oneida) and their home community or Band (e.g. Fort William First Nation or Attawapiskat First Nation). First Nations peoples continue to be legally defined under the 1982 Constitution Act and other Canadian legislation as “Indians” but this term is considered offensive and inaccurate by many Indigenous Peoples.

### **Geographic Information Systems (GIS)**

A specific computer-based technology within geomatics, for capturing, analyzing, displaying and interpreting spatial geographic data.<sup>44</sup>

### **Indigenous Data Sovereignty**

Indigenous data sovereignty is defined by the Department of Indigenous Studies at the University of Toronto as “the ability for Indigenous Peoples, communities and Nations to participate, steward and control data that is created with or about themselves.” The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), which upholds the inherent and inalienable rights of Indigenous Peoples, is an important regulatory tool in recognizing and advancing the rights of Indigenous Peoples globally and is crucial to Indigenous data sovereignty in research and assessment processes. At the core of Indigenous data sovereignty, are the rights of Indigenous Peoples to collect, own, store, and use the data collected about and with Indigenous Peoples, including information about Indigenous knowledge systems, territories, cultures and lifeways.

Prominent Indigenous data sovereignty protocols in national and international contexts are the *OCAP*<sup>®</sup> *Principles* and training (Ownership, Control, Access, and Possession) of information and data by the First Nations Information and Data Governance Centre; the *CARE Principles* (Collective benefit, Authority to control, Responsibility, and Ethics) for Indigenous Data Governance; and the *FAIR Principles* (Findable, Accessible, Interoperable, and Reusable) promote open access to data.

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44. GIS (Geographic Information System). (n.d.). National Geographic Education. <https://education.nationalgeographic.org/resource/geographic-information-system-gis>

## Indigenous Knowledges

Indigenous knowledges are place-based, relational and intergenerational, emergent from the particular ecologies and spatial and trans-temporal relationships and wisdoms that people have woven over deep time. Indigenous knowledge systems are embedded in relationship to specific lands, histories, worldviews, languages and communities. There are thousands of complex systems of knowledge, codified forms of communication and creative and innovative productions unique to particular Indigenous communities, cultural systems, homelands and global contexts and that span millennia.

*Naturalizing Indigenous knowledge* is a process of deep learning from, naturalizing and inculcating Indigenous worldviews and knowledge systems and making them evident to transform spaces, places, curricula, pedagogies, policies and practices. *Braiding knowledge systems* can be understood as an intentional weaving together of two distinct knowledge systems so that learners can come to understand and appreciate the holistic richness and effectiveness of bringing together both Indigenous and non-Indigenous knowledges and worldviews.

## Indigenous Land Stewardship (including water and biodiversity stewardship)

Through shared philosophies of interconnectedness between all of life and that all beings, landscapes and elements of the cosmos have inherent value, agency and self-sovereignty – Indigenous cultures across the world understand more-than-human entities to be kin and maintain a deeply equitable and relational

ethos of “all our relations.” In caring for more-than-human kin, Indigenous communities have intentionally and regeneratively stewarded their homelands for millennia, cultivating, adapting, and transferring ecological and cultural knowledge over many generations. Indigenous community stewards include Elders and Knowledge Keepers, youth, land and water defenders, Earth workers, water protectors, environmental scientists, biologists, and educators, often braiding Indigenous and western scientific and cultural knowledges to create holistic, robust knowledges and rigorous practices. This expansive reservoir of knowledge, wisdom and interconnectivity to land enable Indigenous communities to be vital and resilient, as well as these wise and relational practices encourage the land and culturally significant species to be more productive. Global assessments of biodiversity and ecosystem health have consistently found that Indigenous stewarded and conserved areas have relatively high levels of species, ecosystem and endemic biodiversity, and less severe or avoided impacts than areas.<sup>45 46</sup>

## Nature-based Solutions (NBS)

Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefitting people and nature.<sup>47</sup>

## Open Public Space

An open public space is defined as an area of open land in an urban, suburban, or peri-urban setting that is accessible to the public and often vegetated. Examples include public squares, parks, gardens, outdoor gathering and activation spaces,

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45. United Nations (2022). United Nations Global Assessment Report on Biodiversity and Ecosystem Services

46. Indigenous Conserved and Protected Areas. <https://conservation-reconciliation.ca/about-ipc-as>

47. <https://www.iucn.org/our-work/nature-based-solutions#:~:text=Nature%2Dbased%20Solutions%20address%20societal,biodiversity%20and%20human%20well%20being>

greenways, natural reserves, parkettes (such as those in Toronto), public green roofs, arboretums, botanical gardens and community gardens.

### **Participatory Planning**

The processes by which plans and decisions are made with the full participation of the communities they will impact – in a way that is accessible, collaborative and meaningful.<sup>48</sup>

### **Place Keeping (or Placekeeping)**

A form of engagement that prioritizes land-based, cultural, relational, and historical connectivity, care for, and shaping of 'place'; and unsettles shared public spaces to bring presence of Indigenous histories and futures into focus.

### **Placemaking**

The process of working together to shape and create public spaces, bringing together diverse people to plan, design, manage and program shared-use spaces.

### **Portfolio Financing**

A financial strategy that involves funding a collection of projects as a group to improve resilience at a larger scale, such as a neighborhood or city.

### **Public Space Inventory (PSI)**

A digital tool developed to assess public spaces in cities and identify gaps for the development of long-term public space strategies and policies. It utilizes a digital questionnaire that can be contextualized to fit different contexts and priorities.<sup>49</sup>

### **Resilience-Based Vulnerability Assessment**

An evaluation method that analyzes how climate change will impact specific systems and their complex interrelationships (like communities, ecosystems, or infrastructures); and identifies ways for those systems to build internal resilience, adapt and mitigate impacts. These assessments involve evaluating a system's exposure to climate threats and socioeconomic and cultural factors, its sensitivity to those hazards, and its capacity to adapt.

### **Two-Eyed Seeing/Etuaptmuk**

A teaching championed by Mi'kmaq Elder Albert Marshall, which speaks to the integration of two or more perspectives (i.e. Indigenous and non-Indigenous worldviews) to create a holistic understanding of complex and multifaceted relationships, experiences, content and processes.

### **Sustainable Development Goals (SDGs)**

A set of 17 global goals established by the United Nations to address a range of issues, including poverty, inequality, climate change, environmental degradation, peace and justice.

### **Typology**

A classification system used to organize items, concepts, or phenomena into distinct groups based on shared characteristics, allowing for analysis, comparison, and understanding. The two typology frameworks included in this tool categorize: nature-based solutions and environmental benefits, and embedding reconciliation actions and community outcomes.

### **Urban Regeneration**

The process of improving and revitalizing urban areas to address complex and often intersecting social, economic and environmental challenges.

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48. City Builders Glossary – Evergreen Resource Hub. Evergreen Resource Hub. <https://www.evergreen.ca/learn-and-discover/city-builder-glossary/>


49. Mutai, J. (2020). Citywide public space inventory and assessment tool, Global Public Space Programme, UN-Habitat. [https://urbanmaestro.org/wp-content/uploads/2021/03/urban-maestro\\_-city-wide-public-space-inventory-and-assessment-tool\\_j-mutai.pdf](https://urbanmaestro.org/wp-content/uploads/2021/03/urban-maestro_-city-wide-public-space-inventory-and-assessment-tool_j-mutai.pdf)


## About Evergreen

Evergreen is a national non-profit transforming public spaces in our cities to build a healthier future for people and our planet.

 [evergreen.ca](https://evergreen.ca)


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## About Dark Matter Labs

Dark Matter Labs is working to create institutions, instruments and infrastructures for more equitable, caring and regenerative futures. Recognising the complex, entangled reality of living systems, we are exploring alternative pathways for organising society and stewarding the shared planetary commons.

**Trees As Infrastructure (TreesAI)** is establishing nature as a critical part of urban infrastructure, alongside bridges, roads and rail, enabling investment, profitability and sustainability. Urban forests regulate a number of ecosystem processes and provide tangible and intangible benefits vital for living environments.


**7GenCities** is a collaborative initiative to co-build flourishing long-term futures with Indigenous and other civic imagineers to create inclusive, reconciliation-centered, and future-fit social, civic, green, economic and legal infrastructures needed for urban communities and bioregions to thrive.

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## Embedding Resilience and Reconciliation: A Tool for Open Public Spaces



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