Does Artificial Intelligence Have a Place in Rural Governance? Navigating the Co-creation of Responsive Digital Technology Solutions in Rural Canada and Scotland

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Executive Summary

Governments in Canada, Scotland, and other jurisdictions continue to face challenges in developing rural policies that respond to diverse local realities while adapting to rapid technological change. Responding to current changes in the development of "artificial intelligence" (AI) has emerged as a significant policy priority due to the dynamic tension between potential applications to public administration, service delivery, and decision-making, and the social, economic, and environmental risks posed by rushed adoption. While the policy field concerned with AI is deeply contested, there has been little-to-no consideration, at the time of writing, to the ways that AI may impact rural communities. This is a pressing concern for policy, practice, and research alike, as differences in infrastructure, digital capacity, demographics, and economic conditions in different types of places indicate likely differences in the types of conversations required to meaningfully evaluate risks and opportunities. To address this gap, a Canadian–Scottish research team conducted what is, to our knowledge, the first comparative qualitative literature review of academic, research, and policy sources that specifically examines the relationship between AI, governance, and rural communities.

Limitation: *Given the rapid change in the technologies themselves, public attitudes towards the use of these technologies by both private and public sector actors, and increasing attention towards these matters, it is important to note that the completed review is time-limited and specific to that time. It is also geographically limited, including material specifically tied to either Canada or Scotland and the United Kingdom. These constraints were driven by both methodological and pragmatic requirements and are important considerations for reading the report that follows because the landscape of how AI is being approached in policy, practice, public discourse, and research is changing rapidly and remains far from settled.*

Material was collected between January 1, 2025 and September 30, 2025 and included only publicly available materials already in circulation (internal briefs, memos, etc.; any material not readily accessible through broad-based search engines was excluded). We

reviewed 187 pieces of material, with 91 sourced from Canada and 96 from the United Kingdom.

This high-level review suggests that governments have yet to consider the place-based implications of 'AI' and that a significant gap remains in transparent accounting of the evidence used to approach AI governance. Future policy development should place greater emphasis on accountability, transparency, public value, and community responsiveness, broadly speaking, while recognizing that rural communities require specific approaches tailored to their unique social, economic, and geographic contexts. More applied research is needed to better understand how AI may or may not support effective and equitable governance in rural settings and to ensure that emerging technologies contribute to the public good rather than exacerbating existing inequalities.

Critically, there is limited evidence available on the practical application of AI in rural governance. Much of the existing literature found in our review focuses on future possibilities rather than demonstrated outcomes, leaving important questions about accountability, public participation, informed consent, right to refuse/opt out, and community impacts unresolved. The review also found that rural voices and place-based considerations are largely missing from current AI governance strategies, despite substantial differences in community needs and capacities between rural and urban communities, and among different types of rural communities.

Summary of Key Findings

- ***There is no agreed-upon set of technologies that make up 'AI' in existing government approaches.*** Definitional confusion and the fluid context (social, political, economic) of policy agendas remain a significant stumbling block for policy considerations of AI. Current approaches emphasize quick, visible results (cost savings, efficiency or trendy tech), with a focus on innovation and economic growth, rather than long-term public good and rights-based framing.
- **Research and Policy needs to distinguish between governance *of* AI and governance *by* AI.** Existing literature frequently struggles to fully separate governance *of* AI (i.e., rules and regulations surrounding the proper use of AI, or

changes to the algorithm) and governance *by* AI (i.e., using AI to inform decision-making). Inflection points are emerging in the distinction between AI as tool that may support human-led work versus AI as a decision agent that largely replaces human-led work, raising questions about transparency and accountability in terms of what type of work is being targeted by AI technologies, by whom, at what cost, and to what ultimate goal.

- **In both Canada, Scotland and the United Kingdom, it remains difficult to assess who develops AI policy agendas, how, and why.** This appears due to fragmented responsibility, an increasingly blurry relationship between public-sector decision-making and private-sector influence, and sometimes conflicting jurisdictional approaches. Actors external to government appear to produce considerable influence over the development of AI governance strategies, both through being purposefully brought into institutional processes and through externally applied advocacy. This raises questions about who is accountable for the development, implementation, and outcomes or harms that may result from these policy agendas.
- **The literature identifies some beneficial use cases for specific AI applications**. The literature showcases some narrow-definition applications of AI, particularly machine learning and predictive analytics, in supporting large-scale analysis of data and providing evidence for data-based decision-making. Available literature points to early adoption of these tools in areas such as health, environmental management, agriculture and other increasingly data-heavy areas of public management. However, if the data used to develop AI-based governance tools are biased, incomplete or improperly managed, or drawn from a type of data-cannibalism where AI tools are digesting AI-generated data, the downstream impacts may be extremely damaging (e.g., in immigration and health care). AI systems mirror societal biases and, without careful attention, their use in sensitive policy portfolios may worsen inequalities for marginalized, rural, remote, northern and/or Indigenous populations.
- **Rural-specific realities of AI remain unexplored in the available literature in Canada, Scotland, and the United Kingdom.** These considerations – both risks

and opportunities – include a lack of digital capacity (including foundational infrastructure, data poverty, data deserts, and data divides), shortages of sufficient human capital with digital expertise and literacy, budget and other resource constraints, digital readiness and suitability of modernizing legacy systems.

- **AI does not yet capture the complexity of human interactions and considerations for place, voice and realities in different communities**. AI tools remain ineffective at understanding complex relationship dynamics, such as those that may show up in public consultations. There are limited mechanisms available for people or communities that would like to opt out of being subject to AI-based policies or decision-making. These strategies do not consider rural places and voices, ignoring significant differences in capacity, skill development, infrastructure, goals, and needs across community types.

Key Policy Implications

- **The devil is in the details:** Whether and how different bodies use AI (or any emerging technology) remains unclear. Policies around AI use by or in government have yet to clearly articulate existing and new regulatory measures, clear lines of accountability, options for redress or opting out, or community- and place-based responsiveness.
- **AI government strategies are first and foremost public policy for the public good.** Current approaches appear vulnerable to outsized influence from external actors, particularly private capital in the technology sector. Public institutions must be careful to prioritize good stewardship and alignment with the greatest public good by developing, evaluating, and applying evidence-informed use cases guided by principled regulatory oversight.
- **AI-based governance for rural with rural.** Assumptions about where, who, and what specific AI-based governance activities might be undertaken by public institutions should account for place-based and demographic diversity. This is particularly important in rural contexts, where geography, demography, and socioeconomic dynamics are strongly influenced by place-based variables.

1. Background: The Issue

Governments across jurisdictions continue to struggle to develop and implement robust, flexible, and effective rural policies that are capable of meeting the ever-changing realities and contexts of rural communities (see Merrell, 2021; Smith, 2010; Weeden & Kelly, 2021; Vodden et al., 2015). Rural places have often suffered from inappropriate applications of 'trickle down' economics and neoliberalist approaches to public policy with core/periphery binary thinking and urban bias, which has produced uneven development and inequitable outcomes (see Fors, 2018; Baker, 2019; Rodriguez-Pose, 2017; Weeden, 2020). As a result, rural places are often denied equitable opportunities to determine their socioeconomic futures due to retrenchment of disinvestment and capacity and resource challenges related to governance, planning, and economic development.

Emerging technologies, such as those grouped under the umbrella term 'Artificial Intelligence (AI)', are frequently promoted as offering opportunities to support capacity building and participatory forms of governance (see IFAD, 2024; MacKay, 2023). It is essential to understand if and how these promises translate into tangible outcomes, and how these outcomes may or may not work for rural communities. Further, it is critical that productive use-cases for emerging technologies are considered through a balanced lens that directs when and how they can be employed, with clearly defined rules for ensuring appropriate use (see Siebe et al., 2024). This is because emerging technologies pose considerable risks and ethical considerations, particularly in terms of democratic processes, individual and collective rights, equity and socioeconomic justice, infrastructure development and maintenance, and environmental impacts, among other concerns. For example, evidence is emerging that as AI programs grow, they are more likely to produce incorrect answers to queries rather than admit they cannot provide an answer (Zhou, et al., 2024; Hicks, et al., 2024), and that these programs are already producing racist and sexist material (Hofmann, 2025; Amnesty International, 2024). Growing concerns about the environmental impacts of the infrastructure required to support 'AI', and the outsize weight of these impacts on regions that are already vulnerable to climate change crises, have particular consequences for rural regions that may not be immediately understood or experienced by urban-based decision-makers.

Extending the consideration of these faults to the core/peripheral logic that is typical of many governance systems, it is plausible that, without a clear and commonly shared schema for ensuring appropriate oversight, these technologies could further reinforce uneven and inequitable development patterns in ways that serve to further deepen existing challenges and continue existing trends of exclusion and marginalization.

While there is growing interest, concern, and critical scholarship targeting the role of emerging technologies such as AI in governance and policy interventions, there appears to be very little exploration of the specific applications and intersections of such technologies in rural places and communities. Much of the extant literature, whether supportive or critical, is focused primarily on specific populations in an a-geographical context (i.e. removed from a physical geography and instead focused on demographic or shared status markers, such as disabled people, people of the global majority, women, etc.). Where there is less focus on specific demographic aspects, both academic and applied literature in this sphere demonstrate the same structural urbanism that is apparent throughout discussions about the intersection of technology and daily life. In response, we have based our scoping review on three themes that respond to the future challenges identified by the Social Sciences and Humanities Research Council of Canada: *Involvement and inclusion in governance structures, digital governance* and *systems of governance.* Below, we briefly outline the way our scoping review responds to these themes.

Involvement and Inclusion in Governance Structures: Our scoping review aimed to explore the opportunities and challenges presented by digital technologies for the transformation and greater openness of Canadian and Scottish governments. Of particular concern is the question of the implications for marginalized and/or rural and remote communities, including how the use of emerging technologies like AI affects the ability of communities and different orders of government to collaborate or interact with the public and its implications for government accountability and coherence. For example, rural people appear more likely to have their data harvested by AI programs – and that data is often used to support programs for urban areas (Guerra et al., 2019). Additionally, as Indigenous peoples and other historically equity-denied communities continue to develop critical concepts regarding data sovereignty and digital self-determination, a failure to approach the use of emerging technologies like AI in policy

interventions without strong guardrails and clear protocols for when it can and cannot be used may present critical barriers to reconciliation, collaborative governance, democratic processes, and human rights.

Digital Governance: Despite both policy and academic rhetoric suggesting urban areas are the loci of innovation (Florida, 2018), rural places can also be viewed as sources of innovation, particularly in developing new technologies (for example, GIS technology developed from largely agricultural mapping initiatives in rural Canada) (Shearmur, 2015). Despite this, rural regions are still often ignored or treated as an afterthought in technological policy decisions. Rural communities face the same governance challenges as larger communities, including increasing polarization, mis- and dis-information, and balancing the challenges of online harms against the opportunities offered by digital platforms. However, rural communities typically face these challenges already at a structural disadvantage, with fewer resources, lower quality digital infrastructure, sometimes lower digital literacy or capacity, and a diffuse population over a larger area (Mahroum *et al*, 2007). Technology may support greater access to information, but only if you have Internet access and the personal capacity to leverage that technology and assess the quality and applicability of information you do access. Similarly, tools like AI may allow public institutions to work more efficiently or economically, but there has been little evidence produced to date that demonstrates this to be the case and the adoption of new technologies requires administrative and political capacity, resources, and knowledge to be used effectively. When resources are already stretched thin, rural communities cannot afford to experiment with something that may not work or that comes with unknown extra costs. It is necessary to critically explore and understand the requirements and uses for these digital tools from a rural perspective, including whether these technologies perform in the way they promise, before rural communities can explore if and whether they may benefit from those tools. Finally, in an era of growing austerity and criticism for public spending, there serious risks to utilizing AI in the place of human capacity for making policy and programming decisions, including the reduction in overall human capacity in a community or using technology to justify disinvestment in human-led rural community capacity building. In rural regions where capacity is already stretched, there is the risk that the deployment of 'service-delivery-by-chat-bot' will only serve to further entrench disinvestment in rural and remote regions. As AI and similar tools are essentially in their prototype stage, rural-led or

rural-informed digital technology inclusion is essential for realizing any potential of these digital tools for governance in rural communities and avoiding perpetuating a vicious cycle of exclusion from data- and governance-inputs leading to increasing marginalization through their outputs.

Systems of Governance: As noted above, Indigenous researchers and policy practitioners have long led the way in offering alternative pathways to engaging with technology and governance, including developing critical concepts around data sovereignty, digital self-determination, and principles-driven governance. These concepts align with emerging work on "the right to be rural" (Foster & Jarman, 2022), which leverages a rights-based approach to rural policy interventions and development, rather than a sectoral or core/periphery approach. Democratic governance systems depend on rights-based approaches that balance individual versus collective rights. It is critical that any consideration of the use of emerging technologies like AI be viewed through a rights-based lens (Mitchell, 2023). Provisions for the right to refuse, the right to be forgotten (GDPR, n.d.), and the right to determine how and when individuals and communities wish to engage with these tools (and to stop if they change their minds) are critical for supporting appropriate use. As both Canada and Scotland appear to be moving towards more place-based policymaking, supporting communities' "right to be rural" by ensuring governance systems for the use of AI in community development and policymaking take a rights-based lens may help support those communities in having a stronger voice in the context of a broad range of issues (including infrastructure investment and management, service delivery, resource allocation, and environmental stewardship – all issues that directly intersect with technologies like AI). Local capacity is a critical issue for both Canada and Scotland, as local councils are faced with increasing pressure to deal with layers of poly-crisis, and there are both opportunities and risks presented by the potential use of AI and other emerging technologies to address these capacity challenges.

2. Objectives

The primary objective of this synthesis project was to develop a rigorous scoping review of the existing literature and policy evidence regarding either the current or planned use of AI in rural policy interventions, with specific consideration for the opportunities and risks AI technology

poses for capacity building, equitable outcomes, and the long-term socioeconomic sustainability of rural communities.

Scoping reviews systematically identify, clarify, map, and summarize key concepts related to evidence regarding a broad, exploratory topic. This approach is ideally suited to exploring a topic that is sparsely considered in both academic and applied literature, as it allows us to identify and highlight where key themes intersect and to point to connections between critical concepts in an important yet understudied area of research on governance and digital technologies.

Three initial research questions guided this objective:

- What is the scope and nature of current academic and policy literature addressing AI in rural governance and development?
- How are emerging technologies applied or proposed in public policy interventions in rural Canada and Scotland?
- What knowledge gaps remain regarding rural-specific considerations in AI-driven governance?

Comparative research between Canada and Scotland is facilitated firstly due to commonalities in similar rural policy contexts (see Weeden, 2022; Mahroum, et al, 2007). The countries share similar geographic and demographic dynamics (although at differing scales) that pose comparable challenges for addressing critical socio-economic policy issues in rural places, including infrastructure, digital capacity, education, service delivery, and economic change. Canada and the United Kingdom share a Westminster government structure and are both 'middle powers' that do not influence technological development to the same degree as the United States or China, but that are still capable of strategic global influence.

3. Methods

This study used a qualitative literature review methodology, conducting systematic searches of academic, research, and policy literature from Canada and Scotland. Grey literature included blog posts, news articles, policy documents, toolkits, a freedom of information response, and an independently commissioned report. Academic literature was sourced from a wide array of

journals in health, governance, digital policy, data and society, and cybersecurity, among other fields. All resources used were published after Januaryy 1st, 2015 and prior to September 2025. Searches were conducted concurrently and supplemented through snowball sampling techniques to identify additional relevant sources and influential works (Cranfield University Library Services, n.d.). The search protocols used for this review are included in Appendix [A]. Data were extracted and analyzed to identify key concepts, themes, relationships, and gaps across the literature sourced. Coding was completed by individual coders, one for Canada and one for Scotland/United Kingdom.

Figure [1] outlines the subtypes/classifications of literature by case location, while Figure [2] provides the timeline of materials by location. While the review covered a 10-year period, Figure [2] illustrates that this is a rapidly emerging literature field, as nearly half of the materials reviewed, 45% (84), were published in the last 3 years of the study. This is further heightened by the fact that the final year of the study, 2025, did not include a full year of publications but still provided one of the largest groups of materials for the review.

SEARCH & SELECTION CRITERIA

Academic Databases: Scopus, Web of Science, ProQuest, EBSCOhost, JSTOR, IEEE Explore, Institue of Education Sciences
Grey Literature Sources: Google Scholar, Government websites, Newspapers

Inclusion Criteria:

- Sources in English
- Studies/Reports focused on Canada/Scotland/UK
- Topics covering rural governance, rural development, AI, digital governance or digital capacity

Exclusion Criteria:

- Studies unrelated to rural or regional governance
- Literature focused solely on urban/suburban contexts
- Non-English language materials

Search Time Frame: Jan 1, 2015 - Sep 30, 2025

FINAL NUMBER & TYPE OF SELECTED MATERIALS

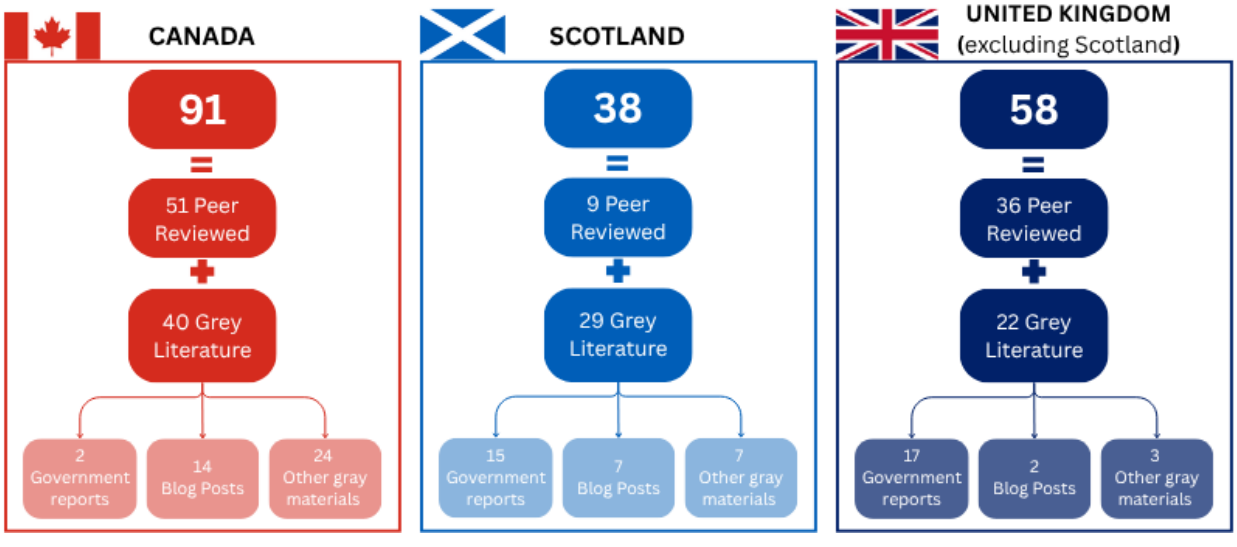


Figure 1 Litearture Review breakdown

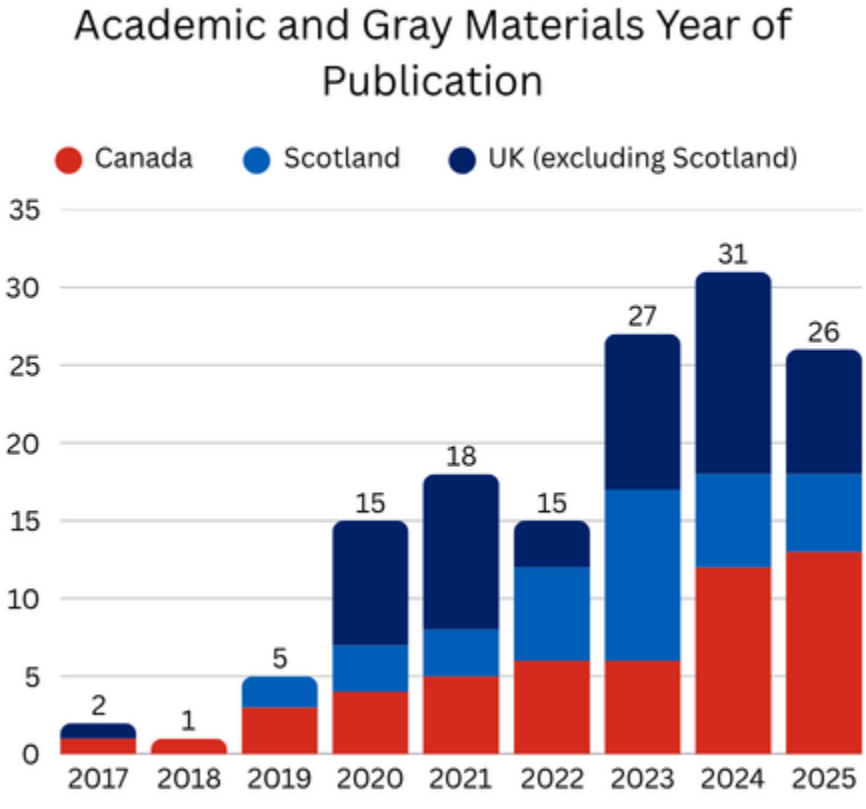


Figure 2 Materials by type and location over time

Inclusion/Exclusion of Literature

For the United Kingdom and Scotland, we identified 133 pieces of literature, of which 96 were included in the review. Of the materials included in the United Kingdom review, 58 were sourced from areas in the United Kingdom excluding Scotland, and 38 were sourced specifically for Scotland. For Canada, we initially identified 128 journal articles and 95 grey literature sources, and selected 51 journal articles and 40 grey literature sources for the review.

Literature was excluded for the following reasons:

- Many publications focused on AI in general terms or emphasized theoretical and technical aspects without addressing rural contexts, public policy, or governance, and were therefore deemed not relevant to the review's objectives.

- Some sources discussed AI, machine learning, and blockchain purely as technical innovations, without considering policy implications, governance systems, social impacts, or community-level effects.
- Several publications were excluded due to their geographical focus, such as studies jurisdictions outside of the case-locations used for this review, which did not provide insights applicable to the Canadian or Scottish contexts examined in this review.

4. Results

Limitations

The main difficulty in conducting research in this area is the constant, rapid pace of change. This work is rooted in the complex interplay of both politics and technology, both of which are deeply intertwined and subject to outside pressures and influences. Individually, each of these fields is large and complex, but more critically, they are in constant flux. Since policy development lags innovation, a gap exists, leading to a sense of chasing the answers.

Complicating this process is the lack of a precise and common language. One of the main findings of the review was that the term 'Artificial Intelligence' was "interpreted differently, and with different strategic goals, depending on the social, political, economic, and organizational contexts in which it is perceived" (Attard-Frost & Lyons, 2025. p.2557). The umbrella term "AI" is used interchangeably in the governance literature, and there is no agreed-upon set of technologies that make up AI in existing government approaches. Broadly, however, most of the literature referred to Generative AI/Large Language Models or Machine Learning/Neural Networks.

Finally, as emphasized earlier in this report, this review is both time-specific/limited and jurisdictionally specific/limited. While data collection was completed only weeks before the finalizing of analysis, public discourse on the use of AI by public institutions had evolved significantly and new policy agendas were being released or updated by different governments around the world. The rapid pace of change in the field, as well as the rapid changes in broader public responses to technology, create challenges for supporting real-time analysis and policy

recommendations. The development and deployment of AI are occurring rapidly, often outpacing the policies, rules and regulations of governments that aim to safeguard citizens, businesses, and national interests.

4.1. Governance – Key Distinctions and Current Policy

4.1.1. Key Distinctions

A useful means of analyzing the literature is a two-fold category: governance ***of*** AI (i.e., rules and regulations surrounding the proper use of AI, or changes to the algorithm) and governance ***by*** AI (i.e., using AI to inform decision-making). The existing literature and policy frequently struggle to fully separate these two categories. Below, we provide our approach to differentiating between these blurry concepts.

Following our two-fold categorization, the following definition points to governance ***of*** AI:

> "AI governance is a system of rules, practices, processes, and technological tools that are employed to ensure an organization's use of AI technologies aligns with the organization's strategies, objectives, and values; fulfills legal requirements; and meets principles of ethical AI followed by the organization" (Attard-Frost & Lyons, 2025. p.2558).

This definition is useful because it shows that AI governance must incorporate ethics, transparency, risk management, and public accountability, not just technical standards. Other best practice literature points to how governance ***of*** AI should be robust, clearly structured across the full AI lifecycle, and involve multidisciplinary collaboration that breaks down organizational silos and ensures shared responsibility for ethical and legal compliance (Torrie & Payette, 2020).

Reinforcing our two-fold category, inflection points are emerging in the distinction between AI as an enabling tool versus AI as a decision agent (i.e. governance ***by*** AI), raising questions about transparency and accountability:

> "There is an ill-defined inflection point where algorithms used to support decision making become decision agents in and of themselves, and that lack of clarity risks

> moving public decision makers from one category (where the algorithm is a tool to support the decision maker) into another (where the algorithm makes the decision, and the human decision maker merely communicates it) without us fully grappling with the shift." (Longo, 2022, p.3-4)

4.1.2. Current Policy (Canada, Scotland and UK)

The UK Government initially published the National AI Strategy in 2021 – this is largely a document about how the UK can become a global leader in the development and implementation of AI (i.e. investment into AI), some economic sectors that may benefit from AI, and a section on the governance *of* AI. The UK has taken a sector-based approach to AI governance, with the stance that cross-sectoral rules and regulations would be too restrictive for the different approaches and applications in these different sectors. However, there is critique of this approach in the strategy, and, in 2021, the UK Government was considering its options when pursuing this approach:

> "Having embraced a strong sector-based approach to date, now is the time to decide whether our existing approach remains the right one." (UK Gov, 2026. p.51)

The UK's subsequent AI Opportunities Action Plan was included in the scoping literature review as it was released before the reviews' end date of September 2025. In January 2025, the UK Government published the AI Opportunities Action Plan, developed by technology entrepreneur Matt Clifford (Clifford, 2025). The government subsequently committed to taking forward all 50 recommendations (Department for Science, Innovation and Technology [DSIT] & Prime Minister's Office, 10 Downing Street, 2025). The report's considerable influence raises questions about how national AI policy development represents competing perspectives, particularly those of rural communities and other groups potentially affected by AI deployment. Although the government reports consulting stakeholders from industry, academia, and civil society, the extent to which rural and place-based governance concerns informed the resulting recommendations warrants further examination.

The Scottish Government published Scotland's Artificial Intelligence Strategy 2026–2031 in March 2026, building on its earlier 2021 strategy. The new strategy commits to responsible AI governance, particularly by aligning with the OECD's AI Principles and developing appropriate

regulatory safeguards (Scottish Government, 2026, pp. 47–49). However, questions remain about how these national commitments will translate into place-based governance arrangements that respond to the distinct needs and capacities of rural communities. This strategy was guided by the AI Sub-group of Scottish Technology consisting of four technology sector leaders and two academic experts in machine learning and human data interaction (Scottish Government, 2026, p. 54).

Compared with the predominantly sectoral approach of the UK strategy, Scotland's strategy gives more explicit consideration to geography and regional differences. For example, it identifies inclusive AI literacy as an outcome intended to address inequalities associated with income, geography, and other forms of digital exclusion:

> "Inclusive AI literacy – People of all ages, backgrounds and locations know how to engage with AI which will address gaps linked to income, geography or other forms of digital exclusion." (Scottish Government, 2026. p.23)

Rural areas are also explicitly recognized in relation to emerging AI applications in the Highlands and targeted support for rural businesses accessing AI adoption programmes (Scottish Government, 2026, pp. 7, 26). Nevertheless, these references primarily concern economic development, skills, and access to technology rather than the specific challenges of rural governance, democratic participation, or community control over AI systems.

Scotland's Artificial Intelligence Strategy 2026–2031 also commits to advocating for UK legislation that would give the OECD's five values-based AI principles statutory standing, while exploring additional safeguards within Scotland's devolved responsibilities (Scottish Government, 2026, p. 49). However, these proposed regulatory measures do not, in themselves, establish mechanisms for rural communities to exercise meaningful authority over the selection, deployment, or governance of AI systems that affect them.

Governance ***of*** AI in Canada is evolving rapidly, with strong policy foundations and political will, yet it is somewhat fragmented and there remains significant gaps in enforcement, transparency, and accountability. In 2021, the governance *of* AI (as well as investment into AI technologies and initial policy) was primarily focused on the federal level:

> "A lot of work on AI policy can be found at the federal level. The majority of AI policy is centralized within the Treasury Board of Canada Secretariat (TBS). Among its many roles, the TBS provides leadership to digital government, open government, open data and AI" (Brandusescu, 2021. p.17)

However, more recently initiatives are being developed across the federal and provincial governments:

> "Canada was the first nation to implement a national AI strategy, and more recently, Canada's federal and provincial governments have designed and implemented a wide range of initiatives that attempt to intervene in a variety of potential impacts associated with AI systems" (Attard-Frost *et al*, 2024. p.1)

Like both the UK and Scotland, Canada recently updated its AI policy, launching Canada's National Artificial Intelligence Strategy: AI for All in June of 2026. The updated strategy emphasizes building a foundation of trust in AI that will lead to high adoption of the technology and, in turn, prosperity and sovereignty for Canada (Government of Canada, 2026, p. 6). Canada's strategy highlights the importance of building both trust and adoption of AI across sectors and society, and that targeted supports are needed to build a Canadian AI ecosystem that develops local champions, data, and talent (Government of Canada, 2026, p. 7). The Canadian government's 2026 AI strategy was shaped by the AI Strategy Task Force consisting of 28 sector, academic and institutional technology leaders, organized across themes related to research and talent, adoption across industry and governments, commercialization, scaling champions and attracting investment, building safe AI systems and public trust, education and skills, infrastructure, and security. The strategy also drew on more than 11,000 public submissions from national consultations.

Rural areas are mentioned in the Canadian strategy as part of building AI literacy across Canada, with a specific reference to rural, remote and northern regions of the country (Government of Canada, 2006, pg. 19). Similar to the Scottish Government strategy, though, the emphasis on place-based engagement and differentiation is only focused on the need for adoption and literacy in these places, and does not address the unique, place-based realities of digital technologies and governance in these rural, remote and northern regions.

Canada's AI strategy does provide a more robust understanding of demographic inclusion and differences, however. Gender-based analysis for policy design and governance and accessible AI are both put forward as key actions to ensure that AI embodies Canadian identity and culture (Government of Canada, 2026, p. 24). The strategy also prioritizes Indigenous engagement and leadership in developing AI capacity, applications, tools, and approaches that recognize and protect Indigenous self-determination (Government of Canada, 2026, p. 23). While the Canadian AI strategy focuses primarily on adoption, it recognizes the need for diverse demographic inputs and considerations around AI participation, design, and implementation, and further states the need for Indigenous control of AI systems and implementations in their communities.

Safety and public trust in regard to AI encompass the first and last of six pillars in Canada's strategy, occupying a third of the strategic priorities and actions (Government of Canada, 2026, p. 7). This strategy seems to recognize that public concerns about AI are increasing, and that policy and action are required to address them. 'Trust', 'Safety' and 'Protect' are repeated regularly throughout the strategy and highlights key actions such as safeguarding personal data, protecting against harm from AI-enabled misinformation, the creation of a Canada Trusted AI Certification program and championing global open-source AI development in the public interest (Government of Canada, 2026, pgs. 15, 16, & 48).

4.2. Opportunities

In both Canada and Scotland, rural-specific opportunities, challenges and use-cases for the use of AI in governance remain unexplored. However, the literature did point to the potentital opportunities for using different types of AI to help solve some pertinent issues in rural areas, specifically in health care support and Local/Municipal Government service deliver,, or, where certain sectors/industries are dominant (e.g. agriculture, forestry, and other environmental management activities).

4.2.1. AI to support overcoming persistent rural challenges

Rural communities encounter many challenges to service delivery, including structural and systemic marginalization, and uneven access to human, financial, and digital capital. This is

largely due to a 'rural premium' of delivery – i.e. it costs more to deliver rural services due to sparse populations and larger distances involved between population bases. One prime example of this is healthcare, where rural-based healthcare practices appear to be moving ever-increasingly to online or remote access provision of services. Whether this is happening by choice or by force remains unclear.

AI may offer potential for supporting rural healthcare provision. In Canada, a Canadian-made AI-powered "virtual clinic" is currently operational and could now help improve access in rural, remote, and Indigenous communities (Silcoff, 2025). These interventions may support increasing accessibility through remote access and reducing costs (Maleki Varnosfaderani & Forouzanfar, 2024) by performing diagnostics, clinical decision-support, and identifying Social Determinants of Health through machine learning, as Khan *et al* (2025, p.1) explain:

> "AI technologies, particularly in virtual care platforms, hold promise for managing these conditions and bridging healthcare gaps. However, applying a uniform approach to these communities fails to consider the diverse demographic and clinical needs that shape healthcare requirements. A systematic, community-tailored framework is essential for creating effective, AI-driven healthcare solutions in these settings."

Although seen as a potentially huge opportunity for the future of healthcare provision in rural areas, Khan *et al* still provide a warning that is echoed elsewhere in the literature; that a one-size-fits-all approach (especially for rural areas) is unwise, and instead a bottom-up community driven approach (especially in the early stages of development) could prove more fruitful. Talking specifically about the use of AI in healthcare in northern Ontario, Zhang *et al* (2025)

> "Participants had concerns about readiness, infrastructure, resourcing, cultural competence, language availability, workforce education, and the importance of local community representation during AI development" - and that - "healthcare AI must be contextualised, guided by equity considerations and shaped by the actual experiences of rural practitioners" (p.1)

Similarly, local governments and councils exploring AI solutions for local-level governance face questions about the applicability of these technologies to their specific community contexts. This scale is particularly important for rural areas, as some local governments and councils have majority rural areas in their jurisdiction, while others may be balancing rural and urban places within their boundaries. In both Canada and the UK, several decades of economic austerity have significantly affected public institutions, and local council budgets have been consistently reduced, or the responsibility for services has been downloaded by other orders of government without matching resources, and therefore local public sector delivery of services have steadily decreased.

The literature does point to the potential for AI solutions to help overcome some of these challenges or deficiencies. For example, AI may offer opportunities to modernize public services, optimize workflows, automate administrative tasks, and strengthen data-driven decision-making:

> "AI has the potential to modernize public services, improve administrative efficiency, and strengthen data-driven decision-making. By exploring the real-world applications and implications of AI, public administration professionals can anticipate challenges, seize opportunities, and ensure ethical and effective implementation of this innovative technology." (David, 2024. p. 389")

AI solutions are indeed being implemented at the Municipal level in Canada, with some early research and analysis done on these activities:

> "Local governments are meeting these external demands with AI-powered chatbots, self-service portals, and mobile apps. These tools empower citizens to book appointments, report issues, and get answers to common questions on their own schedule, leading to improved customer satisfaction, stronger community engagement, and more personalized public services." (MNP, 2025)

One example of chatbots being deployed came from Selkirk, Manitoba:

> "The service offers 24/7 chats for information on the city's website and mobile app. The app also generates service tickets on behalf of citizens during chat sessions, if required. January saw the launch of Charlotte [whose] task is to answer phones

> when [workers] are busy with other callers, or after regular business hours" (Baxter, 2025)

Local governments and councils house planning departments which are responsible for making decisions about future developments. AI can provide predictive analytics which can support proactive planning decisions in municipalities:

> "Predictive analytics is being used to anticipate future needs and challenges. This includes forecasting demand for services, predicting maintenance needs for infrastructure, and identifying trends in community well-being. By leveraging predictive models, municipalities can proactively address issues and allocate resources more effectively." (MNP, 2025. p.21)

However, significant caution must be applied to these suggestions in the literature, as these things remain largely promises or ideas at this time, with very little documented evidence available to demonstrate tangible outcomes. Further, much of the language used to identify potential 'positive' use-cases for AI by local governments use neoliberal tropes that rely on the assumption that the only measures that matter is a financial return on investment, driving down costs of service delivery, and efficiency, neglecting considerations of effectiveness, individual or community choice, social costs of replacing human interaction with technological interfaces, and the role of public institutions as employers and stabilizers in many communities. There is a risk of a 'race to the bottom' that may end up without a 'human in the loop' and greater alienation of people from the governments that are intended to serve their needs.

4.2.2. AI to support rural economies

Agriculture is a large and critical sector of the rural economy in Canada, Scotland and indeed most rural areas globally. Agriculture has always been a knowledge-intensive sector, and this has increased exponentially with the advancement of equipment, the expansion of farm operations, and the intensification of production. The introduction of AI is bringing change and opportunity to the agricultural sector:

> (AI) represents a paradigm shift in how farmers cultivate crops, manage livestock, and optimize land use … enabl[ing] farmers to make data-driven decisions, optimize resource utilization, and enhance productivity while minimizing environmental impact" (Salehi, 2024. p.71-76).

AI can also be used to monitor weather patterns and analyse (increasingly) large data sets around crop productivity and soil conditions to help inform farmers. These applications raise important considerations about the use of AI tools to address non-human data, such as soil conditions or weather conditions, versus AI tools that are used to influence human decisions and behaviour. While both of these applications carry inherent social, political, economic, and environmental opportunities and challenges, existing literature reviewed for this report often fails to consider or adequately address the nuance and complexity of AI use in a particular sector, let alone on a broad scale.

As with the agricultural sector, rural areas have a disproportionate amount of Small and Medium Enterprises (SMEs) – businesses with fewer than 250 employees – and microbusinesses that employ less than 10 members of staff. For example, roughly 18% of all SMEs in Canada are in rural areas, employing roughly 2.4 million people. In Scotland, the figures are even more stark, with 27% of all SMEs operating in rural areas, employing almost two-thirds of the workforce. The current literature suggests that there may be disproportionate (short to medium-term) growth potential for smaller businesses to adopt AI solutions compared to larger businesses. This therefore is particularly relevant to rural areas:

> "These technologies enable SMEs to automate processes, optimize decision-making, enhance customer interactions, and drive innovation, thus improving their overall competitiveness and efficiency … AI can enhance sales forecasting, streamline inventory management, personalize customer interactions, and optimize processes to drive operational efficiency" (Le Dinh *et al*, 2025. p.7-13)

In Canada, AI-powered data dashboards or helping rural SMEs in their decision-making and "furthermore, AI enhances risk management and compliance by promoting ethical, secure, and transparent deployment practices, addressing issues such as data privacy, algorithmic bias, regulatory compliance, and explainability" (Daly, 2023. p.14). Again, however, this

practice is new, contested, and complex, and more data is required to establish credibility for such claims.

4.3. Challenges

4.3.1. Authority and Accountability

As referenced earlier, public organizations are actively onboarding AI solutions to aid with governance and decision-making, at speed and scale, and with seemingly sudden urgency. This has been witnessed at the National (Scotland)/Federal (Canada) level, as well as Municipal (Canada) and local levels. However, these actions have faced criticism or concern from various parties, including in the academic and gray literature.

For example, many government AI strategies focus on innovation and economic growth, ignoring social implications (Brandusescu, 2021). This echoes earlier critiques of growth policies as spatially blind, particularly innovation strategies often criticized for adopting one-size-fits-all approaches. “There is a missing public advocacy voice in the AI discourse” (Brandusescu, 2021. p.39); this review highlights that rural voices, in particular, are missing from these discussions.

While there is apparently a dearth of engagement and consultation with the broader public, it appears that specific actors that are to government may be exerting considerable influence over the development of AI governance strategies. These actors appear to largely come from private capital and technology firms, raising questions about who is accountable for harms or outcomes:

> “Despite the massive expansion of government contracts for AI systems, little attention has been given to the questions of whether private vendors of these technologies should be legally accountable for the harms produced when governments use their systems” (Crawford 2021: 198–199)

While it is impossible to draw direct causal lines between this dynamic and the types of AI policy agendas being developed, our review found that existing literature and policies appear to emphasize quick, visible results like saving money, increasing efficiency, or adopting trendy technologies; such narratives appear to mimic private sector language and practices, rather

than long-term stewardship of public good, ethics, or structural reforms that are more typically the priorities of public institutions:

> "Like most other policies related to digital governance and technology integration, Canada's AI policy centered on short-term benefits, contributed to an externalization of government services, and catalyzed a broader politicization of the Canadian civil service." (Lepage-Richer & McKelvey, 2022. p.9)

Quickly implementing solutions which have unclear accountability pathways raise the risk of losing the trust of the general population when it comes to governmental decision-making. Additionally, using big government data for AI may be helpful, but it also risks people being tracked, watched or having their private information misused (Brandusescu & Sieber, 2025). Further, large, centralized government agencies have long struggled to collect and analyze data that is granular enough to meaningfully understand rural regions, resulting in rural places being pulled in by the gravitational weight of their urban neighbours; if that data were to be specific enough to be applicable to a given rural region, it is very likely that it would not be possible to aggregate or anonymize that data enough to protect individual privacy and other rights. The long-tail implications of the data ecosystems used by different governments must be carefully attended to in order to meaningfully inform people and communities about how their information is being used, their rights in directing that use, and whether those uses result in a net benefit to people and communities.

4.3.2. The 'Garbage in, garbage out' issue

'Garbage in, garbage out' – sometimes referred to as GIGO – is a principle from computer programming and mathematics that underlines the direct connection between the quality of inputs and the quality of outputs from any analytical undertaking. The concept itself is precisely as it sounds: if you put poor-quality data into any process, equation, or tool, you will get poor-quality analyses, results, or outputs.

If the data used to develop AI-based governance tools are biased, incomplete or improperly managed, the downstream impacts can be extremely damaging. The treatment of rural areas in previous eras of economic and innovation policies as peripheral to the urban core may be

brought forward into the (potential) bias of AI decision-making. Training data and programmer assumptions worsen inequalities for marginalized and rural populations:

> "Access inequalities in remote communities reinforce one another in different ways than in urban communities. For example, remote communities have limited access to large schools and hospitals, while many urban residents have a lower need and appreciation for teleservices because they can choose to access those services in person" (McMahon *et al*, 2021. p. 5231-5232)

Existing literature consistently emphasizes that AI systems mirror existing societal biases; when technological tools are developed, they cannot be de-contextualized from the environment in which they were created. As a result, programming that is developed using poor quality or biased data and assumptions may worsen inequalities for marginalized, rural, remote, (and in Canada) northern and/or Indigenous populations. While new voices and perspectives are emerging from historically marginalized communities and scholars on this issue, current AI systems largely reflect Western individualistic frameworks, which do not align with many Indigenous worldviews that are often embedded in community, reciprocity, and relationality (Khan *et al*, 2025).

4.3.3. Rural-specific challenges

In addition to considerations regarding the 'garbage in, garbage out' issue that may result in algorithmically disadvantaging rural areas, there are also structural issues that could hamper the ability or effectiveness of these places implementing AI solutions. For example, the literature considered in this review fails to consider the different digital capacities experienced by rural municipalities who may face shortages of expertise, budget constraints, digital readiness and difficulties modernizing legacy systems:

> "Many local governments are eager to harness the potential of AI, but modernizing systems and associated policies, practices, and procedures is not that easy. Not to mention, it can be a costly undertaking for tight budgets. Our survey asked leaders what they anticipated their top technology challenges to be. The top four stood out above the rest: cyber security and privacy (73%), protecting data (57%), replacing

existing legacy systems (49%), and determining the appropriate use of AI (47%)." (MNP, 2025)

Additionally, some rural areas may have a complete lack of data to even train the AI on, risking potential solutions from elsewhere being applied in inappropriate ways. Communities with little to no data run the risk of being left behind (further) or misrepresented:

> "Research has found that regions experiencing data poverty, data deserts and data divides fail to benefit from technological innovations that foster data growth and access." (Brandusescu & Sieber, 2025. p.4)

As noted throughout this report, the literature considered in our scoping review struggled to address, let along incorporate, spatial and place-based dynamics and tended to flatten entire jurisdictions into a single entity. While this challenge is not specific or limited to AI policy agendas, but applies broadly to contemporary policy making, it is important to note that the literature available at the time of this review failed to consider any type of place-based differences, rural or urban alike, and tended to favor industrial or sectoral approaches with no geographical consideration of where those activities take places and the relationship between those activities and the communities where they are located. As discussed in 4.1.2, new AI strategies in Canada, the United Kingdom and Scotland do not yet sufficiently address or incorporate place-based realities and rural areas so this remains an ongoing challenge for AI in each of these jurisdictions.

4.4. Gaps in Literature and Policy

The development of AI tools is still somewhat in its infancy. This is even more pronounced when it comes to governance *by* AI, which for now is largely a future promise of AI companies or with very limited real-life application. Therefore, there are still significant gaps remain in the literature, and two critical ones need to be addressed in the context of this reviews findings and research.

There is a general lack of research on how AI is or will be deployed in rural areas, let alone how effective it is as a governance tool – within rural areas or compared against urban areas. For

now, the discussion around the deployment of governance *by* AI (in rural areas) is largely hypothetical and theoretical – with the academic literature addressing ethical concerns.

4.4.1 Effectiveness of governance *by* AI

One gap in our understanding is how effective AI tools are when deployed to support governance. For example, AI tools appear ineffective at understanding complex relationship dynamics, such as those that may show up in public consultations:

> "There remains a gap between the AI tools we have today and their practical application and abilities … [to] perform reliable analysis of citizen contributions" (Boyco & Robinson, 2024. p.9)

Human opinions, emotions, concerns, and ideas are often messy, unclear, or expressed in many different ways. This is already an issue for AI, but further adding to this issue some models are "prone to so-called hallucinations and offering inaccurate responses in a highly confident tone" (Boyco & Robinson, 2024. p.9). Similarly, there is still a lack of clarity on how decisions are made by AI systems, for example the Chinook immigration processing tool in Longo's (2022) study. These concerns about the quality of decisions and rationales being used by AI raises concerns about how that will impact givernance by these same tools.

Additionally, critical gaps remain in determining how effectively AI is implemented or evaluated beyond pure technocratic considerations. Current federal monitoring tools focus on job creation and investment, not social consequences such as equity, labour displacement, or public trust. Much of the focus in all three countries in terms of AI strategies and invesment is on job creation, trade, and investments in private entities (Government of Canada, 2026, Sottish Government, 2026, UK government, 2025). In previous analysis of Canada's AI funding, 70% of the $1 billion of federal contributions were awarded to the AI industry private sector (Brandusescu, 2021: 10).

4.4.2 The practical realities of governance *by* AI

Failing to consider and include the voices and concerns of places in AI strategies results in policy agendas that ignore the significant realities of the goals, aspirations, needs, and capacities of different types of places. Much of the literature considered for this scoping review implies that all communities should and do want to adopt AI technologies immediately

and for the same reasons or outcomes. The new AI strategies outlined in 4.1.2 also assume that all places want AI and will use it similarly.

On one hand, there are limited mechanisms available for people or communities that would like to opt out of being subject to AI-based policies or decision-making. Such assumptions have not been meaningfully tested and do not reflect differences in capacity, skill development, infrastructure, goals and needs across different types of communities, let alone value-based reasons for either adopting or rejecting AI technologies based on social, cultural, or environmental factors.

Additionally, the capacity to implement AI across all levels of government in all places has not been addressed in the literature or in policy. In a study of local governments in Canada, 32% had no formal policies or guidelines for implementing AI governance, with 63% citing a lack of expertise in this area (MNP, 2025). In this new era of AI, the digital divide between urban and rural areas looks likely to expand due to these structural issues and is a large gap that needs addressing. The challenge of providing clear transparency on how AI is being considered, adopted, or applied by governments as entities versus by people who work within governments was also not addressed by the literature considered in our review. Similarly, the use of AI by the public sector versus private sector is not meaningfully addressed in the available literature. Canada appears to have strong rules and oversight for AI used inside the public sector, despite limited transparency about how individual use by staff within government is monitored and regulated, but almost no equivalent regulations for AI used in the private sector:

> "While Canada has shown international leadership on regulating automation inside the government, we lack policies for private-sector AI. Ensuring that AI regulations are in place won't slow the industry. Instead, they set boundaries and goal posts that point businesses in a direction where they can find success and promote social benefits over the longer term" (Pasek at al., 2025).

4.4.3 How to ensure inclusion in AI development

Beyond misinterpretation of people's opinions (regardless of who they are), some voices are being excluded entirely, which is a significant gap in our understanding and a growing concern for rural areas and Indigenous Communities:

> "Indigenous data sovereignty is crucial for resisting digital colonialism and technological determinism in AI development. By centring Indigenous rights and perspectives, tech companies can build more equitable, inclusive, and sustainable AI systems." (Rana, 2024. p.639)

While some literature has argued that AI may help strengthen data sovereignty, support Nation-building, cultural preservation, and ecological stewardship, these opportunities may only materialized if AI aligns with Indigenous rights and values. In their current iterations, most AI policy agendas are offering solutions for capacity gaps while simultaneously risking deeper digital and colonial divides:

> "AI systems are built on Western frameworks that do not necessarily reflect or serve Indigenous community needs. These systems continue the erasure of Indigenous knowledge, values, and governance models, reinforcing the urgency for an approach to AI that is ethical and grounded in Indigenous rights. AI can be a powerful tool for self-determination, economic growth, and cultural preservation. By taking the lead in AI adoption, First Nations can harness its potential rather than be left to navigate systems built without us." (First Nations Technology Council, 2025).

The Canadian Government's new AI strategy, AI for All, released in June 2026, acknowledges the needs of diverse groups, including key actions and sections focused on Indigenous leadership in AI, respect for the French language, and accessibility and gender-based realities.

> "Canadian AI must support, reflect, and project Canadian culture, which includes our customs, our history, and our heritage. Canadian voices, languages, communities, and knowledge must also be represented in how AI systems are designed, built, and used. Given our diverse and multicultural society, our approach to AI must acknowledge and support this rich diversity, including strengthening the

French language by capturing and projecting its idioms, expressions, and cultural contexts." Government of Canada, 2006, pg. 24).

However, the Canadian AI strategy does not address the practical realities of rolling out AI adoption across these different groups and places, nor do the UK and Scotland AI strategies. The implementation of governance *by* AI in rural places and among different groups, cultures and cohorts remains a significant gap that needs to be focused on and better understood.

5. Implications

This scoping review has identified key themes in the interplay between the development of AI policy agendas and their application to rural regions. Unfortunately, the opportunities identified in the literature are largely 'vaporware' at the present time, meaning they are largely promises without evidence to support any claims for use cases in deploying AI in service delivery in rural areas. Rural regions remain either completely ignored or only considered in passing by existing policy agendas in Canada and the United Kingdom and Scotland. It follows, then, that the messages emerging from the academic and gray literature caution and express concern about AI adoption within governance systems, especially in the limited literature specific to rural governance.

Implications for Research

- **More evidence-based research on AI governance is needed to inform policy and decision-making.** More research is required due to the lack of robust, applied use-case examples to support evidence-informed decision-making for both governance *of* AI and governance *by* AI. Existing literature largely focuses on the promises of AI, rather than the results of its real-world application in policymaking, with significant gaps in rural-based uses. This is further complicated by rapid changes in capacity and the widespread use of AI-based technology compared with the time needed to appropriately study and evaluate the outputs and impacts of specific use cases.
- **AI research findings and recommendations need to be communicated to all levels of government.** Research on the 'governance *of* AI' is complex and ongoing due to the cross-border nature of digital technology, regulated by the geographically and politically bounded nature of legal jurisdiction. Research on the effects of 'governance *by* AI' will likely occur *ex post* (after the event); therefore, the important issues facing rural areas raised in this review need to be advocated in current public discussion and to decision-makers at the national, regional/municipal and local levels of government.
- **More research on digital divides, including an AI digital divide is needed to not repeat past digital technology mistakes.** There has been prior research on the effects of the (growing) digital divide between rural and urban areas, and the warnings in this body of

work should be taken into account as we enter the era of AI. It is unclear that, despite the hype, AI may not solve these problems, but in some circumstances, exacerbate the divides, since many of the fundamental problems identified in past research remain unsolved (connectivity, literacy, privacy).

- **The origins and drivers of AI policy and strategies need to be clearly examined and communicated.** Current approaches appear vulnerable to outsize influence from external actors, particularly private capital in the technology sector. Public institutions must be careful to prioritize good stewardship and alignment with the greatest public good by developing, evaluating, and applying evidence-informed use cases guided by principled regulatory oversight.

Implications for Policy and Practice

- **Current AI policy is prioritizing economic outcomes without sufficient social or place considerations.** A recurring theme throughout the literature and policy is that current AI policy approaches in both Canada and the UK/Scotland are heavily oriented toward economic growth, innovation and efficiency gains. This focus masks issues around equity, accountability, and long-term public value. The tension is particularly clear in rural governance and development, which must navigate ongoing systemic inequalities and the steady decline of essential public services. Therefore, future policy approaches (especially in rural areas) should instead be framed with a public-interest approach. AI systems, in general, should be evaluated on their impacts on equity and inclusion, and how participatory/transparent they are. In addition, if governance *by* AI is to be implemented, then AI systems should also require 'rural proofing' (Atterton, 2008, Hall & Gibson, 2016), including, but not exclusively: effects on rural service accessibility; implications for labour displacement and local capacity; Indigenous rights, data sovereignty and community consent.
- **Place-based inclusion is needed for effective AI in rural and other non-urban areas.** Moving past 'rural proofing', the goal should be to design proactive AI governance frameworks that center rural, northern and remote communities, rather than treating them as afterthoughts in urban-focused tech policies. New AI strategies across Canada, the United Kingdom, and Scotland exclude the importance and realities of non-urban areas. AI

systems should be co-produced with a diverse mix of stakeholders from rural, remote and northern areas alongside urban areas. A place-based approach would also prove highly beneficial, as local data, needs, digital literacy and levels of infrastructure can be assessed. This would also allow for evaluations to be set at the local level, rather than reflecting only national or regional policy needs.

- **The "garbage in, garbage out" problem has immediate practical and policy implications**. Many rural and non-urban areas utilize outdated and/or incomplete datasets, insufficient or unreliable infrastructure, and inadequate levels (compared to the need) of digital literacy/participation. Rural municipalities, local councils, community organizations, and SMEs may lack the expertise to critically assess the outputs based on machine learning models trained in urban contexts. AI literacy training for rural stakeholders in many operational contexts should be considered, as it could help them understand the limitations, risks, accountability, and ethical implications of policy decisions. Existing and new policies around AI use by or in government have yet to clearly articulate existing and new regulatory measures, clear lines of accountability, options for redress or opting out, or community- and place-based responsiveness. These gaps pose risks and should be addressed by striking a balance between progress - the need to remain economically viable - while still protecting the rights and needs of their citizens.

6. Conclusion

This project reviewed existing academic literature alongside government policies and reports, and industry commentary related to AI governance in Canada and Scotland and, more broadly, the United Kingdom, to explore whether and how the rights, needs, and concerns of rural places/people are considered (if at all) in this fast-moving area of policy development.

In total, 133 pieces of literature were sourced from the UK and Scotland, of which 96 were included in the review. In Canada, 91 pieces of literature were sourced and reviewed. Grey literature included blog posts, news articles, policy documents, toolkits, a Freedom of Information response, and an independently commissioned report. Academic literature was sourced from a wide array of journals in the fields of health, governance, digital policy, data and society, and cybersecurity, among others. With the exception of the policies identified in section 4.1.2, all resources used were published prior to September 2025.

Across the literature reviewed, the central finding is that, when/if governance *of/by* AI is implemented in rural areas, questions about power, representation, accountability, participation, and uneven development need to be addressed, lest we repeat the mistakes of previous technological rollouts into these places.

The key challenge is therefore not whether AI has a place in rural governance, but under what conditions and with what forms of support, democratic oversight, and guardrails are needed (as determined by those who utilize it and are affected by its use). Without rural place-based (or at the minimum 'rural proofed') governance models and frameworks, AI risks reproducing and intensifying existing rural marginalization, which will be rife with biases and inequalities already seen within current governance structures. This approach could not just fail to achieve its intended improvements; it could be the source of new and/or increased harm. Alternatively, if these are instead developed through participatory and rights-based approaches, AI may offer opportunities to strengthen rural governance capacity and improve service accessibility.

7. Knowledge mobilization activities

The research team has already undertaken several knowledge mobilization activities related to this review, as outlined below:

- A research brief was created as a summary of the project and the main findings. This research briefing is available online here.
- The findings of the scoping review were presented at the Social Science and Humanities Research Council Knowledge Mobilization Forum on the 6th May 2026 by Dr Wayne Kelly.
- The results of this review were included in a presentation by Dr. Ian Merrell ('How do Artificial Intelligence Image Generators view rural areas: A rural sociological perspective') at the Rural Entrepreneurial Conference, Newcastle, May 2026.
- Dr. Ian Merrell and Dr. Wayne Kelly met in-person with policy makers and civil servants of the Scottish Government in Edinburgh, April, 2026 to discuss the results of this synthesis review. This meeting included members of the Rural Policy, AI and Open Government teams. Participants requested further information (including the full report) and identified potential avenues for future collaboration and research on the topic.
- The research team submitted a manuscript based on this project's findings – the manuscript been accepted and is under review as part of the Journal of Community Informatics' Special Issue on Rural AI, with publication expected in Spring of 2027 - https://openjournals.uwaterloo.ca/index.php/JoCI/announcement/view/37

Additional knowledge mobilization activities are currently being developed, including:

- Blog posts and editorial/op-ed style publications are being developed by team members on the key themes identified in the scoping review, for publication in various outlets.
- Opportunities to present the findings of this review to practitioners and rural community leaders are being explored and pursued.

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9. Appendix

Appendix A. Scoping Review Search and Analysis Protocol

A1. Purpose and scope

The scoping review mapped academic and grey literature examining the intersections of rural development, artificial intelligence (AI), emerging digital technologies, and public policy in Canada and Scotland, including relevant literature from the broader United Kingdom.

The review sought to identify key concepts, applications, governance considerations, and knowledge gaps relevant to rural communities. The review paid particular attention to the conditions under which emerging technologies might support rural development and capacity building, and to their implications for equity, human rights, democratic governance, environmental sustainability, and community self-determination.

The review also considered rural agency, including communities' capacity to participate in technological decision-making and their right to refuse or resist technology-driven interventions.

A2. Research questions

The review was guided by five questions:

1. What is the scope and nature of current academic and policy literature addressing AI in rural governance and development?
2. How are emerging technologies applied or proposed in public policy interventions in rural Canada and Scotland?
3. What ethical, capacity, rights-based, and infrastructural considerations are identified in relation to AI and emerging technologies in rural areas?
4. How is rurality, or the right to be rural, conceptualized in the literature on digital governance?
5. What knowledge gaps exist concerning rural-specific considerations in AI-driven governance?

A3. Eligibility criteria

Inclusion criteria

Sources were eligible for consideration when they met the following criteria:

1. Published in English.
2. Focused on Canada, Scotland, the broader United Kingdom, or relevant international comparisons.
3. Addressed AI, emerging technologies, or digital governance in relation to rural development, public policy, or community capacity.
4. Presented conceptual, empirical, or policy-oriented analysis.
5. Included peer-reviewed articles, conference papers, government reports, white papers, NGO publications, think tank briefings, or other relevant grey literature.

Broader AI governance literature was considered where its findings or concepts were relevant to the review's rural governance questions.

Exclusion criteria

Sources were excluded when they:

1. Were unrelated to rural or regional governance and offered no applicable governance or policy insights.
2. Focused exclusively on urban or suburban contexts without relevance to the review questions.
3. Were published in languages other than English.
4. Addressed technologies exclusively from a technical perspective without relevant governance, policy, or social considerations.

The review's original publication cutoff was September 2025. The review treated subsequent policy developments discussed in the article separately.

A4. Information sources

Academic databases

1. Searches were conducted using Scopus, Web of Science, ProQuest, EBSCOhost, JSTOR, IEEE Xplore, and the Education Resources Information Center (ERIC). Grey literature
2. Additional sources included Google Scholar, government websites, newspapers, and other policy and research publications.
3. The team supplemented searches with snowball sampling to identify additional relevant publications.

A5. Search terminology

Table A1 presents the search terminology organized into four categories.

Table A1. Search Terms by Category

Category	Search Terms
AI and governance	Artificial intelligence; machine learning; blockchain; large language models; generative AI; predictive analytics; emerging technology; governance; policymaking; public administration; policy development; rural development; rural governance; AI-powered decision support; AI-driven public services; chatbot governance tools; data-informed governance
Geography	Rural; remote communities; rural Canada; remote Canada; Northern Canada; rural Scotland; remote Scotland; Scottish Highlands; Scottish countryside; peripheral
Digital inclusion and capacity	Digital capacity; digital equity; technology access; infrastructure development; digital divide; digital literacy

Rights, ethics, and exclusion	Data sovereignty; digital rights; digital self-determination; ethics; accountability; resistance; opposition; digital refusal; community exclusion; rights to refuse; right to be rural

A6. Study selection

Source selection proceeded in two stages.

- Stage 1: Title and abstract screening. Two reviewers assessed potentially relevant publications against the inclusion and exclusion criteria.
- Stage 2: Full-text review. Publications passing initial screening were assessed in greater detail for relevance to the research questions.