Geographic Scale in AI Governance Report

RESEARCH STRENGTHS, GAPS, AND POLICY IMPLICATIONS

RENÉE E. SIEBER
ANA BRANDUSESCU

SSHRC KNOWLEDGE SYNTHESIS GRANT

MAY 2026

Executive Summary

Artificial intelligence (AI) is revolutionizing society, work and government. Governments worldwide are proposing models of AI governance to achieve the right balance of regulation and innovation to ensure a thriving economy. The report offers a timely and urgent literature review of AI governance and its implications for geographic scale, synthesizing knowledge on research strengths and research gaps across global, national, and subnational jurisdictions. Scale in AI governance is studied in multiple disciplines and practices, including computer science, which is closely tied to market ideals of "scaling up" such as increased computational power and efficiency. In law, scale is conceptualized as jurisdictions rooted in legal frameworks. The discipline of geography is helpful because it rejects the strict delineation of space as solely jurisdictional, captures flows and influence among jurisdictions, and better aligns with the transjurisdictional nature of AI. A political economy lens supports the close examination of governments' roles as opposed to more dominant discourses that emphasize private sector actors.

Objectives

The report provides a critical review and analysis of research strengths and gaps in AI governance at scale. It pierces the dominant discourse that AI governance only is practiced nationally and supra-nationally. Rather, the report engages with the subnational, interrogating local challenges of AI and its governance. The report conceptualizes scale as a series of transjurisdictional complexities and interdependencies involving AI governance, including the cross-border challenges posed to legal and regulatory frameworks and, more simply, the art of governing this opaque new digital technology. Thus, it is more than a legal matter. It involves managing relationships among various actors who function at different scales so that governments can ensure accountability, transparency, and effective implementation.

Findings

1. **Current research focuses on national and supranational AI governance:** *Research strengths in jurisdictions*: Research at the national and supranational levels; National and supranational concentration of power in AI and its governance; Subnational research and scalar analysis; *Research gaps in jurisdictions*: Jurisdictional flows: data centres; The digital sovereignty paradox; and Neglect of Indigenous sovereignty.
2. **Public participation in AI governance emphasizes global and national initiatives:** *Research strengths in public participation*: Global (public) participation methods; National public participation methods; Subnational public participation methods; *Research gaps in public participation*: Issues in global participation methods; Issues in national participation methods; and Less research on participation at the subnational level.
3. **Accountability in AI governance differs across scales**: *Research strengths in accountability*: Hard law: enacted and drafted AI regulation; and soft law: AIAs, standards, and public registers; *Research gaps in accountability*: Gaps in hard law; and Gaps in soft law.

Addressing research strengths and gaps clarifies requirements to meaningfully include concerns and ideas of the general public on AI, bolstering public trust as well as encouraging conversations about AI adoption and use. Standardization is useful for AI governance, at the same time paradoxically this universality across scales cannot obviate the need for bottom-up governance to address nuances, cultural contexts and the messiness of the democratic process.

1. **Digital sovereignty trends in AI governance must balance national security and economic development goals:** (1) Governments at all scales should invest in an organizational infrastructure that enables AI governance, especially for subnational governments; (2) Canadian digital sovereignty should reconsider bilateral agreements and partnerships with foreign states and international partners as part of domestic security concerns; and (3) Canadian digital sovereignty must recognize and work in parallel with Indigenous sovereignty.
2. **Meaningful public participation in AI governance is crucial for building trust across scale**: (1) Governments must centre the public's local experiences of AI; (2) Governments should slow down AI adoption; (3) Governments should improve civic engagement efforts by investing in resources to conduct public participation; and (4) Governments should support dissent in AI governance and public participation to increase public trust in AI.
3. **Accountability in AI seeks to ensure effective AI governance for the public interest:** (1) Governments should improve workers' rights and labour laws impacted by AI; (2) Governments should encourage mutual learning across governments at all scales; (3) Governments must encourage the creation of robust AI governance frameworks at all scales; and (4) Governments must invest in public interest technology.

Methodology

We conduct an integrative literature review on AI governance, with special attention to the level of jurisdiction involved, civic participation and accountability. This method is well-suited to examine emerging and multi-disciplinary fields such as AI governance, and can be fruitful in evidence-based practice concerning rapid innovations. Selection criteria included academic and grey literature on global, national, and subnational AI governance. Structured research strategies, such as specific keywords, aided data collection of academic literature. Unstructured search strategies covered the multiple disciplines and moving parts of this quickly changing field, including web search of grey literature. The literature was aggregated in an annotated bibliography. Content analysis of governmental policy documents and industry reports was conducted as it offers a flexible method to identify meanings, intentions, consequences and context across multidisciplinary, emerging fields.

Table of Contents

CHAPTER

01

Background

1. Background

1.1 The evolution and role of regulation in AI governance

The rhetoric and reality is that artificial intelligence (AI) is profoundly impacting society. Because of this, AI systems are fundamentally transforming government to government relations, the public's relationship to government, and public-private sector relations. Therefore, shaping the governance of AI is more crucial than ever. AI governance refers to structures, practices and sets of stakeholders needed to accomplish an organization's goals around AI. That being said, AI governance tends to function as top-down hierarchies, in AI development, deployment and implementation. This unidirectional scalar approach appears to be disconnected from foundational research on resources, legal authority, and civic engagement. A more comprehensive and inclusive AI governance scalar approach will be multidirectional and differ at one level of government compared to another.

One dominant aspect of scale is jurisdiction, a concept governed by law and geography. AI governance has a jurisdictional component rooted in regulation. The interesting and complicating factors of AI are transjurisdictional effects of AI because the systems are largely governed and owned by multinational companies that transcend political boundaries. Private regulation has always been a constant in AI governance despite public regulation being drafted and some finally enacted like the European Union (EU) AI Act.

Why is there so little AI regulation or, for that matter, AI governance? AI governance is seen as a "rapidly growing, yet fragmented, research area" (Birkstedt et al., 2023, p. 133) without a cohesive definition. AI governance is characterized as a translation of principles and guidelines into practice via rule-making in the AI lifecycle. More specifically, AI governance is "a system of rules, practices and processes employed to ensure an organization's use of AI technologies aligns with its strategies, objectives, and values, complete with legal requirements, ethical principles and the requirements set by stakeholders" (Birkstedt et al., 2023, p. 134). Unsurprisingly, we see considerable resistance from the private sector, wary of the rigidity of regulations (Hadfield & Clark, 2023). However, AI governance is struggling to be envisioned across society and enacted across levels of government, as towns and cities, states and provinces search for ways to determine how to quickly adapt to the changing nature of AI, its actors, and its management.

Concerns about the future of AI policy and regulation occur across the Canadian government and with the public. These concerns persist despite Canada's burgeoning AI political economy. For almost a decade, Canada has steadily invested in AI. Regulation of AI began with the federal directive, the Treasury Board of Canada Secretariat (TBS) Directive on Automated Decision-Making (Government of Canada, 2019a) and mandatory policy instruments like Canada's algorithmic impact assessment (AIA) tool (Government of Canada, 2019b). Despite this early push for regulation, the directive has yet to turn into

an Act. The result, for better or worse, was a multi-year process of debating the draft of the AI and Data Act (AIDA). AIDA was a more recent addition to *Bill C-27, An Act to enact the Consumer Privacy Protection Act*, the Personal Information and Data Protection Tribunal Act and the Artificial Intelligence and Data Act and to make consequential and related amendments to other Acts (shortened to the Digital Charter Implementation Act). Led by Innovation, Science and Economic Development Canada (ISED), AIDA would not regulate government but only regulate the private sector (Parliament of Canada, 2025). Over two years, Bill C-27 sat in Parliament, where the AIDA garnered criticism from academics, civil society and industry alike (Attard-Frost, 2023; Brandusescu & Sieber, 2025; Tessono et al., 2022). Eventually the Bill came to a halt after Parliament was prorogued.

An emerging discourse in Canada and other national governments exemplifies digital sovereignty as key to governing AI at scale. AI sovereignty draws on earlier discussions on digital sovereignty, which was linked to data governance in the 2000s and 2010s (Lauriault, 2012). National initiatives have pushed policies that support data localization and general "calls for a stronger role for the state, for strategic autonomy and digital borders in political contexts as different as China, Russia, India and the EU" (Glasze et al., 2023, p. 920). In particular, digital sovereignty has been characterized as the "globalisation of flows in the technosphere" (Glasze et al., 2023, p. 947).

Geo-political shifts, however, can lead to drastic changes and turns from concepts like AI safety toward concepts like AI security at the national level and, with digital sovereignty, a focus on building more data centres in localities. At the national level, 2025 marked the end of attempts to regulate AI towards dramatic deregulation. For example, the EU rescinded portions of its AI Act and Canada downgraded AIDA to an AI Strategy. We also see authoritarian regulation as the United States (US) Executive Order on Ensuring a National Policy Framework for AI, which explicitly blocks regulation of AI by subnational governments.

AI governance must respond to the speed and opportunity to innovate and operate AI responsibly. Considerable research is being conducted on AI governance; however, research and policy have neglected the discrepancies in how AI governance is envisioned and enacted at different geographic scales.

1.2 The role of AI governance in research and policy trajectories

As AI governance emerges and reacts to shifts in the technology, researchers have moved past singular governance models to systematic literature reviews. Early reviews embedded AI governance in broader fields like AI ethics (Hagendorff, 2019; Jobin et al., 2019) and government AI adoption (Sharma et al., 2020). These findings reveal a "global convergence" on five ethical principles: transparency, justice and fairness, non-maleficence, responsibility and privacy. In practice, however, principles diverge "in relation to...how ethical principles

are interpreted; why they are deemed important; what issue, domain or actors they pertain to; and how they should be implemented" (Jobin et al., 2019, p. 8). Hagendorff (2019) explicitly considers scale in the way AI systems become abstracted in AI governance texts, such as ethics guidelines. According to Hagendorff (2019, pp. 7-8), "ethics guidelines examined refer exclusively to the term "AI" [even though] "AI" is just a collective term for a wide range of technologies or an abstract large-scale phenomenon." The author also questions militaristic connections of AI to the arms race being at odds with achieving ethical guidelines.

In this report, we seek to understand how theoretical data and AI governance models have included or excluded jurisdiction. However, models continue to focus on one firm or level of government as guides that can be universally applied. Many AI governance models derive from consulting firms and Big Tech, which focus on organizational data infrastructure rather than geographic scale. One predominant model constructed by Janssen et al. (2020) suggests that data governance is the foundation of trustworthy AI. This layered AI governance model depicts regulations as a separate layer from culture, alongside the third layer, policies, principles and procedures. Underlying these three layers is the operational data infrastructure.

One of the first purely AI governance models created in academia was by legal scholars (Gasser & Almeida, 2017). They write about scale explicitly in relation to technological autonomy of AI systems, which "require new thinking about policy, law, and regulation" (Gasser & Almeida, 2017, p. 4). Their layers, social and legal, ethical and technical (algorithms and data), are not geographical in nature but wedged between two major components the authors call "society" and "AI systems." While not explicitly scalar, Gasser and Almeida (2017) offer the EU's General Data Protection Regulation (GDPR) as an example of a regional level unified regulation for AI. The authors prefer "a future governance model of AI [that] point[s] away from simple state-centric, command-and-control regulatory schemes toward more complex approaches...[like] advanced governance models such as active matrix theory, polycentric governance, hybrid regulation, and mesh regulation" (Gasser & Almeida, 2017, p. 4). Like above, these foundational models are organizational in nature and do not approach scale as a key measure of understanding, say, how a municipality might differ from better-resourced governments.

One important actor in state-led AI governance is civil society. Rahwan's (2018) society-in-the-loop (SITL) model is based on the concept of an algorithmic social contract between government and citizens. Through this social contract, the SITL model factors in due process and accountability (Rahwan, 2018). For Rahwan, scale explains how old institutional establishments simply do not meet the current demand of the AI era because "old mechanisms [of cooperative institutions] cannot scale adequately to larger groups" (Rahwan, 2018, p. 7). The author also depicts scale as temporal and participatory. He explains "SITL operates at different time-scales than human-in-the-loop (HITL). It looks

more like public feedback on regulations and legislations, than feedback on frequent micro-level decisions" (Rahwan, 2018, p. 12).

Conceptual AI governance has begun to incorporate AI regulation by combining several AI governance models. Particular for scale, De Almeida et al. (2021) cite the universal declaration of human rights as a framework by Donahoe and Metzger (2019), where scale is implicit as a global governance model: "This model is founded on the argument that the several different frameworks related to each specific area of ethics are insufficient to regulate AI on an international scale, both in the private sector and within the government" (De Almeida et al., 2021, p. 512). De Almeida et al. (2021, p. 522) also stated the purpose of their study was to highlight how reviewed documents "revealed significant efforts to identify and scale the risks and ethical dilemmas related to AI, as well as to seek a model for regulating AI based on different methodologies."

The AI governance framework presented by Wirtz et al. (2020) is layered but likewise independent of jurisdictional levels. The AI governance model integrates several layers: AI applications/services and technology, AI challenges, AI regulation process, public AI policy, and collaborative AI governance. The AI regulation process layer hints at the significance of jurisdictional levels. Wirtz and Müller (2019, p. 1093) do not address the detailed implications of scale but conclude that the consequence of a lack of recognition of scale creates a:

> patchwork of many small-scale solutions [that] separates the field of public AI management from one another such that the view of the bigger picture is lost and the analysis of overarching success and risk factors, the identification of interdependencies as well as the connection of related systems is impeded.

Although AI governance is studied in multiple disciplines and practices, it tends to be centred in the science, technology, engineering and mathematics (STEM) fields, where scale is not always geographic. Computer scientists view scale through the lens of increasing computational power, closely tied to private sector ideals of "scaling up" and efficiency. When researched in the social sciences and humanities, scale often relates to human interactions across levels of government, for instance in law where scale is conceptualized as jurisdictions rooted in legal frameworks, which are predominantly national. However, there is ongoing uncertainty over whether subnational jurisdictional levels possess any control over AI governance (Sieber et al., 2026). Moreover, these framings are often disconnected from the underlying dynamics of power.

AI governance could benefit from a social science, human geography perspective, which has addressed the complex relations involving scale, including the role of state power in a spatial/geographic extent. For example, data and algorithmic components can flow without friction from one country to another's localities and data centres are physical

manifestations of AI. Geography can help tackle the challenges and complexities of addressing the physicality, jurisdictionality, and transjurisdictionality.

Considerations about AI governance at scale are beginning to emerge (Ananny, 2025; Attard-Frost & Lyons, 2025; David et al., 2024). This report offers a timely and urgent literature assessment of AI governance at scale. This report, which provides a comprehensive review of research and gaps pierce the dominant discourse that AI governance is important only nationally or supra-nationally. For example, who is responsible for the impacts of a local data centre? Is a federal government accountable for AI governance or are provinces or states? Public participation in AI efforts may be governed and deployed at the national level; how are these efforts adapted at the local level? These concrete questions explicate why the geographic scale must be examined in greater detail.

CHAPTER

02

Objectives

2. Objectives

The report aims to provide a deeper understanding and envisioning of what kind of benefits effective AI governance systems could offer by examining geographic scale. The focus on geographic scale is about who decides how AI governance is envisioned and implemented and at which levels of government. Geographic scale does not refer to specific countries or cities to study. Instead, it examines how a cascading effect of AI governance from the municipal to the global unfold. What is universal and what is particular? What is the role of accountability and responsibility in AI governance and do they differ by jurisdictional level? The knowledge synthesis explores complications of AI governance as well as the impacts the different levels of governance will have on AI itself.

This report conceptualizes scale as transjurisdictional complexities and interdependencies of AI governance, including the cross-border challenges posed to legal and regulatory frameworks and, more simply, the art of governing this opaque new digital technology. Thus, it is more than a legal matter. It involves managing relationships among various actors who function at different scales so that governments can ensure accountability, transparency, and effective implementation of their objectives. This report also focuses on the importance of location, as it addresses the actual places at which AI governance is studied or managed, whether local, regional, national, or global. It importantly addresses a particular geographic gap, that of AI governance flows below the level of the nation. We now describe our methodology for conducting our analysis before reporting on our findings.

CHAPTER

03

Methods

3. Methods

We conduct an integrative literature review on AI governance, with special attention to the level of jurisdiction involved, civic participation and accountability. AI governance is a complex, interdisciplinary topic and emerging field. We use the integrative literature review method because it is well-suited to examine emerging fields, such as AI governance. The method works with "new or emerging topics that would benefit from a holistic conceptualization and synthesis of the literature to date" (Torraco, 2005, p. 357). Additionally, it has been argued that an integrative literature review "has the potential to play a greater role in evidence-based practice" (Whittemore & Knafl, 2005, p. 546), which helps create policy implications of the knowledge synthesis. We prefer this method to more established methods like Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) due to the heterogeneity and rich aspect of literature we reviewed.

Selection criteria included academic and grey literature on global, national and subnational AI governance, and made use of structured searches (specific keywords of AI governance, scale, participation, accountability). Unstructured search strategies covered multiple disciplines of a rapidly changing field, including a web search of grey literature, policy documents on standards, frameworks, and executive orders as well as databases like AI registries. Unstructured search strategies to facilitate greater critical reflection on the literature (Snyder, 2019). The literature was aggregated in an annotated bibliography. No generative AI was used in the ideation, drafting or writing of this report.

We thoroughly reviewed 150 articles on AI governance found in the academic and grey (policy) literature across jurisdictions, from supranational, national, and provincial/state, to county, city and community. We conducted analysis on governmental policy documents and industry reports across all levels of government. Content analysis offers a flexible method to identify meanings, intentions, consequences and context (Downe-Wamboldt, 1992; White & Marsh, 2006). Particularly on AI governance, Canada provides a wealth of policy documents from the TBS and ISED.

CHAPTER

04

Findings

4. Findings

AI governance is a rapidly evolving field. Our review aims to capture the state-of-the-art to address the central question on the role of geographic scale in AI governance. The review spans multiple disciplines, reflecting the inherently multidisciplinary nature of this emerging field.

4.1 Current Research Focuses on National and Supranational AI Governance

AI governance literature almost exclusively focuses on national (e.g., competitive AI arms race) or supranational (e.g., global oversight through standards) levels of scale. This is a research strength because the breadth of literature allows us to learn from these national best practices as well as policy failures. The focus also highlights a research gap, particularly the limited attention to subnational levels, where AI governance solutions are implemented, and where AI impacts subnational governments even as it operates across and beyond jurisdictional boundaries. We discuss these research strengths and gaps below.

4.1.1 Research strengths in jurisdictions

4.1.1.1 Research at the national and supranational levels

As above, much coverage of scale is national and global in nature. The early national focus of AI governance (Hagendorff, 2019; Jobin et al., 2019) and"global-scale analysis" identified by Corrêa et al. (2023) implied the appropriate way to examine AI governance. AI governance review papers also compare how AI ethics is represented across Global North and South countries. Corrêa et al. (2023) do question, however, whether a global consensus is possible. Their review uncovers a skewed preference for AI governance from Global North, with the majority of policies and guidelines originating from Global North countries, approximately one third of which originate from the US. This occurs in spite of the existence of guidelines and policies in AI from the Global South, including China, India, and Brazil (Corrêa et al., 2023).

Many exploratory studies and systematic reviews adopt a country-focused approach (Attard-Frost & Lyons, 2025; Attard-Frost et al., 2024; Brandusescu, 2021). For example, empirical research on AI governance has examined public investments in AI and AI policies in Canada (Brandusescu, 2021). That research examines the role of funding at the national level as well as the effects of public, private and public-private partnerships on subnational levels. It analyzes funding flows from the national and international levels to subnational levels, specifically the province of Quebec and City of Montreal. The findings highlight implications related to hiring firms outside of Canada, including the role of AI companies with links to human rights abuses (Brandusescu, 2021). Geographic considerations emerge

through these examples, as well as through the concentration of power in AI research centres located in major Canadian cities and focused on research and development (R&D) (Brandusescu, 2021).

Authors begin to unpack the details of AI governance through categorization, some of which are explicitly scalar like national-level governance and international-level governance (Batool et al., 2025). Much of AI governance in practice takes the form of committees. These include AI ethics committees within federal governments, global governance coordinating committees, multi-disciplinary steering committees along with project-specific sub-committees, public managers, as well as the World Health Organization and International Telecommunication Union state members. These committees are composed of stakeholders from national and international levels as well as organizational levels. Even though AI ethics is lauded as a big part of AI governance, Batool et al. (2025, p. 3274) find a "perceived lack of attention given to ethical and responsible AI principles in existing governance efforts. Many existing governance frameworks prioritize compliance and risk management, often focusing on technical and operational aspects such as performance, accuracy, and scalability." Scalability here refers to increasing production capacity rather than geographical scale.

4.1.1.2 National and supranational concentration of power in AI and its governance

Echoing Corrêa et al. (2023), we find an uneven geographic distribution of AI governance across countries. Important to a geographic view of scale is Sharma et al.'s (2020) systematic review, which depict differences in AI adoption between Global North and Global South countries, as well as high-income and low-to-middle-income countries (Sharma et al., 2020), suggesting AI adoption serves as a predicate for AI governance. Sharma et al. (2020) see a research gap to be filled in AI governance that more fully incorporates and prioritizes public administration.

Even as scale in AI is analyzed through country-to-country relations (e.g., Global North-Global South), these relations are influenced by multinationals whose control often emanate from a dominant country (Birhane, 2020; Miceli et al., 2022; Posada, 2020). Birhane finds that "much of Africa's digital infrastructure and ecosystem is controlled and managed by Western monopoly powers such as Facebook, Google, Uber, and Netflix" (Birhane, 2020, p. 393). Birhane (2020, p. 396) also argues that "importing of AI tools made in the West by Western technologists may not only be irrelevant and harmful due to lack of transferability from one context to another but also is an obstacle that hinders the development of local products." Focusing on the specifics of local contexts, particularly in non-Western settings, sheds light on tech power asymmetries and the role of subnational governance.

4.1.1.3 Subnational research and scalar analysis

Some research is conducted on subnational AI governance. A systematic review examines federal and provincial AI governance initiatives in Canada, contributing "a novel macro-scale synthesis of AI governance initiatives" (Attard-Frost et al., 2024, p. 1). Initiatives including strategic plans such as AI R&D programmes are reviewed. Attard-Frost et al. (2024)'s research points out the lack of evaluations of the outcome of these government-led AI governance initiatives, as well as elements of public trust and participation in AI governance.

Jobin et al. (2021, p. 2) admit that studies of the subnational scale "have been mostly overlooked by research on AI governance." Veale and Borgesius (2021) concur that this emphasis on international and federal-level instruments has left local-level governance understudied. Authors have argued that the examination of policy and policymaking in subnational levels is foundational for a comprehensive development of AI governance (Sieber et al., 2026). Sassen (2005, p. 156) contends that "practices and institutions that scale at sub-national levels [require examination with] methodologies and theorisations that engage not only with global scaling but also sub-national rescaling as components of global processes." McKelvey et al. (2023) argue that AI governance shows the flow from local to global. For instance, they note "how parallel provincial and federal AI strategies have synergized to turn Montréal into an AI hub", which warrants greater examination (McKelvey et al., 2023, p. 8). Research acknowledging the subnational AI governance gap is slowly starting to exist.

Where local governments are covered, they are country-specific. Yigitcanlar et al. (2023) examine AI perceptions in Australian local councils to understand levels of preparedness of AI adoption and knowledge, where scale was relegated to readiness, nonreadiness, and focus. A reported lack of broad-based proficiency was required in local councils for more AI adoption (Yigitcanlar et al., 2023, p. 1145).

Jobin et al. (2021, p. 5) investigate AI policy in subnational governments across Germany and connect it to federal government policies. They reinforced the significance of interconnecting features "between federalist structures and the shaping of digital policies stems from the shared competences between the federal and states' level [and the way] states execute the laws made at the federal level". Their study demonstrates that "AI governance research benefits from including the perspective of AI federalism [where] a more thorough analysis of the relation between national and subnational policy initiatives" is needed (Jobin et al., 2021, p. 10). This is one of the few studies examining the role of federalism, which is important for Canada's confederated structure.

In interviews with civil servants in Germany, Schaefer et al. (2021) apply the TOE (Technical, Organizational, Environment) framework to AI adoption in municipalities. Besides perceived financial cost and strategic alignment in cities, industry, internal government and society pressures of AI adoption prove to be significant for understanding AI governance in cities (Schaefer et al., 2021). Mikalef et al. (2019) conduct empirical

research to understand the challenges and opportunities of AI development and deployment in municipalities across Norway. Authors argue for the importance of "understand[ing] in which areas AI will be central in order to propose optimal methods for deploying such solutions and streaming adoption processes" (Mikalef et al., 2019, p. 275). Commonalities are emerging around proposed foundations of organizational and technical structures for AI governance.

An empirical study was conducted across municipalities in Canada on the benefits and challenges in the decisions of municipalities to either create their AI systems in house or to outsource that development to external actors (Wan & Sieber, 2025). One benefit of outsourcing is that it offers "local governments the opportunity to leverage external expertise and financial resources (e.g., from university grants), enabling them to navigate the complexity of AI" (Wan & Sieber, 2025, p. 86). At the same time, Wan and Sieber (2025, p. 86) note that

> a local government should resist the temptation to deploy AI without any in-house capacity. Contrary to traditional IT systems, which can be complicated due to the sheer volume of code, AI systems present a unique form of complexity resulting from their emergent and opaque nature.

A survey of municipalities in Canada found that "nearly a third of survey respondents said their municipality has no formal policies or guidelines in place for AI or generative AI. Without these structures, governments risk inconsistent or unsafe use of new technologies" (MNP Municipal Report, 2025). Canadian municipalities are rapidly adopting AI systems in the absence of AI governance frameworks. Canadian municipalities find it challenging to create governance from the bottom up, while developing AI in real time as found in projects presented at the AI in Canadian Municipalities Community of Practice (AI COP) (Sieber et al., 2026). These projects included AI and digital policy drafts, AI and civic participation, AI and procurement, and public investment in AI. Federal and provincial policies are perceived as having limited impact on Canadian municipalities. Moreover, local AI governance relies on outsourcing of AI systems, highlighting a deeper problem in dependency across scales with private actors able to marshall resources that exceed those of a municipality.

An explicit, multi-geographic scale analysis of AI governance in Canada, uses service system analysis methods and thematic analysis. The framework "conceptualiz[es] and analyz[es] AI governance [activities], including international, national, subnational, sectoral, and organizational systems of governance" (Attard-Frost & Lyons, 2025, p. 2557). The various layers, sub-national and international, however, are all linked to a central national layer. As such, the AI governance framework showcases "key ecosystem-level entities and relations that participants perceived as significant to Canada's national AI governance" (Attard-Frost and Lyons, 2025, p. 2569).

Research strengths in scalar levels reveal the considerable research and practice accomplished at national and supranational levels. Simultaneously, we see how geographic scale complicates the diffusion of these activities across multiple contexts when multiple jurisdictional layers and actors are involved. This warrants the need to discuss the persistence of research gaps.

4.1.2 Research gaps in jurisdictions

The geographic literature on scale helps us address the flows across jurisdictions to reconcile how AI governance models that are bounded as strictly national or international hinder our understanding of flows and interactions grounded in a political economy of AI.

The use of facial recognition technology (FRT) is a clear example of how official state borders do not matter. This transjurisdictionality of AI also may explain the focus on national and international levels as ways to contain and control AI. FRT evades accountability even with hard law (regulations) in place. For example, numerous lawsuits from various national governments across the world (EU European Data Protection Board, 2022; Public Safety Canada, 2020) have been launched at best-known multi-national FRT company Clearview AI. Loopholes in procurement, such as Clearview AI's practice of offering free software trials to departments and agencies can be described as an instance of collapsing scale. In other words, AI cannot be contained and controlled purely based on jurisdictions. Authors point out "value chains that link the supply and implementation of AI technologies, and the infrastructures on which they rely, [which] have transboundary elements" (Veale et al. 2023, p. 265) and contribute to jurisdictional flows.

4.1.2.1 Jurisdictional flows: data centres

Geographers allow us to see the flow between jurisdictions and not just the jurisdictions themselves, for instance the "economic decisions...at a variety of scales, from the local to the regional, national, and the global" (Álvarez León, 2021, p. 230). Walker and Winders (2021, p. 163) view "advances in AI [as] fundamentally alter[ing] a range of industries and economic activities, while also ushering in a period of rapid innovation across scales." They highlight the significance of interdisciplinary research to examine AI "as an object of analysis in the context of the economy or work, intimate care, political geography, or science fiction and social theory... [for] key arguments about how to engage those entry points across and through scales" (Walker & Winders, 2021, p. 164). The 'where' in AI is viewed through a political economy lens, where researchers "rework, compress, and sometimes pull apart the scalar politics of the capitalist economy, geopolitics, care, the body, and sites of automation" (Walker & Winders, 2021, p. 164). Here geographers inject into governance political pressures, whether from the private or public sectors, and not simply economy.

Rosen and Álvarez León (2022) introduce the "digital growth machine" to explain the deep impact, even in the Global North, that distant firms can exert on urban,

subnational governance. The digital growth machine is characterized as a distant concentrated data and AI-driven system designed to continuously acquire, engage, and retain users as part of the innovation economy. “At the urban scale, the city becomes a digitized landscape thoroughly re-created as a site for [distant] capital accumulation [where AI and associated systems] transform urban space itself” (Rosen & Álvarez León, 2022, p. 2259).

Data centres manifest this transformation because they demonstrate both geographic physicality (specificity) and transjurisdictionality. Economic decisions about data centres are increasingly tied to creative financialization of, for instance, secretive leaseholds, tax incentives, guarantees of residual values to data centre bond holders, unbundling computers from real estate, and unbundling GPUs from computers (Karma, 2025). Edwards et al. (2025, p. 435) find that “many of the largest data centers in the world are colocation data centers managed by less immediately visible companies.” Financial consequences of these investments for governments and the public remain unclear, especially absent regulation for data centres. What exists are industrial policy frameworks that influence decisions and shape tax incentives and leaseholds support Big Tech’s efforts for construction and maintenance, which transcends jurisdictions.

Scholars argue that “the ‘where’ of the data center matters [as they] rely on the environmental conditions in which they are located to cool servers [and are] deeply enmeshed with local politics, utility providers, and existing infrastructure” (Edwards et al., 2025, p. 437). The locality and its residents bear the burden of air, water, and noise pollution and habitat loss. Hogan argues that “data, at such a large scale, should also be understood as a symptom of impending global environmental catastrophe because it is at the center of a profit model that requires the exploitation of humans, animals, water, and land” (Hogan, 2021, p. 289). The physicality of the impacts of data centres remove the abstraction of AI governance.

4.1.2.2 The digital sovereignty paradox

From 2024 to the present day, there has been a shift in AI governance discourses from AI safety towards AI security towards digital sovereignty. One prominent discourse of digital sovereignty is “the idea that a nation or region should be able to take autonomous actions and decisions regarding its digital infrastructures and technology deployment” (Pohle & Thiel, 2020, p. 8). However, digital sovereignty exemplifies how containment in a single country is a fiction. This “strategic autonomy” comes at a cost since investments demanded “for strong independence [like] semiconductors, cloud, networks, AI, green industry, medicines...far surpass the resources of most countries” (Timmers, 2023, p. 580). Three geopolitical superpowers, the US, China and the EU dominate in AI, breaking the ability for countries to be truly sovereign (Brookings Institution, 2025; Pohle et al., 2024; Timmers, 2023).

The evolution of digital sovereignty in the AI arms race and AI governance discourse resembles nationalism and in practice manifests as simultaneous deregulation and authoritarian regulation. We see these reflected in the European Commission rescinding parts of the EU AI Act and Canada downgrading AIDA efforts to a National AI Strategy, and the US Executive Order on Ensuring a National Policy Framework for AI blocking decisions by subnational governments. AI sovereignty becomes inextricable from enhancing national security and its military or a country's role in the global economy. Mügge (2024, p. 2207) is more direct: "The consequence is a putative 'AI race', in which a few leading jurisdictions vie for economic supremacy and their relative independence, because prosperity that hinges on foreign companies constitutes a vulnerability". As such, we have seen national and regional economic defense moves.

Regardless of attempts, for instance in Europe to introduce an AI "EuroStack" (Bria, 2025), the focus of digital sovereignty remains tech companies influencing nation states, where "digital sovereignty programs of Amazon, Microsoft, and Google reveal a broader [co-optation by] platform companies [that robustly] engage with policy, political and academic concepts" (Grohmann & Costa Barbosa, 2025, p. 419). Authors, however, do give a nod to the importance of heterogeneity in regional contexts when discussing digital sovereignty, where what it "signifies in a European policy framework may differ substantially from how it is invoked in Latin America, Africa, or Asia" (Grohmann & Costa Barbosa, 2025, p. 419). Even when AI governance solutions like digital sovereignty move down jurisdictional scales, there is no one size fits all solution. Defying universal models, local and regional contexts still matter.

4.1.2.3 Neglect of Indigenous sovereignty

The findings also showcase a neglect of incorporating Indigenous perspectives in AI policies, whether from government, industry or academia (Assembly of First Nations, 2023; Tu, 2025). The Assembly of First Nations (2023, p. 8) policy brief submitted to Bill C-27 explains this fundamental misstep by the Canadian government:

> Canada has committed morally and legally to seek consultation and cooperation with First Nations to obtain First Nations' free, prior, and informed consent to adopt or implement legislation or administrative measures that impact First Nations' rights. There has been no such consultation, there has been no opportunity for cooperation, and First Nations do not have the capacity or inclination to extend their free, prior, and informed consent to this legislation.

Indeed, "the consequences of AI technologies are deeply felt by Indigenous communities, from surveillance and biometric data collection to health-care algorithms and digital language tools" (Tu, 2025). In an empirical research, Couture et al. (2025) critiqued digital sovereignty efforts by focusing on two different groups impacted by the concept:

civil society organizations and Indigenous organizations. The manner in which these two groups resist top-down calls for digital sovereignty is critical. Authors call on us to "unthink" digital sovereignty and centre factors, such as autonomy and self-determination, which move "beyond state-centric models." It also is important to focus on workable values, rather than generic value systems, such as Canadian values, which often are repeated across AI governance solutions. Unthinking digital sovereignty also requires examining its cultural dimensions as well as forced values such as openness, "which emerges as a point of tension between [Indigenous and Canadian] perspectives" (Couture et al., 2025). Much of this speaks to the need to build public trust as well as Indigenous trust in opening public participation to a broad range of Indigenous Peoples and members of civil society.

4.2. Public Participation in AI Governance Emphasizes Global and National Initiatives

The literature on AI governance, where it concerns meaningful public participation and civic engagement, is not confined to a single academic discipline but spans disciplines and practices. Legal scholars conceptualize engagement as human rights or concerns about privacy (Smuha, 2021), which exist largely at the international level and separated from 'on-the-ground' realities. Computer scientists view scale through the lens of increasing computational power, closely tied to private sector ideas of "scaling up", for example by achieving efficiencies in participation (Arana-Catania et al., 2021). Philosophers approach scale by considering the implications of actions and policies at different jurisdictional levels (Floridi, 2021) but examine the impacts of and not public engagement in AI. Not only is civic engagement considered essential to good AI governance; civic engagement in AI is interesting since so many disciplines (computer science, public policy, law, communications) and sectors (public, private) claim they have perfected public consultation regarding AI.

4.2.1 Research strengths in public participation

Across disciplines and within AI governance discourses, public engagement has been linked to public trust in AI (Government of Canada, 2026a). The rationale is that if government engages more people around AI issues, including demonstrating its benefits, then the more the public will trust AI. Watkins et al. (2021, p. 1013) assert that public participation is necessary to gain feedback from the "broadest possible set of stakeholders in a system. Such participation is a resource to expand the list of impacts assessed or to shape the design of a system." Much of public engagement in AI also is combined with calls specific for public interest AI (Current AI, 2026; Humboldt Institute for Internet and Society, 2026). Using public interest theory, Humboldt Institute for Internet and Society (2026) defines Public Interest AI systems that are not necessarily processual focused but "serve people and equity in societies instead of private goals and profit maximisation" (Humboldt Institute for

Internet and Society, 2026). The rise of generative AI, in particular, has increased efforts to both theorize and create tools to do AI-related participation at various scales.

4.2.1.1 Global (public) participation methods

Researchers have developed multiple methods to increase engagement in AI governance. Multistakeholder fora is a popular model, both for global and national initiatives (Sieber et al., 2024; 2025). At the international level, these tend to be hosted by intergovernmental organizations like the Organisation for Economic Co-operation and Development (OECD) or UNESCO as well as in high-level nonprofit spaces like World Economic Forum, which gather diverse representatives from multiple sectors and disciplines to broadly consider the impacts of AI. It should be noted that many forms of global participation are not exclusively public, but reserved for those with domain expertise. In other cases, stakeholders may represent an entire group, such as civil society.

A form of public-specific participation gaining traction in AI governance is the citizen assembly. Citizen assemblies are primarily conducted at national levels, although efforts have been made to scale citizen assemblies to global level, to achieve public participation 'at scale'. Davies (2024) makes the case for a global citizens assembly: "inviting individuals from across the globe to join in processes where they have access to expert insights, opportunities to learn, and facilitated space to deliberate together, bringing diverse perspectives and experiences to bear on questions of global importance." As part of the Connected by Data UK nonprofit, Davies et al. (2024) report on the global citizen deliberation on AI and find that, despite the enormous financial investments in AI, a lack of commensurate financial support is provided to citizen participation methods (Davies et al., 2024, p. 37). Discussions around the funding chasm between AI development and participation are ongoing, suggesting that funding trajectories can change course (Current AI, 2026).

The challenge for global dialogues on AI is meaningful engagement and a genuine role in shaping AI systems and their governance (Davies & Colom, 2025). In 2025, the first edition of the Participatory AI Research & Practice Symposium (PAIRS) was held in Paris, France as part of the week that shaped the heads-of-state-led AI Action Summit. Created by international researchers from multiple disciplines, from computer science to humanities and social sciences, PAIRS offers a "space to present research and case studies on the state of the art in participatory development and governance of AI, and to build stronger connections across the field" (PAIRS, 2026). This venue has made room for exploratory and empirical research to understand what constitutes meaningful engagement and to see how it can effectively work across jurisdictional scales in both the Global South and North.

McKinney and Chwalisz (2025) create a theoretical framework for scale in AI participation within a deliberative democracy. Theirs has five dimensions: "scaling out (increasing deliberator numbers), scaling up (higher governance levels), scaling across (increasing number of processes), scaling deep (increasing impact), and scaling in

(improving deliberative quality). All dimensions are aided by a participatory AI system, such as DemocracyNext's Assembly Assistant that automates their citizen assembly guide with "the aim of serving the higher order goal of enabling assemblies to scale across more quickly and easily" (McKinney & Chwalisz, 2025). Their model suggests that doing participation at scale, especially globally, may necessitate automation.

4.2.1.2 National public participation methods

Polls and surveys offer an older but durable form of participation to capture public sentiment about AI. In the US, authors have conducted empirical research on public perceptions of AI governance with a particular focus on trust and ethics (David et al., 2024). Of note, in Canada, these methods have revealed a high level of public distrust in AI (Edelman Trust Barometer, 2024). This explains why the federal government has been highly invested in trust as a way to improve social acceptance of AI.

National public consultations offer another form of public engagement in AI governance. In Canada, with the new federal government in place and prime minister, ISED created the AI Strategy Taskforce in 2025 composed of experts from academia and industry. In October 2025, ISED launched a 30-day sprint consultation on the future of Canada's National AI Strategy via the AI Strategy Taskforce. From October 1 to 31, 2025, ISED asked members of the public and private sector to answer a series of questions to participate in shaping that AI strategy. ISED's overarching findings on the 30-day AI sprint showcased the need for: "ethical, safety-focused research tied to democratic values; transparent governance and risk-based regulation; sovereign infrastructure and intellectual property protection; national AI literacy and lifelong learning; and strong security frameworks and liability laws" (Government of Canada, 2026a). The results from the public consultation devised by ISED reflects an alignment with the goals of the federal government.

Moving from the Global North to South, Savaget et al. (2019) examine the case of Brazil's 'Operação Serenata de Amor'(OSA), which deploys AI for civic auditing of public administration. OSA showcases what political participation through AI looks like in practice. Scale here is used as a 'follow the money' mechanism, by scaling up the team of public servants in applying technology to investigate expenses by various parts of the Brazilian government (Savaget et al., 2019). This example begins to more explicitly tie consultation to political participation.

Similar to stakeholder engagement, citizen assemblies and citizen juries have been advocated for participation in AI (Ada Lovelace Institute, 2021; Data Justice Lab, 2021; McQuillan, 2022). Citizen assemblies have been described as a method to promote inclusive governance (Centre for Media, Technology and Democracy, 2025). More specifically, deliberative democracy approaches are combined with participatory democracy approaches as a way of "empowering the public to play the definitive role...By ensuring that AI governance reflects diverse perspectives and democratic values, we can

build a future where technology strengthens our democratic institutions and serves the public good" (Lam & Solomun, 2025, p. 2).

In recent years, citizen assemblies have gained popularity in Canada. A national youth forum on AI brought together 100 Canadian youth to shape AI governance by partaking in themed discussions in Toronto (AI and chatbots), Montreal (AI and information integrity), Vancouver (AI and data privacy), and Halifax (AI and age assurance) (Centre for Media, Technology and Democracy, 2025). Youth raised concerns regarding AI and recommended policy interventions for improving AI systems.

4.2.1.3 Subnational public participation methods

Public consultations also offer a popular form of participation in subnational governments. In 2023, the *Conseil de l'innovation du Québec* collected over 420 contributions in response to a public questionnaire and organized a public forum that brought together nearly 1,500 people to discuss and define the challenges and opportunities presented by AI (*Conseil de l'innovation du Québec*, 2024). The result was a report with policy recommendations for ensuring the responsible development and use of this technology. The *Conseil de l'innovation du Québec* (2024) combined these results with an expert consultation, where they gathered approximately 250 experts to gain further insights and recommendations on the development of AI.

Several authors address tensions in the choice to scale up or to remain local (Moats & Ganguly, 2025; Seaver, 2021; Young et al., 2024). Young et al. (2024) examine a common method in commercial AI labs called participatory design. They find scaling up is not irreconcilable with community-based participation but one needs to address issues that "differ along the fault lines of centralized to distributed [AI] development; calculable to self-identified publics; and instrumental to intrinsic perceptions of the value of public input" (Young et al., 2024, p. 1). They identify how participation can build a public interest infrastructure for scalar action by examining subnational civic projects in the US (Young et al., 2024). Seaver (2021) also recognizes a tension in choosing scale over "the small concerns in" care (Moats & Ganguly, 2025). Moats and Ganguly (2025, p. 4) argue that "there are both callous ways of interacting at the local level and empathic ways of working algorithmically with a large population." As such, there does not necessarily need to be an antipathy towards scale but preserving attention to the local and small.

Research strengths in participation reveal the ways authors have examined public engagement and civic participation in AI, especially as AI adoption and deployment rapidly proliferates with little civic input. There is more to be understood to achieve meaningful participation at multiple scales. The next section discusses these challenges.

4.2.2 Research gaps in public participation

Arguably, public participation is rooted in localities and not across scales, as cities are often considered "laboratories of democracy" (Barnett & Bridge, 2013; Low, 2009). Citizen

engagement around AI usage responds to the politics of a particular place. If scale represents a "sociotechnical achievement of asserting a sameness or isometry across contexts where otherwise diverse forms of life, interests, and values are already in place" (Young et al., 2024, p. 4), then doing participation at scale or conducting forms of participation like public consultation or polls resembles the shallow desire for consensus and homogenization.

4.2.2.1 Issues in global participation methods

Above, we discussed the broad utility of multistakeholder governance forums; however, these fora reveal numerous unresolved challenges that limit citizen influence (Sambuli, 2021). Most notably, the fora tend to overrepresent Western nations in AI governance initiatives and absent non-Western players from the table, including China, an AI powerhouse. The geopolitical unevenness also is explicated through the resource-intensive process of participation, which benefits stakeholders like industry and government. (Sambuli finds the same resource unevenness in the Global North.) In relation to scale, Sambuli (2021) observes a lack of clarity in the relationship of multistakeholderism to multilateralism, which is an older form of diplomatic, bilateral and global governance.

Issues with large-scale, high-level stakeholder engagement (e.g., UN Independent International Scientific Panel on AI) exist elsewhere. Petit and Oleart (2026, p. 1) describe the deliberative mini-publics on AI that were created in the EU. These mini-publics were "presented as giving voice to "everyday citizens" and improving democratic legitimacy in policymaking, in practice...served to build support for current policy that replicates the interests of big tech" (Petit & Oleart, 2026, p. 1). Authors call this a form of "citizenwashing", where the EU aligns its participation method to match those of private, economic, and political interests. Through this exercise, participation creates a false sense of public engagement (Petit & Oleart, 2026). All too easily, participation can be co-opted at the global level.

4.2.2.2 Issues in national participation methods

In Canada, the attempt at regulating AI for the private sector with AIDA failed in any public consultation (Attard-Frost, 2023; Brandusescu & Sieber, 2025a; Tessono et al., 2022). This deficiency exists across scales. A prominent critique centred on the government's reliance that eventually the public would trust AI even without offering a mechanism for public feedback. Even with ISED's 30-day AI sprint, a gap persists in doing meaningful participation at national or subnational scales. The federal government's AI sprint report did not categorize civil society or nonprofit communities as a separate identifiable voice. We can speculate that these organizations were filed under "Arts, entertainment and recreation", "Information and cultural industries" or "Academia" (Government of Canada, 2026a). Consequently neither governments nor the public possess a finer resolution view of desired forms of participation not just from civil society organizations but also grassroots

organizations, local communities and Indigenous organizations. It also is notable that representation across territories is sparse. Even participants residing in Quebec, one of the largest AI powerhouses in Canada, hardly participated.

Overall synthesis of the 30-day AI sprint respondents concluded there was mixed optimism and skepticism to AI's potential. According to ISED, "Supporters see opportunities for productivity gains and economic growth, while critics warn of ethical, environmental and social harms [notably] loss of IP and foreign dominance; lack of regulation and accountability; and environmental degradation and job displacement" (Government of Canada, 2026a). Moreover, the decision by ISED to automatically summarize the over 3000 responses to the survey with (not one but five different) generative AI models (Lunau, 2026) is worrying.

To address gaps in what constitutes meaningful participation in AI at different scales, Sieber et al. (2025) developed a new understanding of models of civic engagement in government decision-making processes that are being automated with AI. They found five different ways engagement was considered in the literature: participation as a natural byproduct of automating government, participation facilitated through the medium of AI, participation in AI as quantification, participation as a technocracy of trust, and participation as meaningful. These participatory methods depend entirely on the level of government. Internationally, polls assess trust in AI (and trust then becomes associated with social acceptance and engagement); nationally citizen assemblies and juries appear. At the local level, participation is often seen as a byproduct of improved service delivery (Sieber et al., 2025). Because participation is messy and contextual, the question remains which is the most meaningful method for AI.

Relatedly, the private sector, specifically commercial actors "might emphasize engagement's congruence with values related to administrative efficiency, improved service delivery, or the creation of economic value, for example by suggesting that public consultations can help to solve problems of interoperability and scaled data transfer" (Wilson, 2022, p. 4). This type of research tends to emphasize engagement between industry and various federal governments.

4.2.2.3 Less research on participation at the subnational level

Realizing the subnational level research gap, in *Artificial intelligence in the city: Building civic engagement and public trust,* Brandusescu and Reia (2022) captured notions of meaningful engagement and public participation at the local level, addressing inequalities and building trust, public and private boundaries in tech policy, and new directions for local and urban governance. Challenges to more inclusion in participation by local governments still persists. In their study on *Building AI governance in municipalities from the ground up,* Sieber et al. (2026, p. 2) found that "local AI governance [in Canada] lacks civic participation."

Even though participation is often small and local, occurring where government is closest to the public, researchers can seek universal local methods for AI-related participation (Davies et al., 2024; Marcucci et al., 2020; Sieber et al., 2025; Young et al., 2024). Relatedly, "participatory governance and design methods converge around a commitment to locality; simply put, people are not the same everywhere" (Young et al., 2024, p. 4). And yet, there is a desire to scale AI participation, in this case, from community to community, without deep appreciation of context.

It is notable that there is pushback to a scalar approach that removes AI engagement from the purely local. Hanna and Park (2020, p. 1) assert that

> technological solutions grounded in scale thinking are unlikely to be as liberatory or effective at deep, systemic change as their purveyors imagine. Rather, solutions which resist scale thinking are necessary to undo the social structures which lie at the heart of social inequality. We draw on recent work on mutual aid networks and propose questions to ask of collaborative work systems as a means to evaluate technological solutions and guide designers in identifying sites of resistance to scale thinking.

4.3 Accountability in AI Governance Differs Across Scales

Amidst discussions of the AI arms race, AI security, and digital sovereignty, it is hard to overstate how important accountability is to the discourse of AI governance. Accountability has been called a cornerstone of AI governance "because of the delegation of tasks (e.g., prediction or decision-making) to AI systems" (Novelli et al., 2024, p. 1871). Accountability in AI literature (Watkins et al., 2021; Wieringa, 2020) relies on the public administration literature on public sector accountability. Bovens (2007, p. 447) argues that accountability is "a relationship between an actor and a forum, in which the actor has an obligation to explain and to justify [their] conduct, the forum can pose questions and pass judgement, and the actor may face consequences." This last clause from Bovens (2007) resonates more with hard law (e.g., regulations) than soft law (e.g., norms, standards); that clause often is eliminated from AI governance literature as the focus is often on soft law. This is echoed in what Lechterman (2022) describes as the "AI accountability gap", where he reviews definitions of accountability and asserts that "accountability's primary job description is to verify compliance with substantive normative principles" (Lechterman, 2022, p. 164), instead of assessing AI systems to ensure compliance with government policies and diminish harms and risks. In the next section, we highlight the strengths and then the gaps of how accountability in AI governance unfolds across type (e.g., hard law, soft law) and scale.

4.3.1 Research strengths in accountability

Accountability is generally implemented as hard law or soft law. Soft law is most prominent as a form of accountability in AI governance and is seen in various voluntary policy practices. Similar to public participation, accountability manifests differently by scale.

4.3.1.1 Hard law: enacted and drafted AI regulation at multiple scales

Hard law is seen at jurisdictional levels that have the power and resources to enact it. The first robust example of hard law is the EU AI Act, which assigns risk categories to AI systems. For accountability purposes, "high-risk applications, such as a CV-scanning tool that ranks job applicants, are subject to specific legal requirements" (EU AI Act, 2026). At the same time, "applications not explicitly banned or listed as high-risk are largely left unregulated" (EU AI Act, 2026). Novelli et al. (2024, p. 1877) reviewed the goals of accountability by analyzing the EU AI Act. They present four goals of accountability, namely compliance, report, oversight and enforcement, which they divided into two groups: proactive accountability (as virtue) through compliance and oversight and reactive accountability (as negative) through report and enforcement. It is noteworthy that the EU AI Act has paused some of its implementation, notably those in favour of industry innovation, which we discuss in the next subsection on research gaps.

Besides the EU, AI regulation has been enacted at the country level as hard law in South Korea, Japan, China, and more recently, the US. In January 2025, South Korea enacted its AI Framework Act focused on AI adoption as well as transparency and safety requirements for AI systems. In May 2025, Japan enacted its AI Promotion Act with a similar focus on transparency and safety measures. Both countries included human rights principles in their regulation (Artificial Intelligence Act, 2026). For Japan, the government decided "to publicly disclose the names of companies that use AI to violate human rights" (Simpson, 2026). Although there is no one explicit AI law that governs AI in China, the country enacted the stature of "Measures for Labeling AI-Generated and Synthesized Content" that specifically targets AI systems and their implementation. China also enacted four different types of cybersecurity laws that explicitly govern generative AI (CMS Legal, 2026). China has a robust approach to AI ethics in its AI governance practices. Their commitment is enacted through the comprehensive "Trial Measures for Ethical Review and Service of Artificial Intelligence Technology" policy issued by the Ministry of Industry and Information Technology and eight other departments (Government of China, 2026). In December 2025, the US published an executive order to signal the creation of a new national AI policy (US Government, 2025). For instance, "Enabling Innovation and Ensuring American AI Dominance" includes the call that "Congress should provide resources to make federal datasets accessible to industry and academia in AI-ready formats for use in training AI models and systems" (US Government 2025).

Other countries are drafting AI regulation, including Brazil, Argentina, India, and Vietnam. Australia and the UK have drafted data protection laws that will implicitly impact the development and deployment of AI systems. Canada no longer has AIDA and will likely rely on the amendments to their Privacy Act (governing the public sector) and the Personal Information Protection and Electronic Documents Act (PIPEDA) (governing the private sector).

At the subnational level, Canada has implemented several regulations that impact AI. In 2024, the Ontario Government has enacted "Bill 194, Strengthening Cyber Security and Building Trust in the Public Sector Act", where "in the public sector [AI] should be used in a responsible, transparent, accountable and secure manner that benefits the people of Ontario while protecting privacy" (Ontario Government, 2024). In 2025, "Bill 61, Ontario Artificial Intelligence, Talent and Innovation Strategy Act, 2025" seeks to create, operationalize and maintain an AI, talent and innovation strategy through an AI Advisory Committee to make recommendations and publish annual reports on evolution of the strategy led by The Minister of Economic Development, Job Creation and Trade (Ontario Government, 2025). Similarly to the federal government, provincial governments rely on privacy protection as a rationale for creating AI regulation.

At the municipal level, a notable regulation is the "BTS-4.04 - Artificial Intelligence Use and Governance" enacted by the City of Portland, which details the requirements needed for acquiring, developing, and deploying AI systems and services. Two key objectives of the regulation include

> clear, practical guidance which supports decision-making for City-authorized users who may be purchasing, configuring, developing, operating, using, or maintaining the City's AI systems or who use AI systems to provide services to the City [and] define roles and responsibilities related to the oversight and responsible use of City AI systems (City of Portland, 2026).

Overall, AI governance includes no one uniform type of accountability via hard law, likely reflecting scale and cultural context.

4.3.1.2 Soft law: AIAs, standards, and public registers

Accountability via soft law seems to be the preference in government. Similar to hard law, these measures increasingly are promoted irrespective of jurisdictional level. The most predominant types are algorithmic impact assessments (AIAs), technical standards, and public registers.

One of the earliest and most popular soft law accountability measures for AI is the AIA. AIAs offer a policy tool to govern the design and development of AI (Selbst, 2021). Deemed a best practice for AI governance, AIAs are inordinately implemented by governments at the national level, although they are beginning to be developed at

subnational levels, which highlights an instance where instruments flow across scales. A typical AIA is a series of questions on AI system performance and data quality producing a points-based reward system for impact and risk assessment levels. Moss et al. (2021) argue that AIAs are popular because they organize interactions among institutions and external stakeholders (e.g., industry, the public). Publicly available AIAs can act as a mediator of experts and the public but "do not [seek to] reflect a common understanding or consensus across these groups" (Mulligan & Bamberger, 2019, p. 843).

Two examples of Canadian government-led AIAs can be found at the national and subnational levels. Canada's AIA developed by the TBS has become a gold standard for other countries. Besides being the first government to develop an AIA, the AIA has an open license and is available on GitHub, which makes it both transparent and customizable (Darbyshire, 2022) for other countries and potentially other scales. Canada's AIA is a mandatory policy instrument, a compliance tool for risk assessment that supports TBS's Directive on Automated Decision-Making (Government of Canada, 2019a), where the "scores are based on many factors, including the system's design, algorithm, decision type, impact and data" (Government of Canada, 2019b).

At the subnational level, the City of Toronto is currently developing an AIA (Sieber et al., 2026). In a presentation at the monthly AI in Canadian municipalities Community of Practice, the city presented its draft AIA, a first for a local government in Canada (Sieber et al., 2026), which supports the city's Digital Infrastructure Strategic Framework (City of Toronto, 2022). The city first surveyed other jurisdictions who had AI policies and were considered to be best practices of AI governance prior to crafting the city's AIA.

A popular soft law practice in AI governance seen predominantly at the international level is a standard. The ISO/IEC 42001 - AI management system "specifies requirements for establishing, implementing, maintaining, and continually improving" AI systems in organizations with a focus on ensuring their responsible development and use. Particularly important for organizations is the ISO/IEC 42001 standard, which "sets out a structured way to manage risks and opportunities associated with AI, balancing innovation with governance" (International Organization for Standardization, 2025). Another process specific standard is the IEEE 3119-2025: IEEE Standard for the Procurement of AI and Automated Decision Systems. This standard was created for risk reduction in AI systems "using tailored risk management practices when purchasing AIS" (Institute of Electrical and Electronics Engineers, 2025). We may think of standards as controllers of products; however, many of these standards establish the definitive practices for processes.

International organizations work with EU member states on standards development. Here, international committees with specialized working groups play a crucial role in developing standards, supporting their harmonizations with AI regulation. For example, the CEN and CENELEC Joint Technical Committee 21 (JTC 21) is dedicated to developing European standards for AI, including harmonized standards in support of the EU AI Act (CEN/CENELEC, 2025). The long-term purpose of these standards is to

"provide companies with a legal presumption of conformity and ensure compliance with risk management, transparency, human oversight, cybersecurity, and quality assurance requirements" (CEN/CENELEC, 2025).

The US National Institute of Standards and Technology (NIST) AI Risk Management Framework represents a national standard, which establishes "a framework to better manage risks to individuals, organizations, and society associated with AI" (NIST, 2025). Launched in January 2023,

> the Framework was developed through a consensus-driven, open, transparent, and collaborative process that included a Request for Information, several draft versions for public comments, multiple workshops, and other opportunities to provide input. It is intended to build on, align with, and support AI risk management efforts by others (US NIST, 2025).

Interestingly, municipalities across Canada have relied on the US NIST Framework to draft their AI policy (Sieber et al., 2026).

Several data standards initiatives have become AI standard initiatives. One example of a national standard collaborative is the AI and Data Governance Standardization Collaborative, which was established in 2021 to standardize AI and data policy in Canada (Standards Council of Canada, 2026). The purpose of the Collaborative is to leverage standards and compliance mechanisms to support Canada's development in solidifying their role in AI and its governance nationally and internationally. More directly, the Collaborative was built to push back on supranational dominance in governance, especially from the private sector and multinational corporations that have a strong interest in leading standards and their processual underpinnings of interoperability or innovation.

The last form of soft law that will be discussed are AI registers (also called algorithmic registries) published by governments worldwide at multiple jurisdictional levels. Unlike some AIAs and most standards, AI registers are public.

National level AI registers have been created by the Netherlands, the UK, Scotland, and Canada. The Netherlands launched their registry in December 2022, which "contains information about algorithms used by the government. This makes this information findable and available to citizens, their advocates, the media and supervisors" (Government of the Netherlands, 2026). The UK also launched their AI register at the end of 2022. The purpose of the register is to "find algorithmic transparency records from UK public sector organisations with information on algorithmic tools used in decision making" (UK Government, 2026). The Government of Scotland launched their AI registry in March 2023 on the development and use of AI. The purpose of the register is to "get to know the basics of those AI systems, or examine them in more detail, based on your own interests" (Scottish Government, 2026). It also functions as an engagement measure where questions

and feedback are encouraged. The goal of registries is both to meet AI ethics principles and increase public trust.

Canada launched an AI register in November 2025 (Government of Canada, 2025b). Its purpose is to feature technology used in government at all stages of the AI lifecycle, whether in planning, development, deployment or implementation. Like other registers, it exists to advance AI governance efforts, specifically "responsible adoption of AI, governed by clear values, ethics, and rules" as well as retain the leadership role in AI governance (Government of Canada, 2026b).

Subnational registers actually predate national ones. Local level AI registers include Amsterdam, Netherlands and Helsinki and Saidot, Finland. The City of Amsterdam (2026) has published in its register various AIs used by the local government. Their public registers also include templates with descriptions for vendors to be used to add to the list of AI systems listed. The City of Helsinki (2026) has published a list of AI systems used in local government for various city services. Authors have written on these public AI registries, reiterating the values of openness, transparency and democracy as necessary rationales for their use (Haataja et al., 2020). Haataja et al. (2020) emphasize two key points about their register: "to be transparent about your algorithm use and to enable citizens to ask questions about it."

At the subnational levels, the Ontario Government created an AI register in 2022 (Ontario Government, 2026). Information includes AI use cases, the ministry they are a part of, as well as capabilities and specific attention to the presence of a human-in-the-loop. The register makes an important note about the evolution of AI and how its past features "may not be considered AI today." It also lists exclusions of systems such as AI use-cases that are not used by the public sector, sensitive AI use cases or ones that are Freedom of Information and Protection of Privacy Act exemptions as well as AI systems in the planning or design stages.

Research strengths in accountability reveal the many existing policy instruments in soft law that aim to assess and improve the impact of AI systems as well as diminish the harms. However, these accountability interventions are uneven across organizations, actors, and scales. Therefore research gaps in the types of accountability measures at different scales must be addressed.

4.3.2 Research gaps in accountability

As will be seen, accountability is complicated by the transjurisdictionality of AI systems because of the ability of many systems jumping borders and scales. Unfortunately, this scale jumping can allow for the diffusion of responsibilities, as accountability shifts across jurisdictional levels rather than being anchored at a specific scale. Scalar approaches to accountability draw on a broader discourse on the responsibility gaps in the AI discourse. In these "a-scalar" articles, authors sometimes characterize AI accountability as "fatalism", "deflationism", or "solutionism", which can contribute to more polarized perspectives in AI

governance discussions (Santoni de Sio & Mecacci, 2021, p. 1057). Indeed, as AI rapidly evolves and embeds across many aspects of our lives, these negative discourses will likely become more prominent, and research on accountability in AI will increase.

4.3.2.1 Gaps in hard law

Although hard law has been considered as possessing stronger potential for accountability, not all AI regulation is good regulation. We observe several examples of bad AI regulation. Although the EU AI Act is recognized as a gold standard for AI regulation, its ongoing refinements have rolled back many of the original rules. In its drafting, EU AI Act has removed "'red lines' of supposedly non-negotiable ethical principles...[and] diverts the rhetoric of protections into ineffective standards and irrelevant sub-clauses" (McQuillan, 2022, p. 39). At the 2025 AI Action Summit, the EU Commissioner reassured the EU's business interests that neither technical innovation nor competitive advantage would stagnate. Even with this reassurance, the EU AI Act is believed to be strangling European businesses as they struggle to compete against American companies (Moens & Bradshaw, 2025).

More recently, the US has rapidly shifted its AI regulation towards a defensive posture that lacks guardrails and accountability mechanisms across global supply chains of AI systems and services. The national policy framework for AI must "protect American rights, support innovation, and prevent a fragmented patchwork of state regulations that would hinder...national competitiveness, while respecting federalism and State rights" (US Government, 2026a, p. 4). Here we see an instance of national protectionism that supports a particular digital sovereignty strategy. An example of this regulation in practice is the US AI exports program promises to "deliver full-stack AI solutions to the global market." More precisely, the federal government supports US companies in delivering "American AI systems to global markets" (US Government, 2026b), while "establishing a Federal Policy Framework, Preempting Cumbersome State AI Laws" (US Government, 2026b). Novelli et al. (2024, p. 1871) warn that less refined regulations and generic definitions of accountability could mask "the implicit trade-offs among different political choices over which accountability regime should be enforced."

The US exemplifies little coordination across scales, especially in supra-national governance. This is likely due to a lack of appetite for hard law in government, the rapid pace of technological change, as well as pressures from the private sector and nationalist impulses expressed in digital sovereignty.

4.3.2.2 Gaps in soft law

AIAs have advanced and been popularized over the last half a decade. However, there is now a substantial critique of AIAs (Kaminski & Malgieri, 2020; Watkins et al., 2021). In their empirical research on AIAs, Ashar et al. (2024) find that the designers and implementers struggle with three issues: evaluating AI systems for fairness, bias and

representation, balancing organizational responsibilities, and resourcing and prioritizing to ensure responsible AI. AIAs differ from more established impact assessments like environmental impact assessments that often require mandatory compliance. Even with mandatory compliance, impact assessments do not necessarily make substantial changes in government, although they can "force administrative agencies to turn their analytic capacity towards particular issues, and require explicit and publicly reviewable identification, recognition, and explanation of their choices about them" (Mulligan & Bamberger, 2019, p. 843).

In an empirical analysis of published AIAs by the Canadian government, Brandusescu and Sieber (2025b) find that accountability falters through the design and implementation of AIAs due to uneven compliance across departments and agencies who submitted AI systems to be assessed. Another critical finding is that impacts and trade-offs of AI systems were invariably assessed as positive, obscuring the possibility of AI harms (Brandusescu & Sieber, 2025b).

The field of human-computer interaction has developed many computational audit tools. However, Ojewale et al. (2025) argue that the discourse should move beyond evaluation and towards accountability. As such, they highlighted Costanza-Chock et al. (2022), where out of the AI audit practitioners surveyed, approximately 65 percent "felt that "accountability" (defined as a "commitment from auditee to address problems covered by audit within set time") was a top unmet need in their AI auditing work" (Ojewale et al., 2025, p. 13). In the interviews both Constanza Chock et al. (2022) and Ojewale et al. (2025) find significant difficulty in successful auditing despite the best intent of the auditors. They found that some of the AI auditors did not have the right tools "for the complexity and scale of the systems being evaluated" (Ojewale et al., 2025, p. 6). Auditing is a labour-intensive activity for government; therefore we only find it at the nation-state or in major cities, such as New York City and Amsterdam.

AI registers are similarly well-intentioned government transparency solutions but appear insufficient to secure accountability. They offer yet another example of open government data becoming an end unto itself, even if transparency cannot ensure legal mechanisms exist to act consequent to disclosures. Booth (2024) investigates the UK AI register and finds only three AI systems published in two years of the database even though since February 2024 "there have been 164 contracts with public bodies that mention AI." In Canada, Das et al. (2026, p. 1) find that

> while 86% of [AI] systems are deployed internally for efficiency, the Register systematically obscures the human discretion, training, and uncertainty management required to operate them...the Register constructs an ontology of AI as "reliable tooling" rather than "contestable decision-making." [Therefore] without a shift in design, such transparency artifacts risk automating accountability into a performative compliance exercise, offering visibility without contestability.

Overall, we do not find sharp scale differences as gaps in soft law. However, accountability methods are costly and therefore subnational governments will likely be ill-equipped to develop and, more importantly, maintain AI systems. As governments develop, deploy and/or implement AI then they will be held accountable for that AI. Arguably, the need for accountability increases the closer governments (i.e., cities, remote communities, provinces/states) are to the public and more keenly their residents feel the impacts of AI (e.g., denial of social welfare). It is an expense that governments have to accommodate.

CHAPTER

05

Policy Implications and Recommendations

5. Policy Implications and Recommendations

We report on three policy implications with recommendations for this transformative technology and the investment Canada, at all jurisdictional levels, is making in AI. First, AI governance outside the national scale is shaped by dependencies across jurisdictions, raising concerns for national digital sovereignty. Second, public participation, the role of the Canadian public in AI policy, plays an important role across multiple scales but is fragmented and demands more attention and resources. Third, accountability efforts have proliferated along with AI developments; however, governments must pay closer attention to accountability maintenance, including continuous assessments, and infrastructure to support the public interest.

At minimum, the federal level should not attempt to standardize, but recognize and elevate AI governance across all scales. AI governance is occurring at subnational levels, in provinces and municipalities, as well as in Indigenous nations. Additionally, the federal government needs to coordinate, horizontally and vertically, these efforts as they exist and evolve.

5.1 Digital sovereignty trends in AI governance must balance national security and economic development goals

AI governance holds policy implications outside the national scale but is shaped by dependencies across jurisdictions, which raises concerns for national digital sovereignty. National security is increasingly linked to national digital sovereignty, where winning the AI arms race and ensuring national security becomes inextricable from how much endogenous AI capacity a country accumulates. A policy tension exists due to global supply chains. Generative AI relies on a series of algorithmic "stacks": layered sets of components such as data, models, algorithms, computing infrastructure and standards. The algorithmic stack, both layered and interoperable, is simultaneously situated here and elsewhere. To capture the stack, government will be required to assert control over various extrajurisdictional AI components by domestically sourcing AI components. However, the dependency on those global supply chains where national and subnational government systems can compromise security measures (Government of Canada, 2025a) as these supply chains seek to move fluidly across borders. These dynamics reveal the importance of AI governance to balance global dependencies, national security, digital sovereignty, and border control.

Additionally, these stacks create trade-offs between increasing economic development and building digital sovereignty. AI-related economic development relies on components developed across the world. Should a national or a subnational government wish to build domestic capacity, then the jurisdiction must participate in the global market,

not just of software (e.g., algorithms, data, models) but also of hardware (e.g., chip manufacturing).

Borders entail more than supply chain distribution of components required to build AI systems but increasingly rely on AI for tracking and surveillance. Unsurprisingly, geographers have written extensively on cross-border issues, especially when border control is digitally assisted (Amoore, 2019; 2020; Walker et al., 2021). Border technologies of AI (e.g., facial recognition technology, biometrics) have been found to excessively target marginalized groups in privacy-invasive ways for Black, brown people and Indigenous peoples as well as migrants (Molnar, 2024) and trans people (Reia et al., 2025). Therefore, we recommend a more balanced excitement around economic growth catapulted by the continuous and expanding investments in AI. We present three policy recommendations for the scalar effects of digital sovereignty.

First, governments at all scales should invest in an organizational infrastructure that enables AI governance, especially for subnational governments. Possessing a strong resource pool (e.g., assets, equipment, personnel) and robust governance frameworks are key for strengthening AI efforts. Federal and provincial officials can find methods to directly invest and support municipalities in AI development as well as "devise future frameworks and develop assistance plans for public bodies" (Mikalef et al., 2019, p. 276). Officials can invest in subnational governments by identifying common challenges that governments face and contributing to knowledge transfer across municipalities, while keeping in mind smaller and less resourced local governments that are pressured to innovate using emerging technologies (Mikalef et al., 2019). Moreover, investments could be made in building a sovereign public cloud where "pooling federal and provincial demand through arms-length Canadian sovereign compute providers...would build critical mass for domestic providers" (Khan & Mullin, 2026, p. 6).

Second, Canadian digital sovereignty should reconsider bilateral agreements and partnerships with foreign states and international partners as part of domestic security concerns. Studies have recommended Canada to reduce the reliance on international suppliers (CIRANO, 2025) by supporting small and medium sized enterprises "given that SMEs comprise the majority of all Canadian AI businesses despite their relatively small scale of resources to dedicate to standards development and implementation" (Schwartz Reisman Institute for Technology and Society, 2023, p. 33). With the push towards digital sovereignty, we may see greater importance for a domestic set of AI standards that still respond to innovations in AI and the needs of subnational entities. Besides reinforcing the role of AI standards, Canada recognizes the need to address the global AI supply chain. Within an ever-expanding and integrated algorithm stack, governments cannot deliver all components of AI systems in-house to balance national security objectives, even as they seek strategies to gain more control of AI systems and governance through systemic resilience mechanisms. For example, mechanisms, such as deliberately establishing redundancies across jurisdictions and enacting digital crisis management protocols will

improve data interoperability, which will strengthen national compute infrastructure (CIRANO, 2025).

Third, Canadian digital sovereignty must recognize and work in parallel with Indigenous sovereignty. Indigenous sovereignty is paramount to Canada because it is recognized in law here as well as internationally (Crown-Indigenous Relations and Northern Affairs Canada, 2011; OECD, 2020). Therefore participation by these nations-within-nations around issues of AI governance, data governance and AI standards setting "cannot be a box-ticking exercise" (Schwartz Reisman Institute for Technology and Society 2023, p. 33). Indigenous contributions in AI-related decision-making processes become vital to not repeat the failure of consultation of Indigenous peoples with AIDA and Bill C-27. Indeed, some of the "most valuable AI systems will be those that can have some application to decolonization or stewardship over waters and lands for current and future generations" (Schwartz Reisman Institute for Technology and Society, 2023, p. 26). As the Assembly of First Nations (2023, p. 8) affirms in their policy brief about AIDA:

> First Nations hold rights to data sovereignty—to own, control, access, and possess their data in keeping with their own worldviews. [AIDA] legislation offends those rights. [Canada must] meet [their] obligation to Nation-to-Nation consultations with First Nations and obtain their free, prior, and informed consent. Failing that, the Minister must clarify that the Act cannot be interpreted or applied in such a fashion as to derogate from First Nations rights.

Similarly, we should respect that Indigenous people are not merely stakeholders in the Canadian AI governance ecosystem (First Nations Information Governance Centre, 2026; Schwartz Reisman Institute for Technology and Society 2023) but possess existing or emergent AI governance frameworks. Therefore, actors in Canadian AI governance, whether government, academia or industry, can work in parallel with Indigenous groups, especially concerning the economic and political ramifications of AI governance (Assembly of First Nations, 2023).

5.2 Meaningful public participation in AI governance is crucial for building trust across scale

Public distrust in AI presents significant policy implications for enacting AI, regardless of jurisdictional level. AI literacy has been found to be insufficient by itself in improving public trust because literacy initiatives frequently are designed to convince the public to accept AI systems, not to question their development, application or impact (McQuillan, 2022). Alternate participation mechanisms are needed to gain the public's trust. Increasingly, citizen assemblies and citizen juries have been advocated as mechanisms for public participation in AI governance and have gained popularity at subnational levels but

they tend to be actualized as feedback sessions at a national level. Canada should reflect more on why, compared to other Western countries, its public exhibits high levels of public distrust in AI. Public distrust is likely to increase further with more recent citizen resistance to AI-related infrastructure, for example the development of new data centres. Edwards et al. (2025, p. 437) argue that "data centers are not neutral sites that operate without consequence, nor are they detached from the particular local histories and politics from which they operate". We present four policy recommendations around the scalar effects of public participation.

First, governments must centre the public's local experiences of AI. It is important that "new tools of AI Governance must place local lived experiences at their heart" (Davies & Colom, 2025). In reflecting on and making decisions about "controversial uses of AI, the public's views and, crucially, their values can help steer governance in the best interests of society. Citizen voice should be embedded in ethical AI" (Balaram et al., 2018, p. 10). AI ethics scholars argue that we also can gain insight from grassroots movements that have organized for non-AI social causes, including environmental concerns (Ananny, 2025; Davies & Colom, 2025; Savaget et al., 2019). This can take the shape of integrating those impacts of AI on high-level AI governance initiatives, such as the United Nations (UN) Independent International Scientific Panel on AI (Davies & Colom, 2025).

Environmental policy is particularly useful as it has an established multi-scalar governance process, which can inform the ability to address tensions across scales, so called "scalar collisions" of AI (Ananny, 2025). This can confront the universality or inevitability implied by generative AI systems. In these scalar collisions, powerful actors can act at multiple scales, in ways that overwhelm and overburden the capacity of smaller entities or act in ways that have little to do with public service values.

Second, governments should slow down AI adoption. Due to the various concerns raised in our report, we encourage deeper reflection on the rapid rates organizations are adopting and deploying AI. Sieber et al. (2026, p. 16) argue that

> Rather than rushing to deploy AI across departments or functions, a better practice is to start with small-scale, targeted applications and assess each step for fairness, transparency, and accountability. Such a gradual approach will mitigate public concern, build trust, and facilitate the involvement of residents in discussions around the technologies involved.

Expanding on AI literacy, there are numerous recommendations in relation to organizational culture of AI training and awareness as well as stakeholder management (Birkstedt et al., 2023). This can be scalar but not explicitly so, as Batool et al. (2025) found in their systematic review. We must be mindful of disparate resource allocations across scales especially for critical literacy and critical thinking in AI governance. Along with top-down federal and provincial initiatives, "AI awareness and education should come from

the bottom up: communities can build knowledge of how AI impacts them and can be regulated by them" (Attard-Frost et al., 2025).

Third and in tandem with above, governments should improve civic engagement efforts by investing in resources to conduct public participation. Davies et al. (2024, p. 37), who have presented on AI-related participation at the UN and elsewhere, have called for greater investment in deliberation at scale, where "funders should pool resources for a range of independently governed experiments in global deliberation on AI." McKinney & Chwalisz (2025) affirm that "scaling democratic deliberation is not a technological challenge alone, but one that requires a diverse repertoire of technological applications to be developed and fruitfully combined with strengthened civic infrastructure." Scaling participation is not beholden to the national level but requires significant funding for "citizen-led initiatives...both to kick-start new projects and to scale-up existing ones...not only to purchase eventual technologies and licenses, but also to allow citizens to dedicate their time to designing and running these projects" (Savaget et al., 2019, p. 375). Civic engagement improves when governments take seriously the fact that what constitutes civil society and what constitutes the public differs, especially in AI related participation (Sieber et al., 2024). Regardless of scale, accountability instruments like AIAs need to incorporate the public and civil society in their process. For example, in Canada, neither public or civil society were included in AIAs (Brandusescu & Sieber, 2025b).

Fourth, governments should support dissent in AI governance and public participation to increase public trust in AI. Governments must welcome healthy debate and discomfort around the spectrum of AI initiatives, including rejection of AI systems. Core to democratic discussions are a wide range of voices, opinions, expertise, experiences and feedback that cannot always be reduced to consensus. Research has shown that "When attached to political power, empowerment varies from providing feedback to giving participants the power to halt an algorithm or change laws and algorithmic decisions" (Sieber & Brandusescu, 2021, p. 5). Dissent also can represent a form of AI countergovernance, where localized and municipal governance initiatives "allow workplaces, organizations, and communities to build resources and power to determine if, when, and how AI should be adopted within specific contexts" (Attard-Frost et al., 2025).

5.3 Accountability in AI seeks to ensure effective AI governance for the public interest

Rapidly shifting norms, alignments, safety rules and regulations around AI leave gaps in accountability, which render governments, especially those possessing fewer resources, vulnerable to extrajurisdictional forces. Accountability in AI seeks effective AI governance for the public interest but it requires structures, practices and stakeholder management that align organizational goals with the use of AI. Accountability in future AI policy and governance decisions is particularly crucial at the local scale to connect, and at times,

protect communities from national and supranational interventions. Many arguments in the governance literature resonate with the critiques of the AI political economy, for example the tight connections of nation-states with Big Tech, and AI harm conducted locally and globally (Birhane, 2020). Policy implications are vast, encroaching on all aspects of our lives, and challenging due to powerful exogenous interests; even amidst this tumult, governments must enact accountability, however imperfect. We present four policy recommendations around accountability.

First, governments should improve workers' rights and labour laws impacted by AI. Governments have historically neglected non-public and private sector actors in discussions around AI. As AI dramatically impacts current and future jobs, governments at all levels will have to include labour rights in AI development and deployment. Posada (2020, p. 2) recommends integrating international law into AI governance, so that "fundamental human rights on labour [can] include the freedom of association and recognition of the right to collective bargaining, the elimination of forced labour, the abolition of child labour, discrimination, and equal remuneration." What may be more difficult for less resourced governments but still essential is balancing productivity with realistic abilities for workers to perform tasks. A humaneness is needed to the way we scale AI systems that can be managed and be accountable. (Raja & Zhou, 2023, p. 64) remind us that:

> If we want to develop a successful accountability system, we'll need to balance the scales of each part (for example, making sure the accountability is complete but not overly detailed) in order to produce workable accountability. Algorithms must be built in an empathetic and socially acceptable way which helps areas of accountability to prosper.

Second, governments should encourage mutual learning across governments at all scales. It is important to be flexible in an agile process for AI adoption, encourage cross-collaboration between intermunicipal, intramunicipal and external actors and organizations, as well as embed public participation as a key part of the AI governance process (Sieber et al., 2026). Organizations should continue learning from one another to improve policy tools. New auditing mechanisms continue to emerge so governments can share which are effective and what resources are required for maintenance (e.g., registers).

Effective AI governance may mean that actors devising accountability measures are open to learning to alter or abandon projects should the measure suggest negative project outcomes (Watkins et al., 2021). Accompanying mutual learning is mutual unlearning. With AI and with data, there is a need to "restructure the politics of scale" as "the stories and the data of the marginalized remain "small data" in their number, respect, and meaning" (Gieseking, 2018, p. 155). This can lead to greater awareness of impacts, including harms of AI systems on marginalized groups. As an example, government could devote resources in designing trans-friendly AI impact assessments and trans-inclusive adoption tools, by

creating “strategies to prevent harm that are the responsibility of multiple stakeholders” (Reia et al., 2025, p. 41). This demands “distributed responsibility [that] requires an accountability governance, together with technical solutions, to meet multiple accountabilities and close the accountability gaps” (Bracci, 2023, p. 739).

Third, governments must encourage the creation of robust AI governance frameworks at all scales. One-off customizable or patch-work solutions to AI bias, discrimination and harm will not be scalable or generalizable (Dafoe, 2018). As Ashar et al. (2024, p. 16) find in their study, product developers want certainty:

> how they should be prioritizing work and who should be making decisions, and more consistent guidance on how to report issues and progress... having a scorecard to prioritize the work on algorithmic harm, using model or system cards for more consistent reporting, tooling for automated monitoring and alerts, and support earlier in product life cycles to design for responsibility and safety.

Priyanshu et al. (2024) use popular AI governance frameworks, namely the US NIST AI Risk Management Framework and the EU AI Act to identify potential threats and propose mitigation strategies in Anthropic’s LLM-powered chatbot, Claude. They recommend “a comprehensive remediation process for data deletion and model unlearning will address concerns about data privacy and the potential misuse of personal information” (Priyanshu et al., 2024, p. 14), which could be adapted to government. Cheong (2024, p. 8) suggests that accountability should follow three virtues along with transparency and user privacy; governance frameworks “must be grounded in the fundamental ethical principles of respect for autonomy, beneficence, non-maleficence, and justice.”

At the same time, soft-law related principles and guidelines can be rendered meaningless if they can evade concrete actions in deriving or assigning accountability of AI systems and structures of power in AI governance. Paradoxically, as well, bottom-up accountability can be harmed even with excessive standardization of responsible and trustworthy processes. Hence, a balance must be found. What might help is having AI governance policies “prevent or minimize damage, and ensure redress for victims” (Novelli et al., 2024, p. 1880) customized to the specific scale and context.

Fourth, governments must invest in public interest technology. Globally and in Canada we hear calls for digital public infrastructures and public interest AI. Because of the problems caused by the proprietary nature of AI systems across the AI lifecycle, for example with vendor lock-in and system opacity (Lechterman, 2022; Widder et al., 2023), non-proprietary tech can offer an alternative. This also supports calls towards “collectively securing political autonomy in an age of rapid governance automation” by interrogating AI governance as “digital governance stacks” (Ortiz Freuler, 2026). Calls for digital public infrastructure include digital platforms, which “require innovation and design that meets local needs [where] there is no one-size-fits-all solution” (Sang et al., 2025) and support

"creat[ing] the conditions for more place-based innovation policy and effort" (Wylie, 2026). Localized policy implications are key for strengthening AI governance. One cautionary note is that equating public interest tech solely with economic development risks imagining the public desires for AI instead of heeding what the public actually wants with AI.

CHAPTER

06

Conclusion

6. Conclusion

AI governance must respond to the speed and scale at which AI advances to ensure responsible use. This agility to respond is complicated by an ongoing uncertainty over which jurisdictional level has control over AI governance, or whether an innovation that knows no borders can be bounded jurisdictionally. Different imaginings of scale can address the transjurisdictional complexities and interdependencies of AI governance, including the cross-border challenges posed to legal and regulatory frameworks and, more simply, the art of governing this opaque new digital technology. At the same time, we do not call for a universal standard to govern AI. In numerous instances, AI governance is best done in local communities.

This report shows how geographic scale provides new ways to address research strengths and gaps in AI governance. Issues of scale are often linked to AI governance, referring to the structures, practices and sets of stakeholders needed to accomplish an organization's goals around AI. We address research strengths and gaps in jurisdictions, public participation, and accountability in AI governance. The report focuses on geographic scale to address flows across jurisdictions and to help reconcile how situating AI governance within discrete jurisdictions may hinder our understanding of these flows. Literature on AI governance across a plethora of disciplines has been reviewed to track how and when it covers scale. A large number of governance models exist. AI governance often emphasizes advancing innovation. However, achieving best practices means support for good governance and resilient networks of actors. This includes building research collaborations and informing decision-making across public and private sectors. Best practices mean stronger connections between the research community and broader society to better understand key challenges impacting Canada's future, such as building public trust around government's use of AI. We trust that report findings will support future research agendas in AI governance and provide knowledge for robust governance practices.

CHAPTER

07

Knowledge Mobilization Activities

7. Knowledge mobilization activities

Report findings support the use of evidence in decision-making and the application of best practices in AI governance, as well as assist in developing future research agendas. We will engage with policymakers and practitioners at multiple jurisdictional levels, for instance at AI COP and the Federation of Canadian Municipalities. We already are engaging nationally, with our partners at the TBS, Canada Revenue Agency, and ISED, as well as with members of the Canadian Science Policy Conference in Ottawa. We also will leverage our international ties, at the AI Action Summit in Paris, AI Impact Summit in New Delhi, and the next summit in Geneva.

This report will help numerous actors involved in AI governance. The report will assist elected officials understand the complexities of AI governance customized to their level of government. It will better link governance to a trust built on more robust public participation. It will be particularly useful for municipal employees as they also seek best governance practices. Best practices in public accountability can be tailored to specific scales like municipalities, which promotes efficient use of resources.

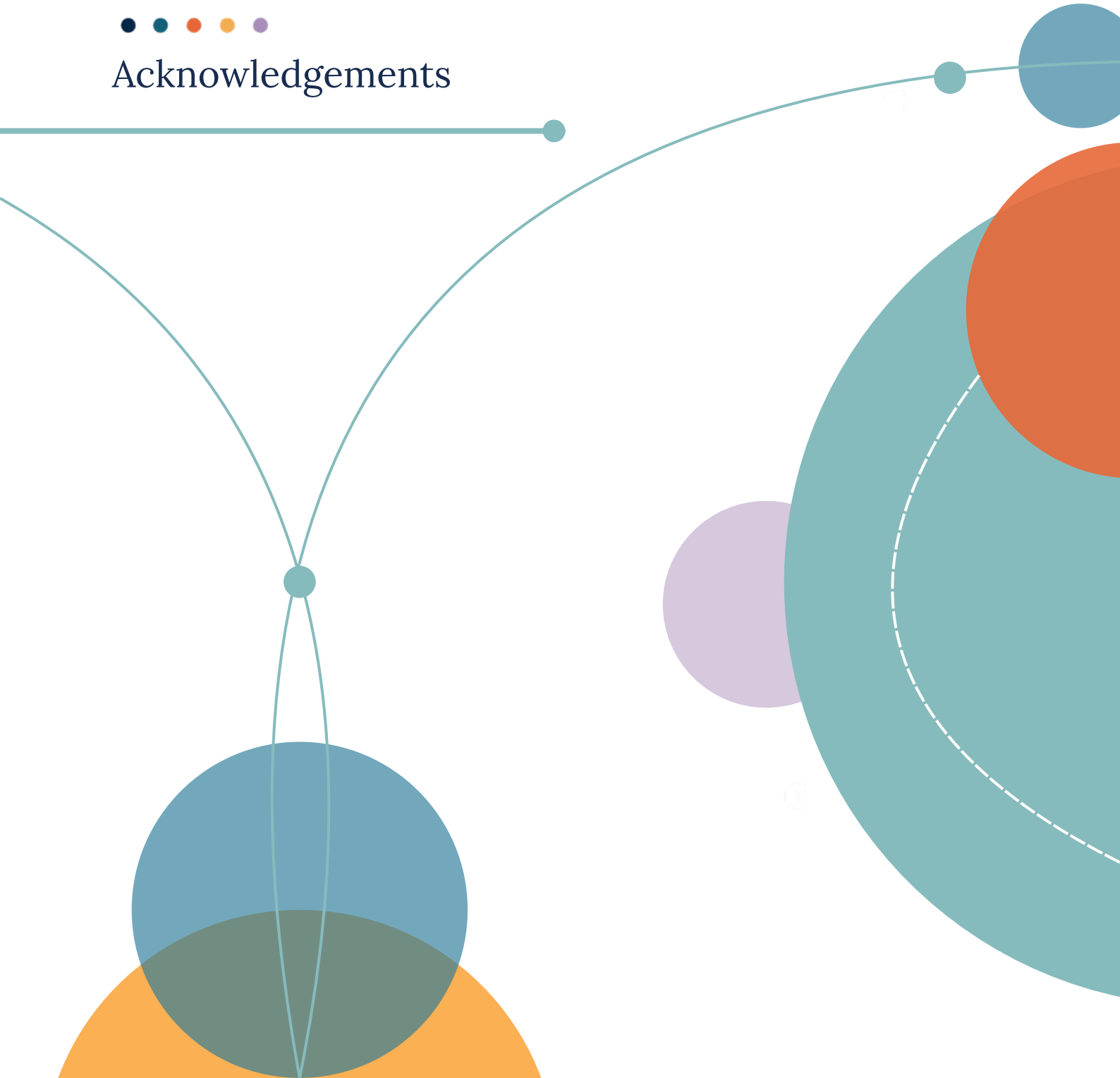
The report focuses on improving government relations across scales and with diverse stakeholders. We will strengthen collaborations between government entities and between government and academia by leveraging existing ties at organizations. It will highlight the value of scale-specific research on AI governance, connecting scholars across fields like computer science, policy, and geography.

Considering how global governance is impacted in an era of transjurisdictionality of AI, where AI effortlessly crosses borders, as well as the intersections of research fields such as AI governance, responsible AI, and civic participation in AI, we can share experiences with AI governance. Methodologically, the interdisciplinary research presented and policy content analyzed unpacks cross-jurisdictional roles and interactions, providing rich insights for researchers. Through a geographic lens we synthesized how institutional and jurisdictional scales influenced social relations and governance structures.

CHAPTER

08

Acknowledgements



8. Acknowledgements

We thank Kayleigh Christensen for translating the full report into French and Jonathan van Geuns for reviewing the full report. Geographic Scale in AI Governance: Research Strengths, Gaps, and Policy Implications is funded by the Social Sciences and Humanities Research Council, SSHRC 872-2024-0053. Le rapport « L'échelle géographique dans la gouvernance de l'IA : Les points forts et les lacunes de la recherche et les implications politiques » est financé par le Conseil de recherches en sciences humaines.

CHAPTER

09

Bibliography

9. Bibliography

Ada Lovelace Institute. (2021). The Citizens' Biometrics Council. Retrieved from https://www.adalovelaceinstitute.org/project/citizens-biometrics-council. Accessed April 19, 2026.

Alvarez Leon, L. F. (2021). AI and the capitalist space economy. *Space and Polity, 25*(2), 220-236. https://doi.org/10.1080/13562576.2021.1985852.

Amoore, L. (2019). Doubt and the algorithm: On the partial accounts of machine learning. *Theory, Culture & Society*, *36*(6), 147-169. https://doi.org/10.1177/0263276419851846.

Amoore, L. (2020). *Cloud ethics: Algorithms and the attributes of ourselves and others*. Duke University Press.

Ananny, M. (2025). AI Governance as scale work: synthetic journalism across scalar collisions. *Information, Communication & Society*, 1-11. https://doi.org/10.1080/1369118X.2025.2597508.

Arana-Catania, M., Lier, F. A. V., Procter, R., Tkachenko, N., He, Y., Zubiaga, A., & Liakata, M. (2021). Citizen participation and machine learning for a better democracy. *Digital Government: Research and Practice*, *2*(3), 1-22. https://doi.org/10.1145/3452118.

Ashar, A., Ginena, K., Cipollone, M., Barreto, R., & Cramer, H. (2024). Algorithmic impact assessments at scale: Practitioners' challenges and needs. *Journal of Online Trust and Safety, 2*(4). https://doi.org/10.54501/jots.v2i4.206.

Assembly of First Nations. (2023 October). Bill C-27: The Digital Charter Act, 2023 and First Nations Rights. *Brief by the Assembly of First Nations to the Parliamentary Standing Committee on Industry and Technology*. Retrieved from https://www.ourcommons.ca/Content/Committee/441/INDU/Brief/BR12885140/br-external/AssemblyOfFirstNations-e.pdf. Accessed March 15, 2026.

Attard-Frost, B., & Lyons, K. (2025). AI governance systems: A multi-scale analysis framework, empirical findings, and future directions. *AI and Ethics, 5*(3), 2557-2604. https://doi.org/10.1007/s43681-024-00569-5.

Attard-Frost, B., Brandusescu, A., & Lyons, K. (2024). The governance of artificial intelligence in Canada: Findings and opportunities from a review of 84 AI governance initiatives. *Government Information Quarterly*, *41*(2), 101929. https://doi.org/10.1016/j.giq.2024.101929.

Attard-Frost, B., Brandusescu, A., Widder, D.G., & Tessono, C. (2025). AI countergovernance: Lessons learned from Canada and Paris. *Tech Policy Press*. Retrieved from https://www.techpolicy.press/ai-countergovernance-lessons-learned-from-canada-and-paris/. Accessed April 19, 2026.

Balaram, B., Greenham, T., & Leonard, J. (2018). Artificial Intelligence: real public engagement. *RSA*, London. Retrieved from

https://www.thersa.org/wp-content/uploads/2025/06/rsa_artificial-intelligence-real-public-engagement.pdf. Accessed April 19, 2026.

Barnett, C., & Bridge, G. (2013). Geographies of radical democracy: Agonistic pragmatism and the formation of affected interests. *Annals of the Association of American Geographers*, *103*(4), 1022-1040. https://www.jstor.org/stable/23485684.

Batool, A., Zowghi, D., & Bano, M. (2025). AI governance: a systematic literature review. *AI and Ethics, 5*(3), 3265-3279. https://doi.org/10.1007/s43681-024-00653-w.

Birhane, A. (2020). Algorithmic colonization of Africa. *SCRIPTed, 17*, 389. DOI: 10.2966/scrip.170220.389.

Birkstedt, T., Minkkinen, M., Tandon, A., & Mäntymäki, M. (2023). AI governance: themes, knowledge gaps and future agendas. *Internet Research, 33*(7), 133-167. https://doi.org/10.1108/INTR-01-2022-0042.

Booth, R. (2024, November 28). UK government failing to list use of AI on mandatory register. *The Guardian*. Retrieved from https://www.theguardian.com/technology/2024/nov/28/uk-government-failing-to-list-use-of-ai-on-mandatory-register. Accessed April 19, 2026.

Bovens, M. (2007). Analysing and assessing accountability: A conceptual framework 1. *European Law Journal, 13*(4), 447-468. https://doi.org/10.1111/j.1468-0386.2007.00378.x.

Bracci, E. (2023). The loopholes of algorithmic public services: An "intelligent" accountability research agenda. *Accounting, Auditing & Accountability Journal, 36*(2), 739-763. DOI: 10.1108/AAAJ-06-2022-5856.

Brandusescu, A. (2021). Artificial intelligence policy and funding in Canada: Public investments, private interests. *Centre for Interdisciplinary Research on Montreal, McGill University*. Retrieved from https://www.mcgill.ca/centre-montreal/files/centre-montreal/aipolicyandfunding_report_updated_mar5.pdf. Accessed April 19, 2026.

Brandusescu, A., & Reia, J. (2022). Artificial intelligence in the city: Building civic engagement and public trust. *Centre for Interdisciplinary Research on Montreal, McGill University*. Retrieved from https://www.mcgill.ca/centre-montreal/files/centre-montreal/aipolicyandfunding_report_updated_mar5.pdf. Accessed April 19, 2026.

Brandusescu, A., & Sieber, R. E. (2025a). Missed opportunities in AI regulation: lessons from Canada's AI and data act. *Data & Policy, 7*, e40. https://doi.org/10.1017/dap.2025.17

Brandusescu, A., & Sieber, R. E. (2025b). Design versus reality: assessing the results and compliance of algorithmic impact assessments. *Digital Society, 4*(2), 64. https://doi.org/10.1007/s44206-025-00221-7.

Bria, F. (2024, October 15). The quest for European technological sovereignty: Building the EuroStack. *Tech Policy Press.* Retrieved from

https://www.techpolicy.press/the-quest-for-european-technological-sovereignty-building-the-eurostack/. Accessed April 19, 2026.

Brookings Institution. (2025, October 21). The American AI stack and the world. Retrieved from https://www.brookings.edu/events/the-american-ai-stack-and-the-world. Accessed April 20, 2026.

CEN/CENELEC. (2025). Artificial intelligence. Retrieved from https://www.cencenelec.eu/areas-of-work/cen-cenelec-topics/artificial-intelligence. Accessed April 19, 2026.

CMS Legal. (2026, February 17). AI laws and regulation in China. Retrieved from https://cms.law/en/int/expert-guides/ai-regulation-scanner/china. Accessed on April 16, 2026.

Centre for Media, Technology and Democracy. (2025). Gen(Z)AI forum reports. *Max Bell School of Public Policy, McGill University*. Retrieved from https://www.mediatechdemocracy.com/gen-z-ai#forum-reports. Accessed April 19, 2026.

Cheong, B. C. (2024). Transparency and accountability in AI systems: safeguarding wellbeing in the age of algorithmic decision-making. *Frontiers in Human Dynamics, 6*, 1421273. https://doi.org/10.3389/fhumd.2024.1421273.

City of Amsterdam. (2026). Algorithmic register. Municipality of Amsterdam. Retrieved from https://algoritmes.overheid.nl/en/organisatie/gm0363/gemeente-amsterdam. Accessed April 19, 2026.

City of Helsinki. (2026). Artificial intelligence systems of Helsinki: Learn about the use cases where we currently utilise artificial intelligence as part of our city services. Retrieved from https://ai.hel.fi/en/ai-register/. Accessed April 19, 2026.

City of Portland. (2026). BTS-4.04 - Artificial Intelligence Use and Governance. *Technology Services*. Retrieved from https://www.portland.gov/policies/technology-services/bts-404-artificial-intelligence-use-and-governance. Accessed April 19, 2026.

City of Toronto. (2022, March). Digital Infrastructure Strategic Framework. Retrieved from https://www.toronto.ca/city-government/accountability-operations-customer-service/longterm-vision-plans-and-strategies/connected-community/digital-infrastructure-strategicframework/. Accessed April 19, 2026.

CIRANO. (2025). Digital sovereignty and federalism: Data interoperability and AI governance. *CIRANO Burgundy Report*. Retrieved from https://cirano.qc.ca/files/publications/2025PR-12.pdf. Accessed April 19, 2026.

Conseil de l'innovation du Québec. (2024). Le Conseil de l'innovation dépose son rapport de recommandations : Prêt pour l'IA. Retrieved from https://conseilinnovation.quebec/rapport-de-recommandations-pret-pour-lia/. Accessed April 19, 2026.

Corrêa, N. K., Galvão, C., Santos, J. W., Del Pino, C., Pinto, E. P., Barbosa, C., ... & de Oliveira, N. (2023). Worldwide AI ethics: A review of 200 guidelines and recommendations for AI governance. *Patterns, 4*(10). https://www.cell.com/patterns/fulltext/S2666-3899(23)00241-6.

Costanza-Chock, S., Raji, I.D., & Buolamwini, J. (2022). Who audits the auditors? Recommendations from a field scan of the algorithmic auditing ecosystem. In *Proceedings of the 2022 ACM Conference on Fairness, Accountability, and Transparency(FAccT '22)*. Association for Computing Machinery, New York, NY, USA, 1571–1583.

Couture, S., Toupin, S., & Mayoral Baños, A. (2024). Resisting and claiming digital sovereignty: The cases of civil society and Indigenous groups. *Policy & Internet, 16*(4), 739-749. https://doi.org/10.1002/poi3.434.

Crown-Indigenous Relations and Northern Affairs Canada. (2011). A history of treaty-making in Canada. Retrieved from https://www.rcaanc-cirnac.gc.ca/eng/1314977704533/1544620451420. Accessed April 19, 2026.

Current AI. (2026). Building AI together, unlocking opportunity for all. Retrieved from https://www.currentai.org/. Accessed April 19, 2026.

Dafoe, A. (2018). AI governance: A research agenda. Retrieved from https://cdn.governance.ai/GovAI-Research-Agenda.pdf. Accessed April 19, 2026.

Darbyshire, T. (2022, May 5). In praise of the Canadian Algorithmic Impact Assessment framework. *TechUK*. Retrieved from https://www.techuk.org/resource/in-praise-of-the-canadian-algorithmic-impact-assessment-framework.html. Accessed April 19, 2026.

Das, D., Tessono, C., Ahmed, S. I., & Guha, S. (2026). Bureaucratic silences: What the Canadian AI register reveals, omits, and obscures. In *Proceedings of the 2026 ACM conference on fairness, accountability, and transparency*. Montreal, June 25-28. Retrieved from https://www.diptodas.net/assets/pdf/FACCT26_AIregister.pdf. Accessed April 20, 2026.

Data Justice Lab. (2021). Advancing civic participation in algorithmic decision-making: A guidebook for the public sector. Retrieved from https://datajusticelab.org/wp-content/uploads/2021/06/PublicSectorToolkit_english.pdf. Accessed April 19, 2026.

David, P., Choung, H., & Seberger, J. S. (2024). Who is responsible? US Public perceptions of AI governance through the lenses of trust and ethics. *Public Understanding of Science, 33*(5), 654-672. https://doi.org/10.1177/09636625231224592.

Davies, T. (2024, September 18). Global citizen deliberation on artificial intelligence: Options and design considerations. *Connected by Data.* Retrieved from https://connectedbydata.org/resources/global-deliberation-ai. Accessed April 19, 2026.

Davies, T., Mellier, C., Shilongo, K., & Wilson, R. (2024, September). Global citizen deliberation on artificial intelligence options and design considerations. *Connected by Data.* Retrieved from https://connectedbydata.org/resources/global-deliberation-ai. Accessed April 19, 2026.

Davies, T., & Colom, A. (2025, October 2). The UN's Global Dialogue on AI must give citizens a real seat at the table. *Tech Policy Press.* Retrieved from https://www.techpolicy.press/the-uns-global-dialogue-on-ai-must-give-citizens-a-real-seat-at-the-table/. Accessed April 19, 2026.

De Almeida, P. G. R., Dos Santos, C. D., & Farias, J. S. (2021). Artificial intelligence regulation: a framework for governance. *Ethics and Information Technology*, *23*(3), 505-525. https://doi.org/10.1007/s10676-021-09593-z.

Donahoe, E., & Metzger, M. M. (2019). Artificial intelligence and human rights. *Journal of Democracy, 30*(2), 115–126. https://www.journalofdemocracy.org/articles/artificial-intelligence-and-human-rights/.

Downe-Wamboldt, B. (1992). Content analysis: method, applications, and issues. *Health Care for Women International, 13*(3), 313-321. https://doi.org/10.1080/07399339209516006.

Edelman Trust Barometer. (2024). 2024 Edelman trust barometer: Canada report. Retrieved from https://www.edelman.ca/sites/g/files/aatuss376/files/2024-03/2024%20Edelman%20Trust%20Barometer_Canada%20Report_EN_0.pdf. Accessed April 19, 2026.

Edwards, D., Cooper, Z. G. T., & Hogan, M. (2025). The making of critical data center studies. *Convergence, 31*(2), 429-446. https://doi.org/10.1177/13548565231224157.

European Union. (2022). The French SA fines Clearview AI EUR 20 million. *European Data Protection Board.* Retrieved from https://www.edpb.europa.eu/news/national-news/2022/french-sa-fines-clearview-ai-eur-20-million_en. Accessed April 19, 2026.

European Union. (2024). EU AI Act. *European Parliament.* Retrieved from https://artificialintelligenceact.eu. Accessed April 19, 2026.

First Nations Information Governance Centre. (2026). The First Nations Principles of OCAP®. Retrieved from https://fnigc.ca/ocap-training. Accessed April 19, 2026.

Floridi, L., Cowls, J., King, T. C., & Taddeo, M. (2021). How to design AI for social good: Seven essential factors. In *Ethics, governance, and policies in artificial intelligence* (pp. 125-151). Cham: Springer International Publishing. https://doi.org/10.1007/s11948-020-00213-5.

Gasser, U., & Almeida, V. A. (2017). A layered model for AI governance. *IEEE Internet Computing, 21*(6), 58-62. https://doi.org/10.1109/MIC.2017.4180835.

Gieseking, J. J. (2018). Size matters to lesbians, too: Queer feminist interventions into the scale of big data. *The Professional Geographer, 70*(1), 150–156. https://doi.org/10.1080/00330124.2017.1326084.

Glasze, G., Cattaruzza, A., Douzet, F., Dammann, F., Bertran, M. G., Bômont, C., ... & Zanin, C. (2023). Contested spatialities of digital sovereignty. *Geopolitics, 28*(2), 919-958. https://doi.org/10.1080/14650045.2022.2050070.

Grohmann, R., & Costa Barbosa, A. (2025). Sovereignty-as-a-service: How big tech companies co-opt and redefine digital sovereignty. *Media, Culture & Society*, 01634437251395003. https://doi.org/10.1177/01634437251395003.

Government of Canada. (2019). Algorithmic Impact Assessment tool. *Treasury Board of Canada Secretariat.* Retrieved from https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/algorithmic-impact-assessment.html. Accessed April 19, 2026.

Government of Canada. (2025a, October 31). Digital sovereignty: A Framework to improve digital readiness of the Government of Canada. Retrieved from https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/cloud-services/digital-sovereignty/digital-sovereignty-framework-improve-digital-readiness.html. Accessed April 19, 2026.

Government of Canada. (2025b, November). Canada launches first register of AI uses in federal government. *Treasury Board of Canada Secretariat*. Government of Canada. https://www.canada.ca/en/treasury-board-secretariat/news/2025/11/canada-launches-first-register-of-ai-uses-in-federal-government.html. Accessed April 19, 2026.

Government of Canada. (2026a, January). Engagements on Canada's next AI Strategy: Summary of inputs. *Innovation, Science, and Economic Development Canada*. Retrieved from https://ised-isde.canada.ca/site/ised/en/public-consultations/engagements-canadas-next-ai-strategy-summary-inputs. Accessed April 19, 2026.

Government of Canada. (2026b). Government of Canada AI Register (Minimum Viable Product). Open Government. *Treasury Board of Canada Secretariat*. Retrieved from https://open.canada.ca/data/en/dataset/fcbc0200-79ba-4fa4-94a6-00e32facea6b. Accessed April 19, 2026.

Government of China. (2026). Trial Measures for Ethical Review and Service of Artificial Intelligence Technology. *Ministry of Industry and Information Technology*. Retrieved from https://www.miit.gov.cn/zwgk/zcwj/wjfb/tz/art/2026/art_c5039010f5d24e1593152a9355f9c51c.html. Accessed April 19, 2026.

Government of the Netherlands. (2026). Algorithmic register. Retrieved from https://algoritmes.overheid.nl/en. Accessed April 19, 2026.

Hagendorff, T. (2019). The ethics of AI ethics--an evaluation of guidelines. arXiv preprint *arXiv:1903.03425*. https://doi.org/10.1007/s11023-020-09517-8.

Haataja, M., van de Fliert, L., & Rautio, P. (2020). Public AI registers: Realising AI transparency and civic participation in government use of AI. Retrieved from

https://openresearch.amsterdam/en/page/73074/public-ai-registers. Accessed April 19, 2026.

Hadfield, G. K., & Clark, J. (2023). Regulatory markets: The future of AI governance. *arXiv preprint arXiv:2304.04914*.

Hanna, A., & Park, T.M. (2020). Against scale: provocations and resistances to scale thinking. ArXiv:2010.08850 [Cs], October. http://arxiv.org/abs/2010.08850.

Hogan, M. (2021). The data center industrial complex. In Jue, M., & Ruiz, R. (eds.) *Saturation: An elemental politics*, 283-305. Duke University Press. https://doi.org/10.1215/9781478013044-017.

Humboldt Institute for Internet and Society. (2026). Public interest AI. Retrieved from https://publicinterest.ai. Accessed April 19, 2026.

Institute of Electrical and Electronics Engineers. (2025, May 23). IEEE 3119-2025: IEEE standard for the procurement of artificial intelligence and automated decision systems. Retrieved from https://standards.ieee.org/ieee/3119/10729/. Accessed April 19, 2026.

International Organization for Standardization. (2025). ISO/IEC 42001 - AI Management System. Retrieved from https://www.iso.org/obp/ui/en/#iso:std:iso-iec:42001:ed-1:v1:en. Accessed April 19, 2026.

Janssen, M., Brous, P., Estevez, E., Barbosa, L. S., & Janowski, T. (2020). Data governance: Organizing data for trustworthy artificial intelligence. *Government Information Quarterly, 37*(3), 101493. https://doi.org/10.1016/j.giq.2020.101493.

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nature Machine Intelligence, 1*(9), 389-399. https://doi.org/10.1038/s42256-019-0088-2.

Jobin, A., Guettel, L., Liebig, L., & Katzenbach, C. (2021). AI federalism: Shaping AI policy within states in Germany. *arXiv preprint*. https://arxiv.org/pdf/2111.04454.

Kaminski, M. E., & Malgieri, G. (2021). Algorithmic impact assessments under the GDPR: producing multi-layered explanations. *International Data Privacy Law, 11*(2), 125-144. https://doi.org/10.1093/idpl/ipaa020.

Karma, R. (2025, December 10). Something ominous is happening in the AI economy. *The Atlantic*. Retrieved from https://www.theatlantic.com/economy/2025/12/nvidia-ai-financing-deals/685197. Accessed April 19, 2026.

Khan, J., & Mullin, S. (2026, March). Sovereign by design: Strategic options for Canadian AI sovereignty. *Munk School of Global Affairs & Public Policy, University of Toronto*. Retrieved from https://aicompetitiveness.ca/. Accessed April 19, 2026.

Lam, J., & Solomun, S. (2025). Reclaiming democracy: Civic power in the age of AI. Deliberative Approaches to Inclusive Governance. *Centre for Media, Technology and Democracy, Max Bell School of Public Policy, McGill University*. Retrieved from https://www.mediatechdemocracy.com/deliberative-approaches-to-inclusive-governance. Accessed April 19, 2026.

Lauriault, T. P. (2012). *Data, infrastructures and geographical imaginations* (Doctoral dissertation, Carleton University).

Lechterman, T. M. (2022). The concept of accountability in AI ethics and governance. *The Oxford Handbook of AI Governance*, 164-182. https://doi.org/10.1093/oxfordhb/9780197579329.013.10.

Low, M. (2009). Cities as Spaces of Democracy: Complexity, Scale, and Governance. In: Geenens, R., Tinnevelt, R. (eds) *Does Truth Matter?*. Springer, Dordrecht. https://doi.org/10.1007/978-1-4020-8849-0_9.

Lunau, K. (2026, January 15). Evan Solomon wants Canada to trust AI. Can we trust Evan Solomon? *The Walrus*. Retrieved from https://thewalrus.ca/evan-solomon-ai. Accessed April 19, 2026.

Marcucci, S., Kalkar, U., & Verhulst, S. (2020). AI localism in practice: Examining how cities govern AI. *The GovLab*. Retrieved from https://files.thegovlab.org/ailocalism-in-practice.pdf. Accessed April 19, 2026.

McKelvey, F., Toupin, S., & Roberge, J. (Eds.), *Northern Lights and Silicon Dreams: AI Governance in Canada (2011-2022)* (pp. 31-41). Montreal, Canada. Retrieved from https://www.amo-oma.ca/en/ai-policy-report. Accessed April 19, 2026.

McKinney, S., & Chwalisz, C. (2025). Five dimensions of scaling democratic deliberation: With and beyond AI. *DemocracyNext.* Retrieved from https://www.demnext.org/projects/five-dimensions-of-scaling-democratic-deliberation-with-and-beyond-ai. Accessed April 19, 2026.

McQuillan, D. (2022). *Resisting AI: An anti-fascist approach to artificial intelligence*. Bristol University Press.

Miceli, M., Posada, J., & Yang, T. (2022). Studying up machine learning data: Why talk about bias when we mean power?. *Proceedings of the ACM on human-computer interaction*, 6(GROUP), 1-14. https://doi.org/10.1145/3492853.

Mikalef, P., Fjørtoft, S. O., & Torvatn, H. Y. (2019, August). Artificial Intelligence in the public sector: a study of challenges and opportunities for Norwegian municipalities. In *Conference on e-Business, e-Services and e-Society* (pp. 267-277). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-29374-1_22.

MNP Municipal Report. (2025). AI in action: Powering Canada's local governments. Retrieved from https://www.mnp.ca/en/industries/public-sector/2025-municipal-report. Accessed April 19, 2026.

Moats, D., & Ganguly, C. (2025). Bringing AI participation down to scale. *Patterns, 6*(5). https://doi.org/10.1016/j.patter.2025.101241.

Moens, B., & Bradshaw, T. (2025, July 2). European CEOs urge Brussels to halt landmark AI Act. *Financial Times*. Retrieved from https://www.ft.com/content/a825759e-aec8-4184-bc73-f604f169204c. Accessed April 21, 2026.

Molnar, P. (2024). *The walls have eyes: Surviving migration in the age of artificial intelligence*. The New Press.

Moss, E., Watkins, E. A., Singh, R., Elish, M. C., & Metcalf, J. (2021). Assembling accountability: Algorithmic impact assessment for the public interest. *Data & Society*. Retrieved from https://datasociety.net/library/assembling-accountability-algorithmic-impact-assessment-for-the-public-interest/. Accessed April 19, 2026.

Mügge, D. (2024). EU AI sovereignty: For whom, to what end, and to whose benefit?. *Journal of European Public Policy, 31*(8), 2200-2225. https://doi.org/10.1080/13501763.2024.2318475.

Mulligan, D. K., & Bamberger, K. A. (2019). Procurement as policy: Administrative process for machine learning. *Berkeley Tech. LJ, 34*, 773.

NIST. (2023). AI Risk Management Framework. Retrieved from https://www.nist.gov/itl/ai-risk-management-framework. Accessed April 19, 2026.

Novelli, C., Taddeo, M., & Floridi, L. (2024). Accountability in artificial intelligence: what it is and how it works. *AI & SOCIETY, 39*(4), 1871-1882. https://doi.org/10.1007/s00146-023-01635-y.

OECD. (2020). Linking Indigenous Communities with Regional Development in Canada. *OECD Rural Policy Reviews*. OECD Publishing, Paris. https://doi.org/10.1787/fa0f60c6-en.

Ojewale, V., Steed, R., Vecchione, B., Birhane, A., & Raji, I. D. (2025, April). Towards AI accountability infrastructure: Gaps and opportunities in AI audit tooling. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (pp. 1-29).

Ontario Government. (2024). Bill 194, Strengthening Cyber Security and Building Trust in the Public Sector Act, 2024. *Legislative Assembly of Ontario*. Retrieved from https://www.ola.org/en/legislative-business/bills/parliament-43/session-1/bill-194 Accessed April 20, 2026.

Ontario Government. (2025). Bill 61, Ontario Artificial Intelligence, Talent and Innovation Strategy Act, 2025. *Legislative Assembly of Ontario*. Retrieved from https://www.ola.org/en/legislative-business/bills/parliament-44/session-1/bill-61 Accessed April 20, 2026.

Ontario Government. (2026). Artificial Intelligence (AI) use cases in the Ontario Public Service. Data Catalogue. *Public and Business Service Delivery and Procurement*. Retrieved from https://data.ontario.ca/dataset/artificial-intelligence-ai-use-cases-in-the-ontario-public-service. Accessed April 19, 2026.

Ortiz Freuler, J. (2026, February 25). Digital Governance Stacks and the Infrastructure of Empires. *Bot Populi*. Retrieved from

https://botpopuli.net/digital-governance-stacks-and-the-infrastructure-of-empires. Accessed April 19, 2026.

PAIRS. (2026). Participatory AI Research & Practice Symposium. Retrieved from https://www.pairs.site. Accessed April 19, 2026.

Petit, P., & Oleart, A. (2026). Citizenwashing EU tech policy: EU deliberative mini-publics on virtual worlds and artificial intelligence. *Politics and Governance*, 14. https://doi.org/10.17645/pag.10468.

Pohle, J., & Thiel, T. (2020). Digital sovereignty. *Internet Policy Review, 9*(4). DOI: 10.14763/2020.4.1532.

Pohle, J., Nanni, R., & Santaniello, M. (2024). Unthinking digital sovereignty: A critical reflection on origins, objectives, and practices. *Policy & Internet*, *16*(4), 666-671. https://doi.org/10.1002/poi3.437.

Posada, J. (2020). From development to deployment: For a comprehensive approach to ethics of AI and labour. *AoIR Selected Papers of Internet Research.*

Priyanshu, A., Maurya, Y., & Hong, Z. (2024). AI governance and accountability: An analysis of Anthropic's Claude. *arXiv preprint.* https://arxiv.org/abs/2407.01557.

Public Safety Canada. (2020). Facial Recognition Lawsuit – Clearview AI. Retrieved from https://www.publicsafety.gc.ca/cnt/trnsprnc/brfng-mtrls/prlmntry-bndrs/20201119/023. Accessed April 19, 2026.

Rahwan, I. (2018). Society-in-the-loop: programming the algorithmic social contract. *Ethics and Information Technology, 20*(1), 5-14. https://doi.org/10.1007/s10676-017-9430-8.

Raja, A. K., & Zhou, J. (2023). AI accountability: Approaches, affecting factors, and challenges. *Computer, 56*(4), 61-70. https://ieeexplore.ieee.org/abstract/document/10098221.

Reia, J., Leach, R. & Li, S. (2025). Trans digital rights: Improving data visibility, privacy and belonging for gender-diverse communities. *Digital Technology for Democracy Lab, University of Virginia.* https://doi.org/10.18130/m2zw-2g87.

Reis, J., Santo, P., & Melão, N. (2020). Artificial intelligence research and its contributions to the European Union's political governance: comparative study between member states. *Social Sciences, 9*(11), 207. https://doi.org/10.3390/socsci9110207.

Raji, I. D., Smart, A., White, R. N., Mitchell, M., Gebru, T., Hutchinson, B., ... & Barnes, P. (2020, January). Closing the AI accountability gap: Defining an end-to-end framework for internal algorithmic auditing. In *Proceedings of the 2020 conference on fairness, accountability, and transparency* (pp. 33-44). https://doi.org/10.1145/3351095.3372873.

Rosen, J., & Álvarez León, L. F. (2022). The digital growth machine: Urban change and the ideology of technology. *Annals of the American Association of Geographers, 112*(8), 2248-2265. https://doi.org/10.1080/24694452.2022.2052008.

Sambuli, N. (2021, September 15). Five challenges with multistakeholder initiatives on AI. Artificial Intelligence & Equality Initiative. *Carnegie Council for Ethics in*

International Affairs. Retrieved from https://www.carnegiecouncil.org/media/article/five-challenges-with-multistakeholder-initiatives-on-ai. Accessed April 19, 2026.

Sang, D., Munga, J., & Sambuli, N. (2025). Digital public infrastructure: A practical approach for Africa. *Carnegie Endowment for International Peace*. Retrieved from https://carnegieendowment.org/research/2025/02/digital-public-infrastructure-a-practical-approach-for-africa. Accessed April 19, 2026.

Santoni de Sio, F., & Mecacci, G. (2021). Four responsibility gaps with artificial intelligence: Why they matter and how to address them. *Philosophy & Technology, 34*(4), 1057-1084. https://doi.org/10.1007/s13347-021-00450-x.

Sassen, S. (2005). The many scales of the global: Implications for theory and for politics. *Critical Globalization Studies*, 155-66.

Savaget, P., Chiarini, T., & Evans, S. (2019). Empowering political participation through artificial intelligence. *Science and Public Policy, 46*(3), 369-380. https://doi.org/10.1093/scipol/scy064.

Schaefer, C., Lemmer, K., Samy Kret, K., Ylinen, M., Mikalef, P., & Niehaves, B. (2021). Truth or dare?–how can we influence the adoption of artificial intelligence in municipalities? *Proceedings of the 54th Hawaii International Conference on System Sciences*. https://doi.org/10.24251/hicss.2021.286.

Schwartz Reisman Institute for Technology and Society. (2023, January). Discerning signal from noise: The state of global AI standardization and what it means for Canada. *Standards Council of Canada.* Retrieved from https://scc-ccn.ca/resources/publications/discerning-signal-noise-state-global-ai-standardization-and-what-it-means. Accessed April 19, 2026.

Seaver, N. (2021). Care and scale: Decorrelative ethics in algorithmic recommendation. *Cult. Anthropol. 36*, 509–537. https://doi.org/10.14506/ca36.3.11.

Selbst, A. D. (2021). An institutional view of algorithmic impact assessments. *Harv. JL & Tech., 35*, 117. https://heinonline.org/HOL/LandingPage?handle=hein.journals/hjlt35&div=6&id=&page

Sharma, G. D., Yadav, A., & Chopra, R. (2020). Artificial intelligence and effective governance: A review, critique and research agenda. *Sustainable Futures, 2*, 100004.

Sieber, R., & Brandusescu, A. (2021, June 30). Final Report. FAccT CRAFT: Civic empowerment in the development and deployment of AI Systems. *Critiquing and Rethinking Accountability, Fairness and Transparency Workshop at ACM's Fairness, Accountability and Transparency in Machine Learning*. Montreal, Canada. Retrieved from https://aifortherestofus.ca/wp-content/uploads/2021/10/Civic-Empowerment-Workshop-Report-FAccT_CRAFT.pdf. Accessed April 19, 2026.

Sieber, R., Brandusescu, A., Adu-Daako, A., & Sangiambut, S. (2024). Who are the publics engaging in AI?. *Public Understanding of Science, 33*(5), 634-653. https://doi.org/10.1177/09636625231219853.

Sieber, R., Brandusescu, A., Sangiambut, S., & Adu-Daako, A. (2025). What is civic participation in artificial intelligence?. *Environment and Planning B: Urban Analytics and City Science, 52*(6), 1388-1406. https://doi.org/10.1177/23998083241296200.

Sieber, R.E., Brandusescu, A., & van Geuns, J. (2026). Building AI governance in municipalities from the ground up. In: *Canada's urban infrastructure deficit: Toward democracy & equitable prosperity. School of Cities, University of Toronto*. Retrieved from https://schoolofcities.utoronto.ca/research-publications/infrastructure-deficit. Accessed April 19, 2026.

Simpson, W. (2026, February 4). Global AI law and policy tracker: Highlights and takeaways. *International Association of Privacy Professionals.* Retrieved from https://iapp.org/news/a/global-ai-law-and-policy-tracker-highlights-and-takeaways. Accessed April 19, 2026.

Smuha, N. A. (2021). Beyond the individual: governing AI's societal harm. *Internet Policy Review, 10*(3). DOI: 10.14763/2021.3.1574.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333-339. https://doi.org/10.1016/j.jbusres.2019.07.039.

Standards Council of Canada. (2026). AI and Data Governance Standardization Collaborative. Retrieved from https://scc-ccn.ca/areas-work/digital-technology/ai-and-data-governance-standardization-collaborative. Accessed April 19, 2026.

Tessono, C., Stevens, Y., Malik, M.M., Solomun, S., Dwivedi, S., & Andrey, S. (2022). AI oversight, accountability and protecting human rights: Comments on Canada's proposed Artificial Intelligence and Data Act. *Submission to the Standing Committee on Industry and Technology on Bill C-27.* Retrieved from https://www.ourcommons.ca/Content/Committee/441/INDU/Brief/BR12444167/br-external/CenterForInformationTechnologyPolicy-e.pdf. Accessed March 6, 2026.

Timmers, P. (2023). Sovereignty in the digital age. In *Introduction to Digital Humanism: A Textbook* (pp. 571-592). Cham: Springer Nature Switzerland.

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356-367. https://doi.org/10.1177/1534484305278283.

Tu, M. Y.-P. (2025, May 22). AI threatens Indigenous data sovereignty and digital self-determination. *Policy Options*. Retrieved from https://policyoptions.irpp.org/2025/05/ai-indigenous-data. Accessed April 19, 2026.

UK Government. Algorithmic Transparency Recordings. Retrieved from https://www.gov.uk/algorithmic-transparency-records. Accessed April 19, 2026.

US Government. (2025, December 11). Ensuring a national policy framework for artificial intelligence. Retrieved from https://www.whitehouse.gov/presidential-actions/2025/12/eliminating-state-law-obstruction-of-national-artificial-intelligence-policy. Accessed April 19, 2026.

US Government. (2026a). A National Policy Framework for Artificial Intelligence. Retrieved from https://www.whitehouse.gov/wp-content/uploads/2026/03/03.20.26-National-Policy-Framework-for-Artificial-Intelligence-Legislative-Recommendations.pdf. Accessed April 19, 2026.

US Government. (2026b). American AI exports program. Retrieved from https://aiexports.gov/. Accessed April 19, 2026.

Veale, M., & Borgesius, F.Z. (2021). Demystifying the draft EU Artificial Intelligence Act—Analysing the good, the bad, and the unclear elements of the proposed approach. *Computer Law Review International 22*(4), 97-112. https://doi.org/10.9785/cri-2021-220402.

Veale, M., Matus, K., & Gorwa, R. (2023). AI and global governance: Modalities, rationales, tensions. *Annual Review of Law and Social Science, 19*(1), 255-275. https://doi.org/10.1146/annurev-lawsocsci-020223-040749.

Walker, M., & Winders, J. (2021). Where is artificial intelligence? Geographies, ethics, and practices of AI. *Space and Polity, 25*(2), 163-166. https://doi.org/10.1080/13562576.2021.1985869.

Walker, M., Winders, J., & Boamah, E. F. (2021). Locating artificial intelligence: A research agenda. *Space and Polity, 25*(2), 202-219. https://doi.org/10.1080/13562576.2021.1985868.

Wan, S., & Sieber, R. (2025). To "in-house" or to outsource? Artificial intelligence in Canadian local governments. *Journal of Urban Technology, 32*(3), 71-91. https://doi.org/10.1080/10630732.2025.2477993.

Watkins, E. A., Moss, E., Metcalf, J., Singh, R., & Elish, M. C. (2021). Governing algorithmic systems with impact assessments: Six observations. In *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society* (pp. 1010-1022). https://doi.org/10.1145/3461702.3462580.

White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. *Library Trends, 55*(1), 22-45. https://dx.doi.org/10.1353/lib.2006.0053.

Whittemore, R., & Knafl, K. (2005). The integrative review: updated methodology. *Journal of Advanced Nursing, 52*(5), 546-553. https://doi.org/10.1111/j.1365-2648.2005.03621.x.

Widder, D. G., Whittaker, M., & West, S. M. (2024). Why 'open'AI systems are actually closed, and why this matters. *Nature, 635*(8040), 827-833. https://doi.org/10.1038/s41586-024-08141-1.

Wieringa, M. (2020, January). What to account for when accounting for algorithms: a systematic literature review on algorithmic accountability. In *Proceedings of the 2020 conference on fairness, accountability, and transparency* (pp. 1-18).

Wilson, C. (2022). Public engagement and AI: A values analysis of national strategies. *Government Information Quarterly, 39*(1), 101652. https://doi.org/10.1016/j.giq.2021.101652.

Wirtz, B. W., & Müller, W. M. (2019). An integrated artificial intelligence framework for public management. *Public Management Review, 21*(7), 1076-1100. https://doi.org/10.1080/14719037.2018.1549268.

Wirtz, B. W., Weyerer, J. C., & Sturm, B. J. (2020). The dark sides of artificial intelligence: An integrated AI governance framework for public administration. *International Journal of Public Administration, 43*(9), 818-829. https://doi.org/10.1080/01900692.2020.1749851.

Wylie, B. (2026, January 5). A digital infrastructure plan. *Canadian Centre for Policy Alternatives*. Retrieved from https://www.policyalternatives.ca/news-research/a-digital-infrastructure-plan/. Accessed April 19, 2026.

Yigitcanlar, T., Agdas, D., & Degirmenci, K. (2023). Artificial intelligence in local governments: perceptions of city managers on prospects, constraints and choices. *AI & SOCIETY, 38*(3), 1135-1150. https://doi.org/10.1007/s00146-022-01450-x.

Young, M., Ehsan, U., Singh, R., Tafesse, E., Gilman, M., Harrington, C., & Metcalf, J. (2024). Participation versus scale: Tensions in the practical demands on participatory AI. *First Monday, 29*(4). https://doi.org/10.5210/fm.v29i4.1364.