Where We Build Matters

Land use planning for safety, affordability, and resilience

Pacific Institute for Climate Solutions

Authorship team

Alyssa Hill
Project Analyst,
Pacific Institute for Climate Solutions

Dylan Clark
Director of Research Mobilization, Pacific Institute for Climate Solutions

Dr. Andréanne Doyon
Associate Professor, School of Resource and Environmental Management, Simon Fraser University

Dr. Ian Mauro
Executive Director,
Pacific Institute for Climate Solutions
Professor, School of Environmental Studies, University of Victoria

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The Pacific Institute for Climate Solutions

The Pacific Institute for Climate Solutions (PICS) was created in 2008 with an endowment from the Government of British Columbia to support evidence-based climate policy. During development of PICS' Strategic Plan: 2024 and Beyond, the Decision Impact Stream was created to elevate PICS' academic network and support B.C. decision makers with climate solutions. In fulfillment of Decision Impact's mandate, this project draws on academic and practitioner expertise to offer new empirical evidence, comparative analysis, areas for future research, and recommendations for governments and decision makers across B.C.

Territory acknowledgement

At the University of Victoria, where PICS is hosted, we acknowledge and respect the Lək̓ʷəŋən (Songhees and Xʷsepsəm/Esquimalt) Peoples on whose territory the university stands, and the Lək̓ʷəŋən and WSÁNEĆ Peoples whose historical relationships with the land continue to this day.

PICS and its university network have campuses across the province known as British Columbia. We respect and acknowledge the many unceded traditional territories and Nations where PICS universities stand including: xʷməθkʷəy̓əm (Musqueam) • Sḵwx̱wú7mesh Úxwumixw (Squamish) • səlilwətaɬ (Tsleil-Waututh) • q̓ic̓əy̓ (Katzie) • kʷikʷəƛ̓əm (Kwikwetlem) • Qayqayt • Kwantlen • Semiahmoo • Tsawwassen • Stó:lō • Syilx (Okanagan) • Dakelh (Carrier) territory: Lheidli T'enneh, Lhtako, Nazko, Lhoosk'uz • ?Esdilagh, a Tsilhqot'in Nation • Dane-zaa territory: Doig River, Blueberry River, and Halfway River • Tsimshian territory: Kitsumkalum, Kitselas, Lax Kw'alaams, and Metlakatla • and Gitwinksihlkw, a Nisga'a Village.

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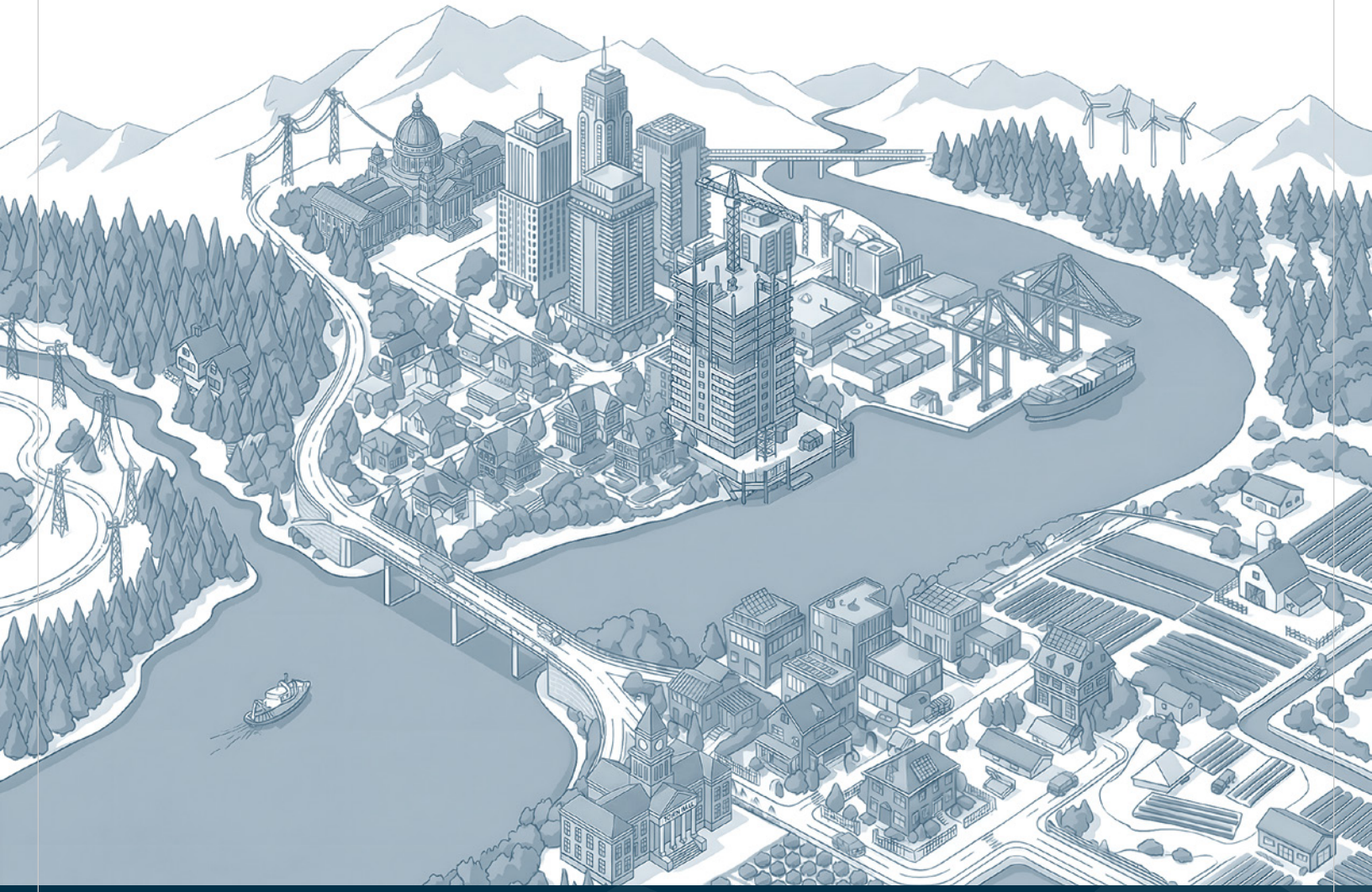


Executive Summary

In recent years, British Columbia (B.C.) has experienced record-breaking wildfire seasons, catastrophic floods, and repeated evacuations. These disasters have disrupted communities and strained public finances. Recovery costs have added to the provincial deficit, insurance premiums have risen, and some households lost coverage. At the same time, governments are accelerating housing starts to address affordability and supply shortages. New homes, roads, and infrastructure are being built in areas exposed to floods, wildfires, and other hazards. These development decisions will shape exposure for decades, locking households and public systems into long-term climate risk in an increasingly unstable environment.

Exposure to hazards and future losses are not inevitable but instead shaped by policy choices. Land use and development decisions define whether new homes are built in flood-prone areas or near forests at risk of wildfire. These choices determine whether risk is avoided and reduced or deferred to future taxpayers through disaster response and recovery.

The issue is not an absence of policy tools, but their fragmented and inconsistent application. B.C. has policy tools that create room for climate hazards to be considered in land use decisions, but the tools are not consistently used. Further, hazard information, planning decisions, and financial consequences are not linked. The result is a fragmented system that often responds to risk after losses occur instead of reducing exposure before it is created.

Land use planning is one of the most powerful levers for changing B.C.'s risk trajectory. It is where growth patterns are set, risks are either reduced or embedded, and long-term financial commitments begin. Land use planning is also an area where reconciliation and collaboration with First Nations on their territories can be supported and addressed. When climate risk is integrated early and consistently into planning decisions, governments can avoid creating new exposure and manage risks proactively rather than paying for them later.

Choices about land use also influence housing affordability, cost of living, and government spending. When these issues are addressed in isolation, trade-offs are often pushed downstream. Climate change makes reactive approaches increasingly costly and less sustainable. Integrating climate risk into land use governance allows growth, housing, and resilience objectives to be pursued together rather than in tension and offers a more stable and predictable path forward.

This report outlines how B.C. can strengthen governance of climate risk through land use planning. The analysis examines how climate risk is currently considered within B.C.'s land use system and where gaps and opportunities exist. The analysis reviews provincial legislation, policy frameworks, and adoption of planning tools, and draws on examples from other jurisdictions that have strengthened the link between climate risk and land use decisions.

Three best practices emerge from the analysis:

- First, governments and the public have access to hazard information that can be used to inform decisions.
- Second, land use direction is clear, consistent, and coordinated so that climate risk is methodically considered alongside other priorities.
- Third, financial and insurance signals reinforce risk reduction rather than operate independently of planning decisions.

These pillars function as foundational components of a climate-informed land use system. When hazard information, planning direction, and financial signals reinforce one another, exposure can be reduced before it becomes embedded in communities. Without structural coherence, current development patterns risk entrenching higher long-term disaster losses, infrastructure liabilities, and insurance costs.

Many local governments, practitioners, and organizations across B.C. are actively advancing climate-informed planning. However, a system that relies primarily on voluntary engagement and good intention is not effective governance. This report identifies six practical recommendations to strengthen coordination, align financial and political incentives, reduce long-term disaster costs, and improve long-term resilience. Their implementation should be guided by three cross-cutting principles:

1. upholding Indigenous Rights and Title;
2. respecting local contexts and governance capacities; and
3. accounting for disproportionate impacts.

Recommendation	Summary	Implementer(s)
PILLAR 1: Accessible and decision-relevant climate hazard information	**1.1** Develop standardized climate hazard information to support clear market signals and protect constituents	Government of British Columbia (Ministry of Emergency Management and Climate Readiness)
	1.2 Introduce standardized public disclosure requirements for climate hazard exposure in real estate and rental transactions	Government of British Columbia and provincial regulators
PILLAR 2: Clear, coordinated, risk-informed decision-making	**2.1** Align provincial mandates to support consistent, risk-informed land use decisions	Government of British Columbia (cross-ministry)
	2.2 Ensure local governments have clear direction to regulate development in hazardous areas	Government of British Columbia (cross-ministry) in collaboration with local governments
PILLAR 3: Alignment between vision and incentives	**3.1** Reform disaster financial assistance to discourage new exposure to climate hazards	Government of British Columbia (Ministry of Emergency Management and Climate Readiness)
	3.2 Use insurance market signals to inform climate risk governance	Government of British Columbia and provincial regulators

Managing climate risk is not solely a technical challenge; it is a governance challenge. Without deliberate alignment, hazard information, land use decisions, and financial signals operate like disconnected parts of a system, each influencing outcomes but not reinforcing one another. Strong provincial leadership is required to bring these components into alignment around a common objective: reducing long-term exposure before it is embedded in communities and public balance sheets. The six recommendations in this report provide a structured path to achieve that integration and to embed risk reduction into everyday land use decisions.

Where we build matters:

Decisions about how and where communities grow influence affordability, household costs, infrastructure efficiency, exposure to hazards, and long-term public liabilities.

SECTION 1:

Introduction and Context

Where people live shapes their daily lives and long-term resilience. Decisions about how and where communities grow influence affordability, household costs, infrastructure efficiency, exposure to hazards, and long-term public liabilities. These decisions also persist for decades. Once land is developed and infrastructure is built, patterns of risk and investment become difficult and costly to reverse.

Across B.C., governments face intense pressure to accelerate housing delivery. In a volatile economic environment, there is strong emphasis on speed, scale, and certainty in land use decisions. At the same time, climate change is intensifying the frequency and intensity of hazards such as wildfires, floods, and extreme heat. Where and how development occurs now will shape future disaster losses, insurance costs, and government deficits.

Land use planning is how governments make choices about growth and change in their communities. Through a number of policy tools, governments can decide what can be built, where it can be built, and under what conditions to meet their housing, social, environmental, and economic needs. In principle, land use planning is systematic, integrated, and iterative. In practice, it happens amid competing pressures and policy objectives.

This report examines how B.C. can strengthen governance of climate risk through land use planning. To begin, this section explores how land use planning offers governments an opportunity to align land use and development with safety, affordability, and long-term resilience.

Climate risk and resilience

Climate change is already reshaping risk across B.C. Flooding, wildfires, extreme heat, and other hazards are affecting communities, infrastructure systems, and emergency services.[1] These hazards affect communities, infrastructure systems, and emergency services across B.C. The impacts, however, are not evenly distributed. Patterns of development, housing access, and infrastructure provision shape who is exposed to risk and who has capacity to prepare for and recover from climate events. Climate change is projected to further intensify many hazards in the years ahead.[2]

Neighbourhoods that were previously safe are facing new risks. Land use planning shapes how people and buildings are exposed and vulnerable to climate hazards. Zoning determines whether development occurs. Density, urban design, and tree canopy influence heat exposure. Development permit requirements affect how well buildings perform during extreme events. Over time, these decisions either lock additional risk into communities or reduce long-term exposure. Integrating climate risk into land use decisions can therefore reduce future losses and improve community resilience.

Housing supply and affordability

B.C. faces persistent housing supply and affordability challenges.[3,4] In response, governments have introduced reforms to accelerate housing approvals and increase density in urban areas.[5] Expanding housing supply is a central and necessary policy objective.

However, housing approved today will shape exposure to climate risk for decades. Residential buildings and supporting infrastructure are long-lived assets. Once constructed, land use patterns often persist for generations.[6] Land use decisions and construction standards that do not integrate climate risk can embed long-term costs and liabilities in communities. Conversely, directing growth toward lower-risk, well-serviced areas can reduce long-term household and public costs while supporting sustained housing supply.

Cost of living

The rising cost of living is placing more pressure on British Columbians. Beyond housing prices, households face growing expenses related to transportation, utilities, food access, and insurance. For many households, these pressures are cumulative and reduce financial resilience over time.

Land use patterns influence many of these costs. Where homes are built affects commuting distances, transportation expenses, and access to jobs and essential services. Development in areas exposed to floods, wildfires, or extreme heat can increase insurance premiums and repair costs following major events. At the same time, low-density or dispersed growth can raise the cost of building and maintaining roads, water systems, and emergency services. In contrast, growth in well-serviced areas can reduce long-term infrastructure and operating costs.[6] Over time, these decisions shape both household affordability and public spending pressures.

Fiscal pressures and disaster costs

Governments across B.C. face increasing fiscal pressures and limited ability to absorb additional long-term liabilities.[7] Disaster response, recovery, and infrastructure repair costs have risen significantly in recent years, placing additional strain on provincial and local budgets.[8,9] These expenditures are often unplanned and episodic, making them difficult to manage within existing fiscal frameworks.

Land use decisions influence the scale and frequency of disaster costs. Approving development in areas exposed to flood or wildfire without adequate mitigation can increase future disaster assistance payouts, infrastructure repair costs, and ongoing maintenance obligations. Even where protective infrastructure is built to enable development, local governments typically assume responsibility for operating and maintaining these systems over time. Continued development in a handful of high-risk areas could expose the Province to up to $1.1 billion in average annual flood losses and $1.6 billion in wildfire losses.[10] Repeated losses in the same locations reduce fiscal flexibility and divert resources from other public priorities. Over time, patterns of development become patterns of liability.

Land use planning as an intervention and opportunity

Climate risk and resilience, housing supply, cost of living pressures, and fiscal pressures are often addressed through separate policy processes. In practice, these issues converge through land use decisions (Figure 1).

FIGURE 1: LAND USE PLANNING PRESENTS AN OPPORTUNITY TO ADDRESS DEFINING PRESSURES IN INTEGRATED AND COST-EFFECTIVE WAYS

Through zoning, density rules, development approvals, and infrastructure planning, governments influence where growth occurs, how risk is distributed, and how long-term costs are structured. Decisions about land use shape exposure to climate hazards, household transportation and service costs, infrastructure efficiency, and future public liabilities. While these objectives are frequently pursued independently, land use planning presents an opportunity to address pressures in integrated and cost-effective ways.

Land use planning does not eliminate trade-offs. However, it plays a central role in determining whether new development increases long-term exposure and fiscal risk or supports more resilient and cost-effective patterns of growth. Growing climate risks across B.C. will amplify these pressures.

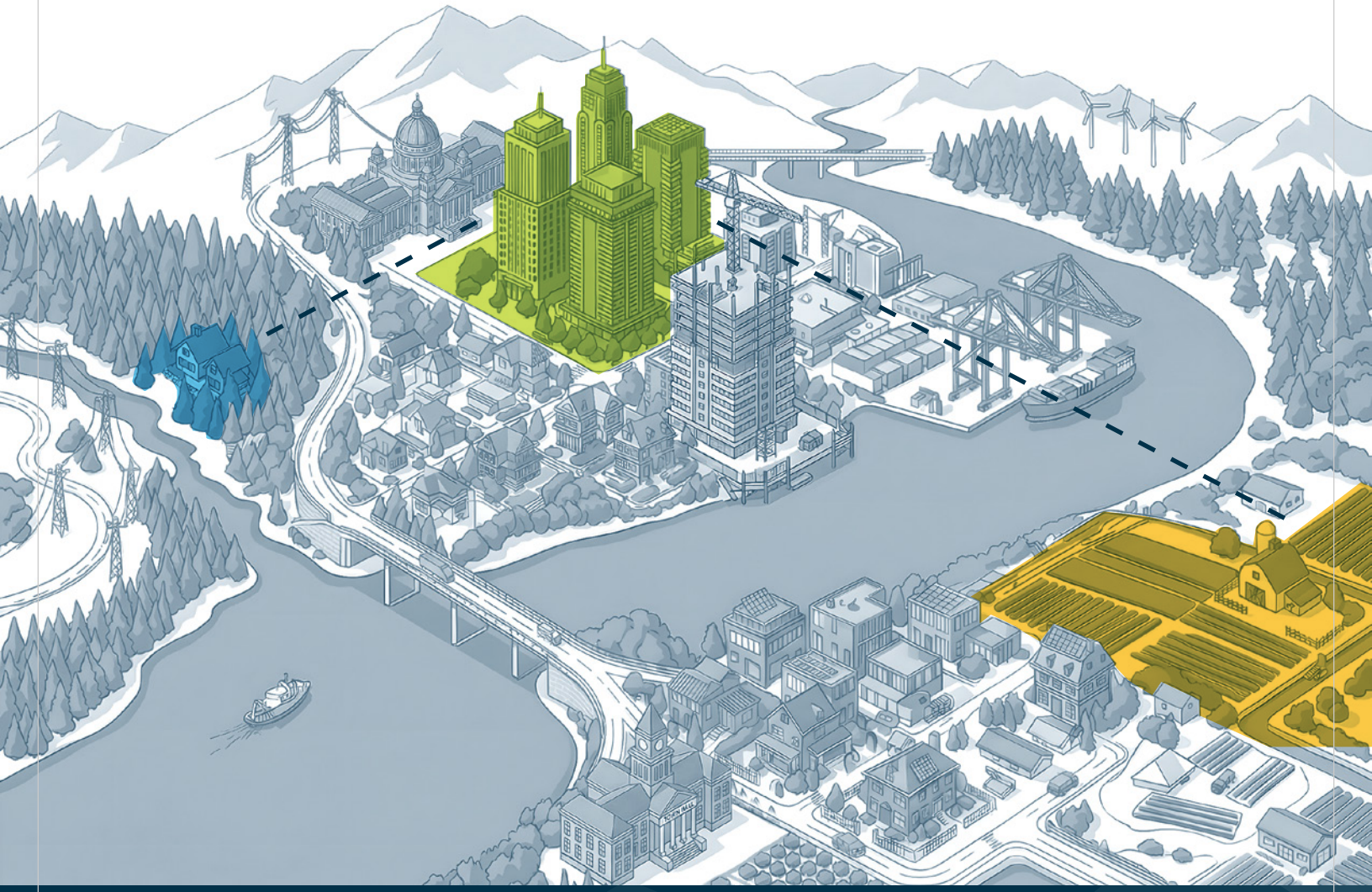
In this report, we examine how the local government land use planning system in B.C. currently addresses climate risks. We focus on the roles, responsibilities, and policy tools that shape development decisions across the province and examine how land use planning interacts with broader risk management. We synthesize information to identify where current approaches align with best practices and where gaps or constraints limit coordinated and effective decision-making. The report concludes with recommendations to strengthen climate-informed land use planning in B.C.

The remainder of the report is structured as follows:

- **Section 2** describes the report's synthesis approach.
- **Section 3** presents the state of land use planning for climate risks in B.C.
- **Section 4** discusses best practices and principles to support a climate-informed land use system.
- **Section 5** provides recommendations to build on B.C.'s current system and shift toward climate-informed land use planning.

The power of planning:

Land use planning plays a central role in determining whether new development increases long-term exposure and fiscal risk or supports more resilient and cost-effective patterns of growth.



SECTION 2:

Synthesis Approach

Land use planning for climate risk does not arise from any single policy or decision point. Instead, it reflects how legislation, guidance, local discretion, and professional practice interact over time.

Our synthesis approach to this report combines technical analysis, empirical data, policy review, and practitioner insight. This approach allows us to move beyond individual tools to examine how land use planning operates as a system. Figure 2 shows how multiple sources of analysis inform our assessment of land use planning for climate risk.

We commissioned three academic-led technical papers to inform this report foundational analysis and provide comparative insight. Land Use Planning in a Changing Climate Report 1 and Report 2 analyze land use planning in the context of a changing climate, including key concepts, policy considerations, and implications for resilience. Building Climate-Informed Land Use Policy in British Columbia: A jurisdictional analysis provides a jurisdictional scan of climate-informed land use policy frameworks in Canada and internationally, with a focus on jurisdictions that share governance, legal, or geographic characteristics with B.C. Collectively, these papers informed our identification of relevant policy tools, institutional arrangements, and emerging best practices for integrating climate risks into land use planning.

To complement this work, we also commissioned a province-wide database of climate-informed land use planning tools used by local governments in B.C. The database captures whether each municipality and regional district had adopted: (1) a floodplain bylaw; (2) a development permit area (DPA) for hazardous conditions or natural hazards; and/or (3) climate action plan (a proxy for broader climate-related planning capacity and policy attention). We analyzed tool adoption in relation to geographic region, local government type, population size, presence of a regional growth strategy (RGS), and flood risk exposure to identify patterns in uptake and variation across the province. The database did not assess land use planning tools for unincorporated electoral areas.

We also drew on a targeted review of policies, literature, and practitioner experience. This included a review of relevant provincial policies and plans, academic literature, and media related to land use, housing, and climate risk and adaptation. In addition, we conducted five semi-structured interviews

FIGURE 2: APPROACH FOR SYNTHESIZING ACROSS MULTIPLE SOURCES OF ANALYSIS

Aerial landscape picture of Fraser River and farms near Chilliwack. *iStock*

with local government staff to explore how climate risk considerations are navigated within land use planning practices, including how discretion, capacity, and political context shape decisions*. Interview participants represented a range of rural and urban contexts, geographic regions, climate risks, and local government types. We selected local governments based on their experience with climate events and/or publicly available policies or plans demonstrating integration of climate risks into land use planning.

Drawing on the technical analysis, the jurisdictional scan, and broader literature, we identified three pillars and three cross-cutting principles that underpin climate-informed land use planning. These pillars and principles form the analytical framework for our recommendations and are used to outline how B.C. can shift toward more systematic and effective integration of climate risks into land use planning.

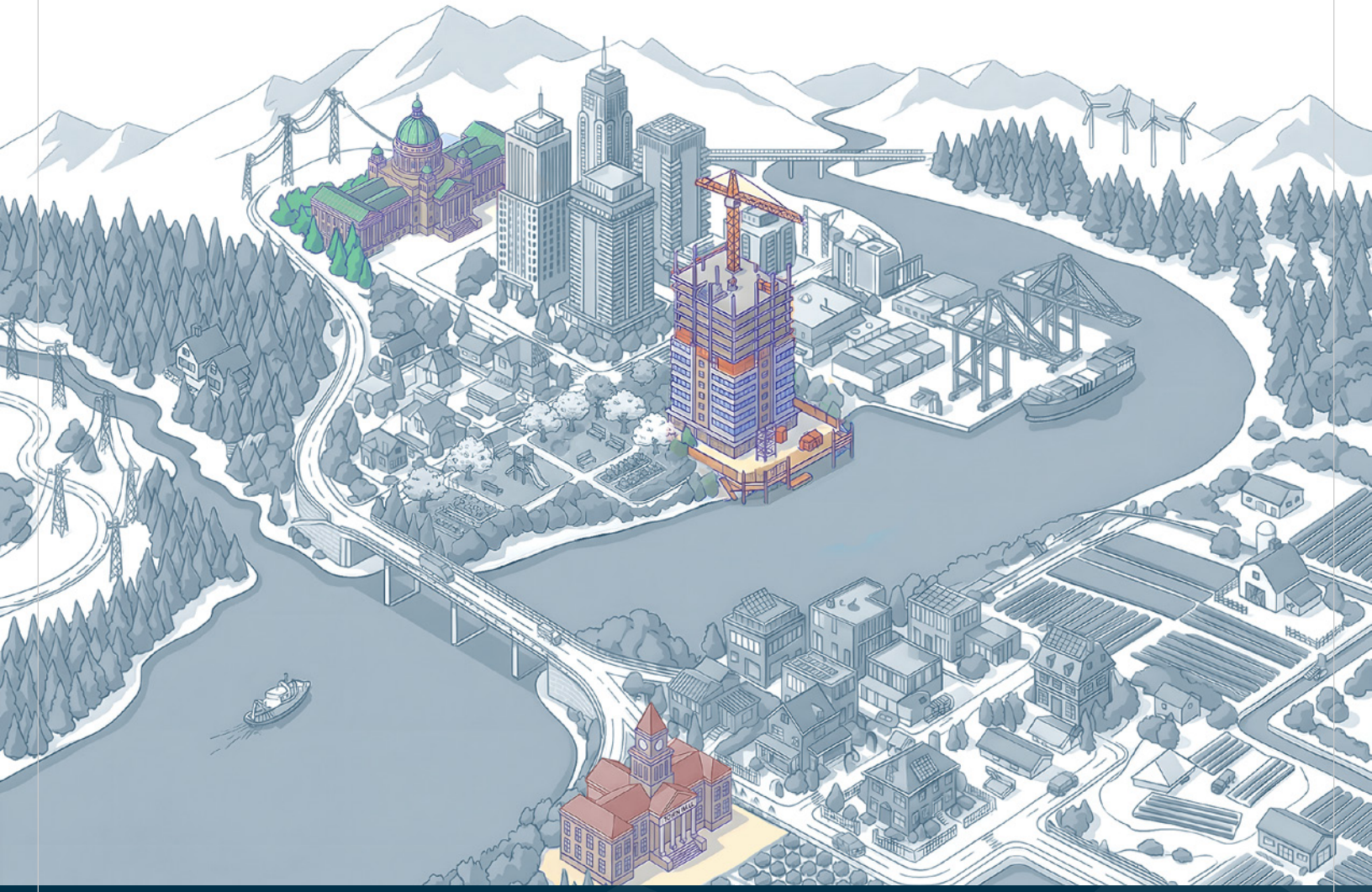
Our analysis focuses on land use planning and development by municipalities and regional districts. We do not assess land use planning and development decisions on federal or provincial administered lands or natural resource tenures. Since B.C. is largely in unceded First Nations territory, land use governance and climate adaptation tensions are critically important. However, these issues are beyond the scope of this report. Similarly, the impact of land use planning on First Nations' treaty or reserve lands in B.C. is a critical and distinct area for further analysis, but is not covered by this report. However, the authors acknowledge that land use planning has constitutional, jurisdictional, cultural, ecological, and economic implications that are rapidly evolving in policy, in the courts, and in public dialogue, especially in B.C. Indeed, land use governance is arguably at the heart of reconciliation, and additional research and dialogue in this area is vitally important to climate adaptation and societal resilience.

By combining formal policy and legislative review with empirical data on tool adoption and insights from practitioners, we can trace how roles, discretion, and capacity interact across provincial and local scales. This synthesis provides the basis for the assessment that follows in Section 3, where we examine the legislative framework for land use planning in B.C., how decisions are made in practice, and the outcomes this structure produces for climate risk and long-term cost. This provides a B.C. point of reference for Section 4, where we present best practices and principles, and Section 5, where we suggest how B.C. could build on the current system and shift toward climate-informed land use planning.

* UVIC Research Ethics Board protocol #24-0140

The Jurisdictional Gap:

The provincial government bears the financial burden of climate response and recovery, yet direct land use authority remains with local governments under provincial enabling legislation. The result is a fragmented landscape of reactive and inconsistent climate risk management.



SECTION 3:

State of Land Use Planning for Climate Risks in B.C.

In this section, we outline how B.C.'s land use planning system currently integrates climate risks. We differentiate between (1) the formal roles, responsibilities, and tools defined in legislation, (2) how land use decisions are made in practice, and (3) the system-level outcomes this governance structure produces. Together, these perspectives help explain why climate risks continue to be unevenly managed across the province.

3.1 Roles and responsibilities in B.C.'s land use system

What the rules say: B.C.'s land use planning system is structured around authority delegated to local governments, with senior governments shaping outcomes through legislation, policy direction, and oversight.

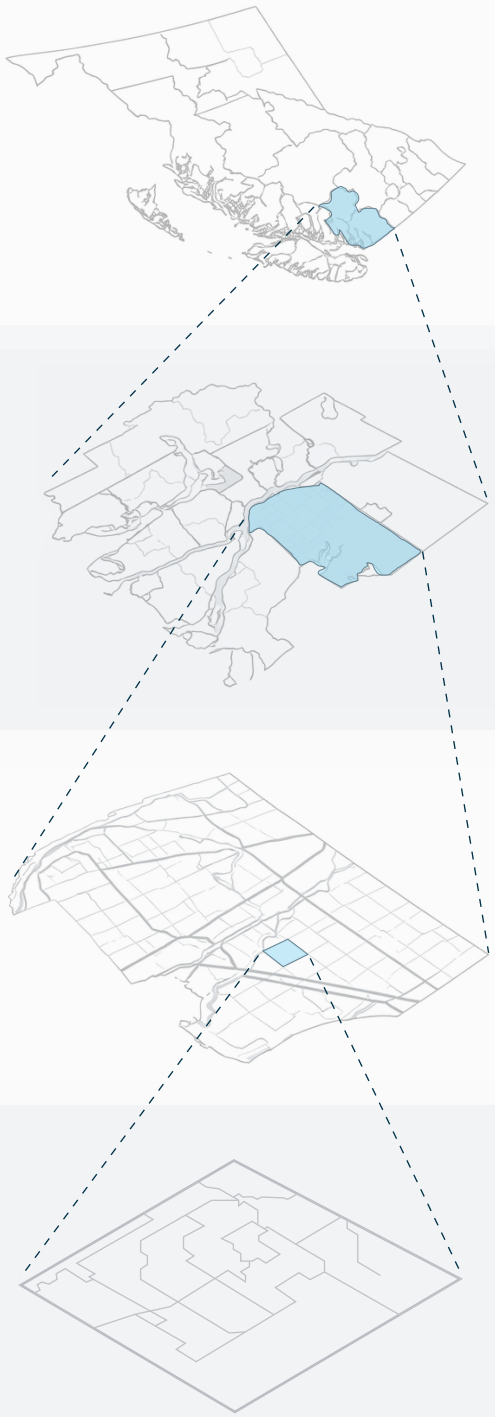
B.C.'s land use planning and development system for privately held land operates primarily through local governments (regional districts and municipalities) using authorities delegated to them. Key provincial legislation includes the Local Government Act,[11] Community Charter,[12] and Land Title Act[13] with several other acts that overlap with land use planning in specific circumstances*.

Land use responsibilities differ based on jurisdiction (Figure 3). Both regional districts** and municipalities oversee and implement land use planning and development within their jurisdiction. Regional districts provide land use planning services for all electoral areas and municipalities that opt in. Regional districts can also provide voluntary services like regional growth management across their region.[14]

This delineation of responsibility gives local governments flexibility amid B.C.'s diverse landscapes, land uses, service demands, and community needs. However, the structure also lends itself to fragmentation and uneven incorporation of climate risk into decision-making.

B.C.'s land use system puts local government at the centre of most land use decision-making, with the Province shaping outcomes through legislation, policy, and oversight.

FIGURE 3: GOVERNMENT ROLES AND RESPONSIBILITIES IN B.C.'S LAND USE SYSTEM



Note: There are more than 200 First Nations across the province that have their own distinct Indigenous governance systems. First Nations experience a range of authority over land use planning from federal oversight to self-governance.

* A handful of local governments are governed by their own provincial legislation with distinct land use planning responsibilities, for example, Vancouver [14] and Islands Trust [15].

** Regional districts are comprised of municipalities, electoral areas, and sometimes Modern Treaty Nations.

First Nations land governance in B.C.

Land use planning in British Columbia is happening within an evolving legal and governance context. For millennia, Indigenous Peoples have governed, stewarded, and cared for their territories based on Indigenous laws, customs, and responsibilities.[15] Those systems of governance did not go away with colonization, even though they were displaced or suppressed.

Two legal frameworks shape the evolving state legal context for land use governance.

First, Section 35 of Canada's *Constitution Act*, 1982[16] recognizes and affirms existing Aboriginal and treaty rights, which includes Aboriginal title. Courts recognize title as a propriety interest and, where established, regulatory decisions must comply with consent-like requirements. Court decisions have interpreted the purpose of section 35 as reconciliation with negotiated agreements between First Nations and the Crown identified as the appropriate path towards that end. Courts consistently affirm that Aboriginal Rights and Title existed long before colonial governance structures and exist now whether or not they are recognized by the Crown.[17]

Dating back to the mid-nineteenth century, the Province has been asserting title to most land in B.C. as "Crown" land and controls its use and management. Local governments do not have inherent jurisdiction, but exercise delegated powers granted by provincial statute on the small portion of the B.C. landscape that is private land. This power is delegated through the Local Government Act and the Community Charter. Local government authority is therefore a subset of provincial legislative authority and operates within the constitutional limits that bind the Province.

A declaration of Aboriginal title transforms the Crown's relationship to the land and limits the Province's ability to regulate, sell, or authorize uses (as the *Cowichan Tribes v. Canada case*[18] confirmed). This builds on the Tsilhqot'in decision, where the Supreme Court of Canada affirmed Aboriginal title including the right to decide how land is used.[19] State governments cannot extinguish Aboriginal title without clear and plain intent. Municipal powers are also exercised within these constitutional boundaries.

The second legal framework is B.C.'s Declaration on the Rights of Indigenous Peoples Act (DRIPA)[20] that commits the Province to make its laws consistent with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)[21] and to advance reconciliation through shared decision-making agreements and action plans. DRIPA creates a statutory pathway for implementing reconciliation in provincial law and policy, including land use planning, ecosystem and watershed health, climate action, and disaster risk reduction.[22–24] Because DRIPA was enacted in 2019, jurisprudence is just emerging, which includes the *Gitxaała v. B.C.* case, which affirms the application of UNDRIP in B.C. law.[25]

In practice, how to uphold Rights, Title, and responsibilities towards land as part of the shift toward shared decision-making in B.C. remains unresolved.[17] As it stands, local governments have statutory obligations to consider First Nations perspectives in their land use planning framework, but the Province provides limited guidance on how to engage on climate-related land use decisions. Rapidly evolving jurisprudence and possible legislative changes related to DRIPA have direct albeit yet-to-be determined implications for land use planning.

For a report focused on local government land use planning, the key point is this: Municipal authority in B.C. is not absolute and does not operate in isolation. The Province of B.C. delegates to local governments their land use power and the scope of that delegation can easily change.

Provincial policy includes statutory frameworks, requirements for plans and bylaws, guidelines, and legislation where provincial interests apply. These interests presently include growing B.C.'s housing supply, development affecting highways, riparian areas, agricultural land, water use, and archaeological sites (Appendix A, Table A1).

Land use decisions do not occur in a vacuum. Developers, property owners, non-government organizations, members of the public, qualified professionals, and insurance and financial institutions all influence land use outcomes, even when they do not hold formal planning authority:

- Developers, property owners, non-government organizations, and members of the public shape land use decisions through development proposals, public hearings, and political pressure.
- Qualified professionals inform development decisions through technical assessments where required.
- Insurance providers influence outcomes through coverage availability, pricing, and incentives for risk reduction. Further, both public and private lenders influence access to capital and growth patterns.

Understanding how land use roles, authorities, and influences interact is a necessary first step to assessing how effectively B.C.'s land use planning system manages climate risk, and where changes may be needed. Taken together, provincial legislation provides a general framework for land use planning on privately held land with local governments holding primary authority for land use decisions. For the most part, roles and responsibilities are clearly delineated, although reconciliation and land use questions with First Nations remain. As we layer climate risk considerations in the next section, we begin to see how the current structure of roles and responsibilities reinforce or undermine efforts to manage climate risk.

3.2 Integration of climate risks into land use planning in B.C.

What the rules say: Provincial legislation and guidance provide multiple entry points for considering climate hazards in land use planning, while leaving decisions about whether and how to regulate development in hazardous areas largely to local government discretion.

In B.C., responsibilities related to climate preparedness and adaptation span multiple orders of government. The Province primarily plays a coordinating role through legislation, guidance, funding programs, and oversight. Local governments are responsible for land use planning, development approvals, emergency management, flood management, and in many cases, diking. They are also expected to consider climate risks across their portfolio. This division of responsibility places local governments on the front lines of managing climate-related hazards and their impacts.

Notably, local governments are not legislatively required or mandated to undertake adaptation.[26] Instead, provincial legislation enables local governments to draw on a range of planning and regulatory tools to address climate and hazard risks (Figure 4). These tools include long-range strategic plans, regulatory bylaws, and site-specific development controls (Table 1, Appendix B). While they provide multiple opportunities to consider climate risk, they vary in scope, enforceability, and the hazards they address, shaping how consistently and effectively climate risks are integrated into land use decisions in practice. At present, tools are designed for natural hazards but do not directly consider or address risks related to extreme weather.

Several provincially defined processes introduce climate risk considerations at other important development stages (Figure 4). Subdivision approval, bare land strata approvals, and building permits can trigger hazard assessments prepared by qualified professionals. Covenants can accompany these approvals or other bylaws to restrict land uses, require mitigation measures, or assign responsibility of risk to property owners. While these mechanisms can manage risk at individual parcels, they do not reduce exposure across hazardous areas and may shift responsibility for assuming risk rather than reducing risk.

FIGURE 4: SIMPLIFIED VERSION OF THE LAND USE AND CLIMATE RISK SYSTEM IN B.C.

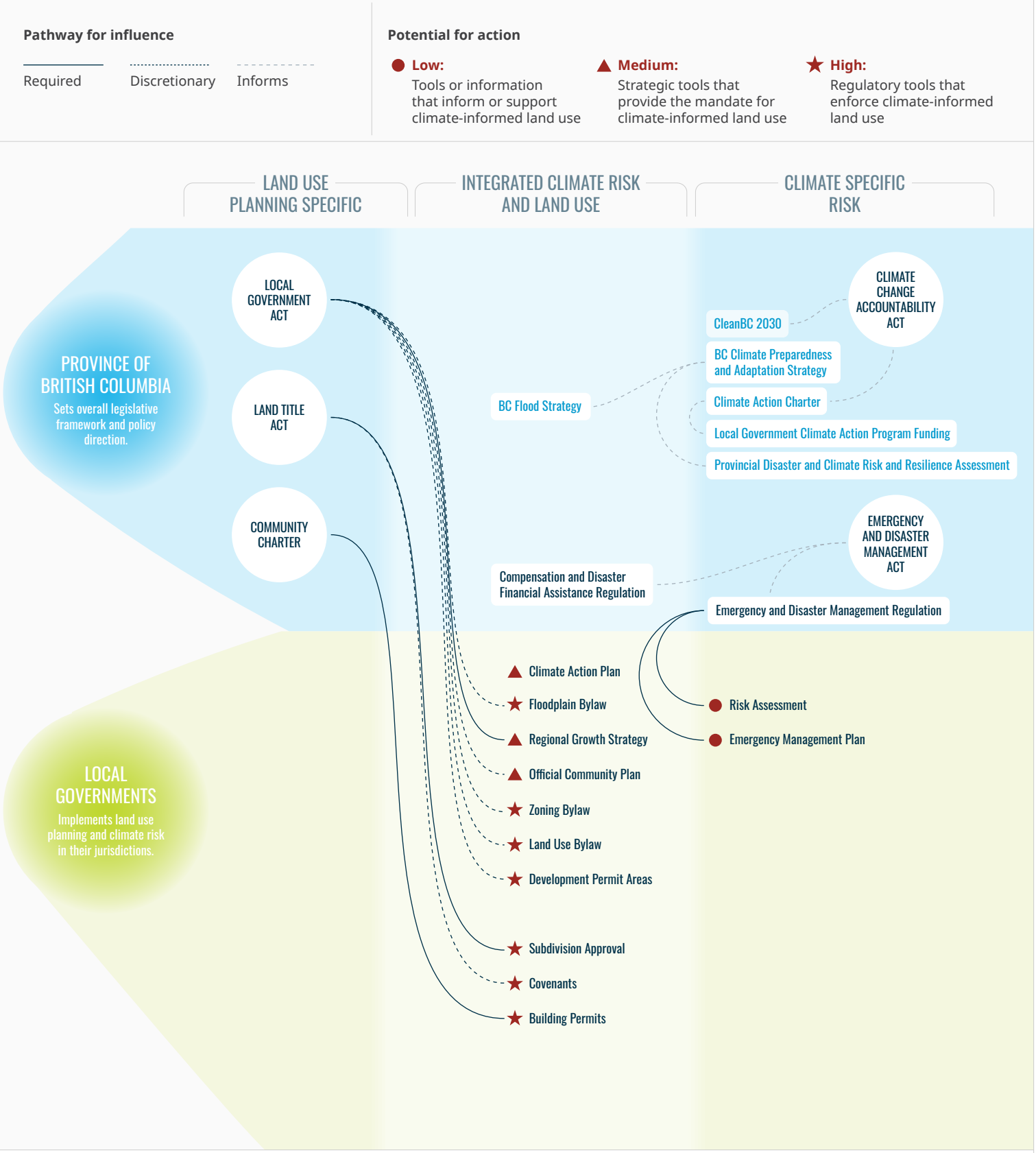


TABLE 1: KEY LAND USE POLICY TOOLS OUTLINED IN PROVINCIAL LEGISLATION THAT CONSIDER CLIMATE HAZARDS*

Policy tool	Description of climate hazard lens
Regional growth strategy (RGS)	Long-range strategic planning document for regional districts, member municipalities, electoral areas, and sometimes Modern Treaty Nations with directives to work toward "settlement patterns that minimize the risks associated with natural hazards." [11] (§428(2)(k))
Official community plan (OCP)	Long-range strategic planning document for local governments which outlines land uses, including development locations and density which should respect "restrictions on the use of land subject to hazardous conditions or that is environmentally sensitive to developments." [11] (§473(1)(d))
Zoning bylaw	Bylaws that regulate different lands uses, densities, and detail development permit areas or other hazard-related restrictions or provisions.[11] (§479)
Floodplain bylaw	Bylaws that designate areas as a floodplain where setbacks, flood construction levels, and other provisions apply.[11] (§524)
Development permit area (DPA)	Areas designated in OCPs and/or zoning bylaws where specific requirements or provisions are needed to protect development from hazardous conditions.[11] (§488)

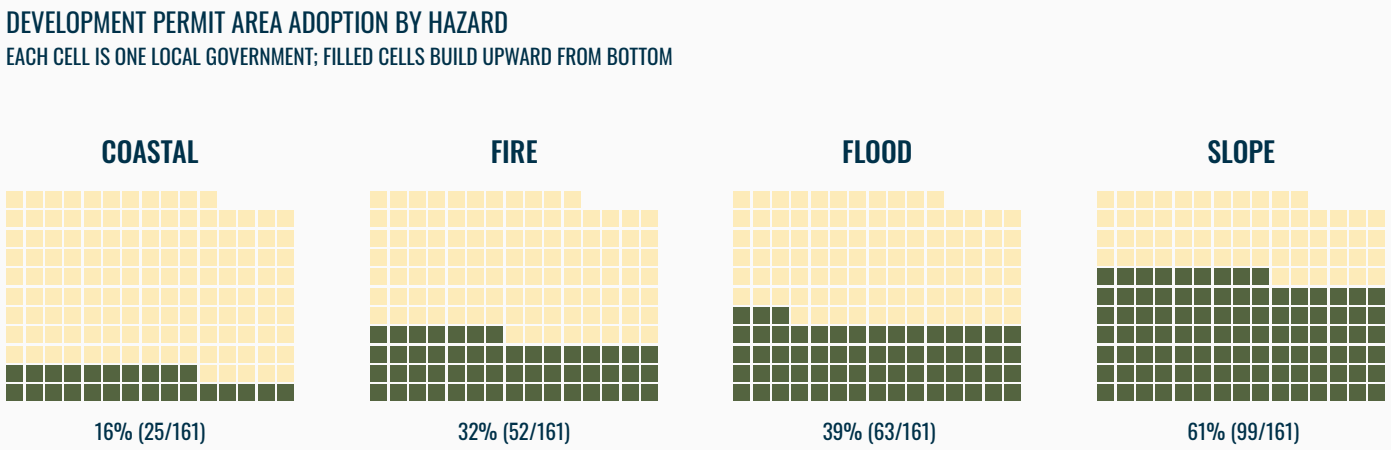
*See Appendix B for a comprehensive list, description of tools, and sources

Local governments may also identify and address hazards through emergency management responsibilities or other voluntary planning initiatives (Figure 4). For example, the forthcoming Emergency and Disaster Management Act[27] regulations are expected to require local governments to prepare risk assessments and emergency management plans that consider climate hazards and extreme weather events. Many local governments may also choose to develop climate or hazard-specific plans or programs, such as a community wildfire resiliency plan, flood management plan, or extreme heat plan. Plans such as an Urban Forest Strategy have broader goals but can reduce climate risks while offering many other co-benefits. These plans can inform land use decisions, but they often sit outside statutory planning processes and may not consistently influence development approvals (Figure 4).

The provincial land use planning and emergency management framework creates several points where local governments are encouraged to consult or engage with First Nations. For example, local governments must consider whether consultation with First Nations is required when developing or updating official community plans,[11](§475(2)(b)(iv)) and emergency management legislation requires engagement with Indigenous Governing Bodies and inclusion of Indigenous Knowledge in risk assessments where available.[28](§51(4)(b)) The Province has not articulated expectations for how climate risk and long-term adaptation should be addressed collaboratively through land use planning. Some local governments and First Nations have partnered or collaborated on climate risk and resilience and land use initiatives (e.g., City of Merritt's Indigenous engagement on flood mitigation,[29] North Shore Emergency Management's resilience initiatives in partnerships with Squamish First Nation and Tsleil-Waututh Nation.[30] The First Nations Leadership Council has also set priorities for First Nations' climate action and disaster risk reduction.[22, 23]

Taken together, provincial legislation enables climate risks to be addressed in land use decisions with local government discretion to decide whether, and how, climate risks are addressed. Figure 4 reveals how this decentralization creates the circumstances for fragmented and disparate approaches rather than a single, coordinated decision pathway. The following section will examine how this discretion translates into practice across the province.

FIGURE 5: ADOPTION OF DEVELOPMENT PERMIT AREAS (DPAS) BY HAZARD TYPE AMONG MUNICIPALITIES IN B.C.



Each panel represents one hazard type (coastal, fire, flood, slope). Each square corresponds to a single municipality, with filled cells indicating the presence of a DPA and unfilled cells indicating no DPA. Cells accumulate upward from the bottom, visually representing the total number and proportion of governments with a DPA for each hazard. The percentage and count of adopting governments are shown beneath each panel.

3.3 Land use and climate risk policy adoption across local governments in B.C.

Policy adoption snapshot: Local governments have access to several land use and climate planning tools, but adoption varies widely across jurisdictions and hazards.

This section summarizes adoption patterns for DPAs, floodplain bylaws, and climate action plans across B.C.'s 161 municipalities and 27 regional districts based on a dataset commissioned from Dr. Andréanne Doyon and Alli Di Giovanni.[31] The analysis describes uptake, not the quality or effectiveness of the tools, and provides a baseline for tracking coverage gaps and integration over time.

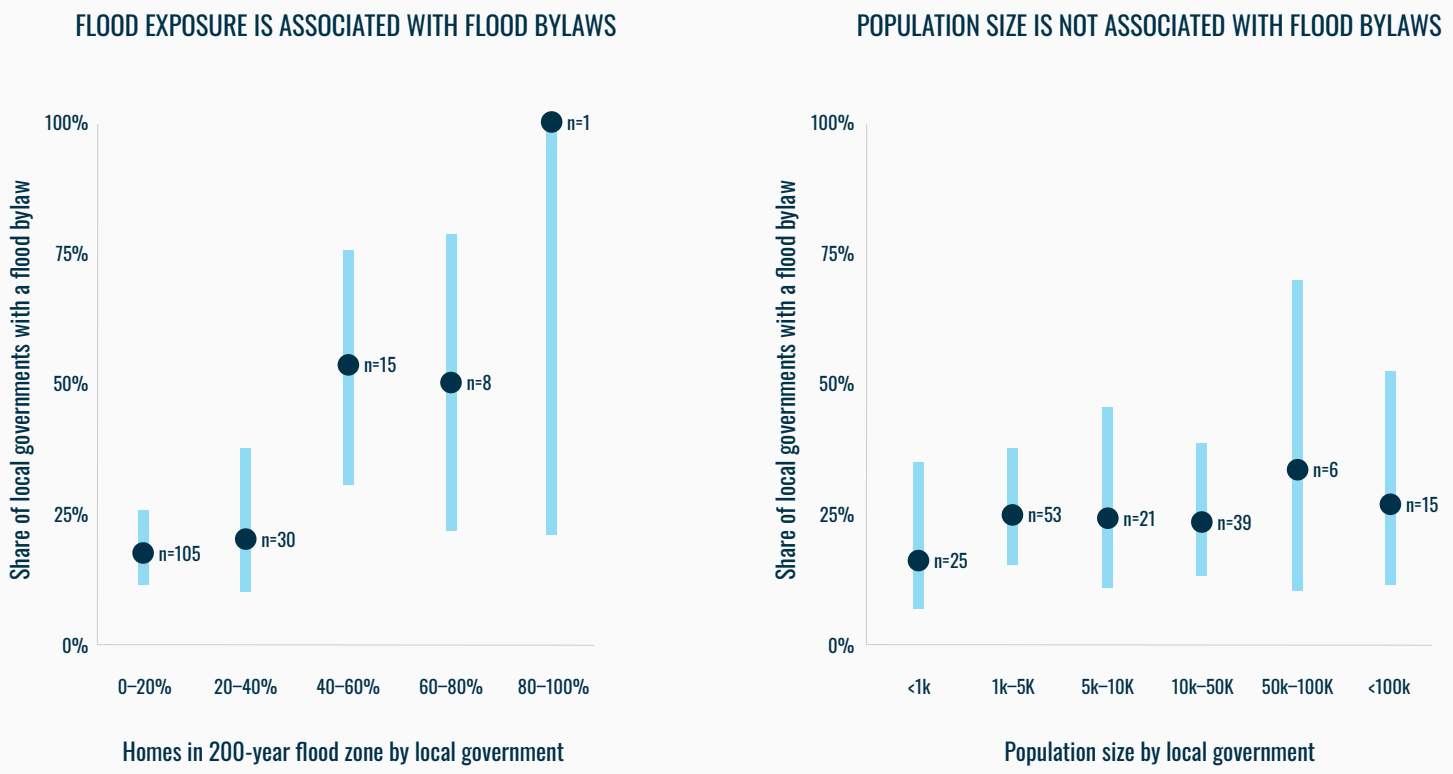
Development permit areas (DPAs)

DPAs that address hazards are widely adopted across B.C., potentially indicating that DPAs are a preferred regulatory tool by local governments. While the hazards covered and degree of implementation vary, 75 per cent of municipalities and 96 per cent of regional districts have at least one hazard-related DPA.

Some local governments integrate multi-hazard risk reduction alongside other priorities in DPAs.

Campbell River's OCP Bylaw 3475[32] has 11 general and specific DPAs that stack and regulate development in ways that simultaneously reduce risk and protect the environment for future generations—a city-wide priority. For example, development within the interface fire DPA requires a wildfire hazard assessment and mitigation plan by a professional, a report to protect sensitive ecosystems near the development by a professional biologist, and explicit emergency response provisions, such as fire breaks and trail systems. Penticton's OCP Bylaw 2019-08[33] includes one specific DPA that addresses risks from wildfires, flooding, and steep slopes, while simultaneously protecting the natural environment. Like Campbell River's DPA, Penticton's DPA requires both an environmental and hazard assessment and specific provisions to protect the development and environmentally sensitive and riparian areas.

FIGURE 6: ASSOCIATION BETWEEN FLOOD EXPOSURE, POPULATION SIZE, AND ADOPTION OF FLOOD BYLAWS AMONG MUNICIPALITIES



The left panel shows the share of municipalities with a flood bylaw across extents of flood exposure, measured as the percentage of homes located within the 200-year flood zone.[34] Points indicate the proportion of governments with a bylaw in each exposure category, and vertical lines show 95% confidence intervals. Sample sizes for each extent of flood exposure are displayed beside the points. Adoption rates increase with higher levels of flood exposure, indicating a positive association between flood risk and the likelihood of adopting a flood bylaw. The right panel shows the share of municipalities with a flood bylaw across population size categories. Points represent the proportion with a bylaw in each population bin, with 95% confidence intervals shown as vertical lines and sample sizes indicated. Adoption rates vary modestly across population categories and show no consistent trend, suggesting no meaningful association between population size and flood bylaw adoption.

These DPAs most commonly address slope hazards, followed by floods, wildfires, and coastal hazards (Figure 5). Adoption occurs across geographic regions, local government types, and population sizes, although the 25 per cent of municipalities without a DPA did have smaller population sizes. These DPAs represent an important baseline for climate resilience in municipalities across the province.

A smaller subset of municipalities uses DPAs to address multiple hazards. Of the 58 coastal municipalities, 10 per cent have DPAs that address all leading hazard types (wildfires, riverine floods, steep slopes, and coastal flooding). Fifteen per cent of B.C. municipalities have DPAs that address riverine flood, slope, and wildfire hazards.

DPAs provide a regulatory mechanism to embed evidence-based risk management practices into development approvals. However, uptake remains limited which may indicate that DPAs are not yet being systematically used to advance risk reduction objectives. Efforts to increase use of DPAs, compared with the baseline described in this report, represents an opportunity to gauge how legislation and programs support resilience planning at the municipal level.

Floodplain bylaws

Floodplain bylaw adoption across B.C. is piecemeal rather than systematic. Twenty-two per cent of municipalities and 41 per cent of regional districts have adopted floodplain bylaws.

These bylaws are present across most regions but absent in the Peace River Region.

Adoption increases with flood exposure, suggesting that clearly identified risk drives uptake (Figure 6). However, we did not assess the quality of the flood bylaws (e.g., if it restricts development in the highest risk places).

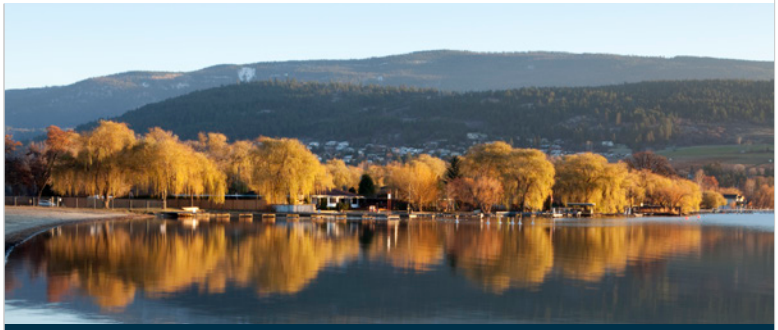
Flood-related DPAs are more widely used than floodplain bylaws (64 flood hazard DPAs compared to 37 floodplain bylaws) indicating a preference for site-specific regulatory tools over jurisdiction-wide standards. Among municipalities without a floodplain bylaw, 40 per cent include flood hazards as a consideration in a DPA. Nine per cent of municipalities have adopted both tools, combining jurisdiction-wide requirements and site-specific review.

Beyond DPAs and floodplain bylaws, some municipalities are working to mitigate risk with other policy tools. We did not do a comprehensive scan for all the cases but have identified examples: the City of Surrey's Zoning Bylaw[38] with floodproofing provisions such as setback requirements and minimum flood elevation and the District of Stewart's OCP,[39] which establishes setbacks for habitable portions of buildings within flood-prone areas.

Climate action plans and integrated approaches

Climate action plans are not yet a dominant tool for local land use governance. Thirty per cent of municipalities have climate action plans**. There are plans across most regions, but they are less common among smaller municipalities and in regional districts without an established RGS. This pattern suggests that coordination mechanisms and administrative capacity influence uptake.

Only a small subset of municipalities combines multiple tools in ways that reflect integrated approaches to climate risk and land use planning. Eighteen per cent of municipalities have both a hazard-related DPA and a floodplain bylaw, and seven per cent have adopted a DPA, a floodplain bylaw, and a climate action plan. While individual tools are common, systematic integration across regulatory strategic instruments remains limited.



Both flood DPAs and floodplain bylaws offer comprehensive coverage.

The City of Vernon has both a Floodplain Management Bylaw[35] and a flood hazard DPA[36] that work together to regulate development in the floodplain. The bylaw provides detailed requirements for flood construction levels, setbacks, and flood protection requirements, while the DPA enables additional safety considerations related to site design, form, and character. Vernon also has exceptional public resources on flood resilience and mapping (see Vernon's Flood Story[37]) which is likely a factor supporting their comprehensive approach to floodplain regulation.

Implications and opportunities

Adoption of key land use tools remains fragmented across B.C. Most local governments have adopted at least one hazard-related tool, but 20 per cent do not have a natural hazard DPA or floodplain bylaw. Uptake also varies by hazard type, geography, and local government size. Smaller municipalities and those in regional districts without a RGS are less likely to have adopted comprehensive tools.

Patterns we observed has also been documented by other studies.[45–47] Research shows that mandates, coordination, and sustained funding from senior governments increases uptake of climate-informed planning tools, while staffing and technical constraints remain persistent barriers, especially in smaller communities.[47–49] Although local adaptation policy seems to be increasing, the degree it systemically shapes land use decisions remains variable.[50]

** Climate action plans were included if they were stand-alone documents.

The patchwork of approaches means risk is addressed incrementally, discontinuously, and reactively across the province. It also creates inefficiencies and different levels of safety and protection across communities. This can result in higher long-term disaster losses, repeated public expenditures, and progressively fewer opportunities to avoid or reduce exposure.

The next section examines how these structural differences play out in practice, and how the current system contributes to downstream risk management and uneven outcomes.

3.4 How B.C.'s land use planning system functions in practice

System-level outcomes: The current land use planning system produces uneven and reactive management of climate risks.

As outlined in Section 3.1 and 3.2, the Government of B.C. has largely devolved land use planning to local government, leaving them to determine whether and how climate risks are integrated into decisions. Section 3.3 shows how this results in uneven adoption and piecemeal risk management across B.C.

Drawing on interviews and literature, this section examines five systemic challenges that limit consistent and proactive integration of climate risk in land use planning.

Case Study: Integrating climate risk into land use planning in the City of Kelowna

Approximately seven per cent of local governments reviewed demonstrate clear, integrated approaches to climate-informed land use planning. The City of Kelowna provides one example of this approach.

Kelowna is attempting to embed climate risk considerations across multiple planning instruments including their floodplain bylaw,[40] Natural Environment DPA,[41] and Wildfire DPA.[41] These regulatory tools are being updated to consider climate risks as new information or modeling is undertaken. For example, expanded floodplain mapping is being developed and policies relating to the Natural Environment DPA are being updated to reflect the impacts of wildfire on ecosystems and the need to consider natural regeneration as part of environmental assessments. These tools operate alongside broader strategic initiatives, including a Climate Vulnerability and Risk Assessment[42] and Climate Resilient Kelowna Strategy.[43] Their OCP also establishes a permanent growth boundary to promote urban densification, reduce vehicle dependence, and reduce development pressure on greenfield suburban areas. The Sustainable Urban Forest Strategy[44] focuses staff efforts on tree planting best practices to increase the longevity of the urban forest as the urban core densifies, to reduce the urban heat island effect.

The city continues to strengthen integration between climate policy and development decision-making. Kelowna has examined how to apply a formal climate lens to development applications and is exploring a climate scorecard to support Council decision-making. The proposed scorecard would assess alignment with priorities such as urban form and character, emissions reduction, and community liveability.

To address wildfire risk, Kelowna complements regulatory measures with community support programs. The city offers FireSmart assessments, funding for FireSmart activities, and offsets the costs for removing hedges and chipping through the Community Chipping Program. In February 2026, the city set requirements to follow FireSmart principles as part of all development permits, supporting best practices in wildfire resilience for new development.

Cross-departmental collaboration between climate, planning, fire, water quality, utility planning, and urban forestry departments has supported the city's ability to align land use decisions with climate risk reduction objectives.

Competing priorities and pressures

Local elected officials and staff have multiple, and sometimes conflicting, mandates. Climate risks, if considered at all, are weighed against housing needs, growth pressures, infrastructure needs, fiscal constraints, and voter expectations. Further, each local government's staffing levels and expertise, as well as fiscal resources further shape outcomes.

Local staff consistently described capacity and funding constraints:

> *"The risk is everywhere, and nobody has the money and the capacity to deal with it. ...we keep on passing the flood... costs onwards to society."*

Housing legislation emphasizes densification,[51] while emergency management legislation emphasizes risk assessments and hazard mitigation.[28] There are limited points of overlap or provincial direction on how to reconcile these mandates when they conflict. As a result, trade-offs are often resolved on a case-by-case basis, potentially at the expense of integrating climate risks:

> *"The onslaught of regulatory changes from the province has been really, really challenging for basically any other priority."*

While climate hazards may be identified in OCPs and addressed through enabling tools, there is no province-wide mandate to reduce risks through land use decisions. As one local staff member noted:

> *"We have no requirement to do more than identify hazards in the official community plan."*

Furthermore, without provincial standards to determine acceptable levels of climate risk, local governments must interpret whether identified hazards during a development application warrant denial, engineered protections or other risk mitigation, or conditional approval. A small number of jurisdictions have developed formal risk tolerance frameworks (e.g., District of North Vancouver[52] and Cowichan Valley Regional District[53]), but most rely on professional recommendations applied to individual applications, if they have hazard regulations at all.

This leaves outcomes highly dependent on local capacity, This leaves outcomes highly dependent on local capacity, funding, political will, and recent disaster experience:

> *"Local decisions makers at the council level are going to have a challenge making the hard decisions on this stuff unless they've maybe recently been through a big flood."*

Climate risks are considered late in the planning process

Existing tools encourage climate risk to be addressed later in the development process rather than through early jurisdiction-wide plans and focus more on natural hazards than risks related to extreme weather. DPAs, professional assessments, covenants, and exemptions typically occur after land has already been designated for development through OCPs and zoning.

These tools can reduce risk for individual parcels, but they do not necessarily reduce overall exposure across regions. Where OCPs designate development in or near hazardous areas, subsequent regulatory tools often focus on risk mitigation rather than avoidance.

One local staff member described this dynamic:

> *"Our planning really focuses on where not to build, rather than where to build... we get a flood and we build in the fire zone. We get a fire and then we go down and build in the flood zone."*

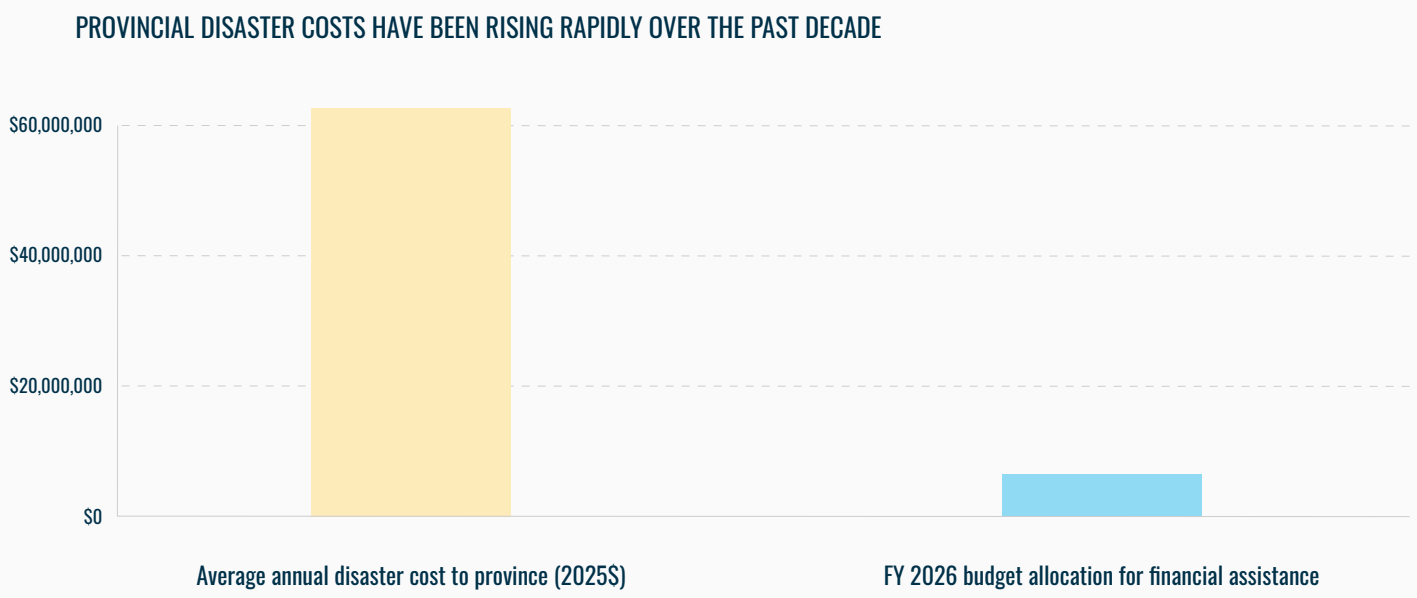
This pattern can lead to incremental accumulation of risk across regions and the province and pass liability and future costs downstream to governments and taxpayers.

Inconsistent hazard information

The availability, quality, and scale of hazard data vary significantly across B.C. Floodplain maps differ in age, modelling assumptions, and treatment of climate change projections.

In the absence of standardized provincial mapping and modelling guidance, local governments often rely on professional assessment commissioned for individual developments or on old datasets that may not reflect current or future conditions.

FIGURE 7: PROVINCIAL DISASTER COSTS FAR EXCEED CURRENT FINANCIAL ASSISTANCE BUDGET



Provincial disaster costs have outpaced budget allocations. Average annual disaster costs over the past decade substantially exceed the FY 2026 budget allocation for disaster financial assistance, highlighting growing fiscal exposure.[60] A review of financial statements shows that over the past decade every British Columbian has paid an equivalent of just over $100 in disaster assistance (indirectly through taxes).

As one local staff member explained:

> *"Different floodplain mapping projects [have no] standard for how you make assumptions about inflow, hydrology, how you develop your models, how you treat climate change."*

Provincial hazard platforms provide region-level information (e.g., Provincial Hazard Insights tool and the ClimateReadyBC platform), but their resolution is not granular enough for neighbourhood-level decision-making, let alone parcel-level.

Inconsistently available public information results in local governments developing to different risk assumptions across the province, reduces overall public risk awareness, and limit's reliability to use hazard information in land use decisions.

Risk and exposure in existing communities

Local governments are not starting from scratch. Many communities already have people, homes, infrastructure, and public assets in floodplains, high-risk wildfire areas, urban heat islands, and areas below sea level. In these areas, local governments have limited authority and tools to retrofit existing buildings to increase resilience. Instead, they often rely on protections (e.g., dikes or fuel management) to manage risk in existing neighbourhoods.[54, 55] These interventions require sustained technical capacity and long-term funding, which are often competitive and time limited. Insurance incentives exist but operate independently of development approvals.[56]

As one local staff member noted:

> *"[BC has a] well-built system for a hazard-based approach, but it isn't very good for communities built up in areas exposed to hazards."*

Measures that are more effective at reducing exposure over the long run, such as downzoning, property acquisition, or managed retreat, are politically sensitive, legally complex, and have a high upfront cost. These challenges are compounded by an extensive stock of end-of-life infrastructure and large capital costs for measures like flood protections[††].[55, 57, 58]

Past development decisions have not just locked in risk to homes, they also mean municipal infrastructure and public-private assets are exposed, as described by a local staff member:

> *"We have some properties where the sewer infrastructure is very much impacted by sea level rise and probably not put in the right spot to begin with. How do we future proof or improve that system overtime?"*

As a result, risk mitigation efforts are reactive and project-based rather than embedded within a predictable and coordinated framework.

Misaligned incentives and moral hazard

Public finance and private insurance markets play a significant role in shaping the incentives surrounding land use and climate risk. In B.C.'s land use planning system, hazard information, development approvals, insurance markets, and disaster assistance programs operate in silos instead of mutually reinforcing risk reduction strategies. Local governments shape long-term exposure, while the Province is responsible for large-scale disaster recovery costs. Insurance signals are generated through private markets and do not consistently feed back into planning frameworks. The result is a structural disconnect between risk creation and fiscal consequence.[49, 59]

Provincial disaster expenditures have increasingly exceeded annual budget allocations, underscoring growing fiscal exposure (Figure 7). As disasters have increased, public recovery spending has absorbed costs that, in part, were a product of land use decisions. This dynamic weakens incentives for local governments to avoid new exposure in high-hazard areas and contributes to a pattern of reactive expenditures rather than proactive risk reduction.

Insurance trends further illustrate these pressures. Rising premiums, coverage exclusions, and non-renewals in high-hazard areas reflect changing risk calculations within the private market.[61, 62] However, these signals are not systemically integrated into land use governance or provincial fiscal planning. As one local staff member noted:

> *"There are many people who are grossly underinsured and don't have an understanding of their insurance."*

Without stronger alignment between hazard information, planning decisions, insurance signals, and disaster financial assistance, risk management and recovery funding will continue to operate independently rather than reinforce one another. Over time, this misalignment increases long-term liabilities and costs to taxpayers.

Foundational building blocks

B.C. has many institutional and legal building blocks to support climate-informed decision-making. Provincial legislation enables local governments to regulate development in hazardous areas, require professional assessments, designate floodplains and development permit areas, and incorporate hazard considerations into official community plans. Emergency management reforms have strengthened requirements for risk assessment and hazard mitigation.

In the current system, the Province assumes that local governments will reduce exposure and protect their communities from climate impacts. While this is not a coordinated or sustainable strategy, where local governments have capacity and strong political will, sometimes post-disaster, they do use enabling tools to integrate climate risks into land use planning. Where tools are adopted, risk is more likely to be reduced. As one local staff member shared:

> *"We had a fire. Luckily, it hit a neighbourhood that had been recently developed and had to do wildfire mitigation as part of their subdivision application... they had a much more defensible forest... and firefighters were able to knock down the fire easily."*

[††] Devolution of flood management and dike responsibility to local governments has left some dikes below standard or completely unmanaged in the case of "orphan dikes." These dikes will likely not provide adequate flood protection in a changing climate and carry implications if communities continue to approve development behind them.59

Where adoption occurs, certain conditions are often present, including strong collaboration across planning, engineering, emergency management, and environmental departments; clear internal processes for incorporating hazard and climate information into development review; and a transparent communication that sets expectations up front with proponents. Regional collaboration, peer networks, and knowledge-sharing forums also support learning and consistency across jurisdictions (e.g., B.C. Climate Resilience Summit and Community Energy Association's Resilience Peer Network).

> *"When it comes to addressing wildfires, one of the biggest factors for success is the continuous collaboration we have between our Climate Action & Environmental Stewardship Department and our Fire Department."*

Overall, the challenge is not a complete lack of tools or thoughtful planning. The central issue is systemic alignment. The current framework provides a foundation. What is missing is clearer coordination between hazard information, planning direction, and financial incentives so that the system as a whole consistently reduces long-term exposure.

The following section outlines the core pillars required to strengthen that alignment and shift from reactive risk management toward a more durable, climate-informed land use planning system.

Learning from our neighbours:

Evidence from other jurisdictions point to clear practices and pillars that can support climate-informed land use decisions.

SECTION 4:

Shifting Toward a Climate-informed Land Use System

FIGURE 8: PILLARS AND CROSS-CUTTING PRINCIPLES FOR CLIMATE-INFORMED LAND USE PLANNING

Outside B.C., other governments also face similar challenges to make risk-informed land use decisions amid competing priorities of housing, affordability, and fiscal constraint.

By examining lessons from other jurisdictions, B.C. may find opportunities to address some of the challenges we describe in Section 3.4 and shift toward more a climate-informed land use system.

Evidence from other jurisdictions point to clear practices that support climate-informed land use decisions (Figure 8). The pillars and principles presented are based on leading evidence and have been implemented by jurisdictions that are similar to B.C. (Table 2). Together, these practices support land use decisions that are more consistent, defensible, and aligned with climate risk.

In this section we describe each pillar and the cross-cutting principles that underpin a climate-informed land use system, drawing on examples from other jurisdictions. We then compare each pillar to opportunities in B.C.'s land use system.

4.1 Pillar 1: Accessible and decision-relevant climate hazard information

Land use decisions must be informed by accessible, decision-relevant climate hazard and risk information. Governments, practitioners, and the public require clear, usable data to identify where climate hazards exist and to integrate the information into planning and investment decisions.[63]

There is strong evidence that usable risk data is path-critical for climate-informed land use planning.[10, 64–68] Further, climate risk information should be publicly accessible and usable at the parcel-level.

We identified three best practices to support evidence-based land use decision-making:

1. **Publicly available and parcel-level hazard data are foundational for land use decisions and the public good.** Decision makers and the public need information about the presence of hazards. This information supports transparent designation of hazardous areas and development regulations.

TABLE 2: OVERVIEW OF PILLARS AND SUPPORTING EXAMPLES

Pillar	Best practice	Example jurisdictions
Pillar 1: Accessible and decision-relevant climate hazard information	Publicly available and parcel-level data	California, New Zealand, Oregon, Quebec
	Real estate and rental disclosure	California, New Zealand, Oregon, Quebec
	Accessible resources	California, New Zealand, Oregon, Quebec
Pillar 2: Clear, coordinated, risk-informed decision-making	Coordination and alignment	California, New Zealand Oregon, Quebec
	Clear direction for regulations	California, New Zealand, Ontario, Oregon, Quebec
	Guidance and capacity	California, Ontario (via Conservation Authorities), Oregon, Quebec, New Zealand
Pillar 3: Alignment between vision and incentives	Disaster recovery instruments linked to incentives	California, Oregon, Quebec
	Ongoing risk reduction incentives and funding	California, Oregon, Quebec

Recent analyses emphasize the importance of federal and provincial leadership in developing and maintaining hazard maps either through direct provision or, at minimum, through clear technical guidance that supports consistent local application.[10, 49, 55]

2. **Mandatory real estate and rental hazard disclosures support efficient market signals and individual choice.** Disclosure requirements ensure that renters and buyers receive hazard information at the point of sale.[49, 61, 69, 70] When combined with information on historical property damage, disaster assistance, and insurance claims, mandated disclosure is intended to reduce information asymmetry, allow buyers and renters to price risk into their decisions, improve market efficiency, and encourage risk-reduction behaviours.[59, 69] Public access to standardized maps can also help ensure quality, transparency, and consistency in the flood insurance market.[69]

3. **Publicly available hazard information is paired with accessible resources and education.** Accessible and comprehensive resources that accompany mapping and disclosure requirements help decision makers and the public interpret risk information, understand how the information was developed, and can improve their ability to act on the insights.[10, 69] Transparency and education can also help quell concerns about the legal and political implications of publicly available information, especially related to property value.[71, 72]

The Province has taken some recent steps to improve how climate and hazard information is provided to support local governments and the public. The Province has partnered with the federal government to advance flood mapping in high-risk communities through the federal Flood Hazard Identification and Mapping Program (FHIMP).[90] Final or draft floodplain maps have been shared with 81 communities across the first seven study areas, and four additional projects are underway or nearing award. Beyond floodplain mapping, regional hazard and exposure information exists on provincial hazard data platforms (e.g., Provincial Hazard Insights tool), but their resolution is not currently able to guide parcel-level land use decisions.

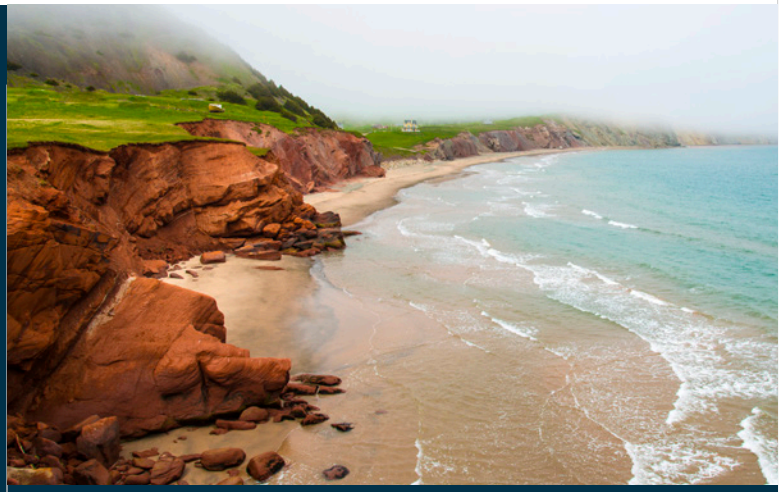
Other jurisdictions offer examples of centralized public hazard and risk information

Outside B.C, governments support climate-informed land use planning by making parcel-level hazard and climate risk information publicly available and usable for local decisions.[73] This information helps governments, practitioners, and the public understand where climate hazards exist and factor risk into planning, development, and investment choices.

Quebec publishes landslide and coastal erosion maps[74] and is updating their flood mapping program[75] with new province-wide risk-based flood maps intended to be usable at the parcel-level. Ontario takes a decentralized approach. The Province sets technical guidance for floodplain mapping[76] and wildland fire risk assessment,[77] while Conservation Authorities independently produce hazard information to support municipal planning and development decisions.

In the United States, hazard information is coordinated across governments to support consistent local use. The Federal Emergency Management Agency (FEMA) provides flood hazard data and maps, a national risk index, and technical guidance used by states and municipalities.[78] Oregon supports local governments in identifying hazards and risks for Natural Hazard Mitigation Plans,[79] while California provides accessible wildfire, flood, and climate vulnerability maps to support land use and investment decisions.[80–82]

Some national governments utilize arm's-length independent bodies to produce information, support evidence-based decision-making, and insulate from political cycles. New Zealand's independent government entity, the Natural Hazards Commission, hosts a national natural hazards portal[83] that includes both regional and parcel-level hazard and risk maps, information on past events, and historical insurance and disaster assistance claim data. Jurisdictions including England, the United States, and the Netherlands utilize independent statutory bodies to conduct climate-related research, risk assessment, and provide advice on policy to respective governments.[84–86]



A handful of jurisdictions also use hazard disclosure to ensure that risk information reaches buyers and renters at the point of sale. Quebec is currently the only Canadian province that requires flood risk disclosures.[87] California requires sellers to disclose whether properties are exposed to key hazards,[88] and Oregon includes hazard information in standard property condition reports.[89] As of 2025, New Zealand expanded its disclosure framework to require Regional Councils to provide hazard information to support local disclosures.[73]

4.2 Pillar 2: Clear, coordinated, risk-informed decision-making

Pillar 2 focuses on how climate risk information is turned into clear, coordinated land use decisions. While local governments are responsible for land use planning, senior governments play a critical role in setting expectations, aligning policies, and providing guidance that enables climate risks to be addressed early, consistently, and transparently.

International frameworks and national strategies emphasize that effective disaster risk reduction depends on coordinated, whole-of-government approaches.[65–68] While these frameworks are not specific to land use, they consistently highlight the importance of clear roles across governance levels, senior government leadership, shared objectives, and sustained capacity-building to support local implementation. The literature reviewed similarly highlighted roles, leadership, objectives and capacity building.[10, 63, 64, 91]

Across the literature and case studies, three best practices emerge:

1. **A coordinated framework for climate risk and land use creates alignment and shared direction.**
   Effective systems align land use, housing, climate adaptation, and emergency management objectives across government. While responsibilities may be distributed, senior governments provide an overall direction that clarifies how climate risks should be considered alongside other public priorities. Productive linkages between national, regional/provincial, and local governments reduce ambiguity and help ensure that climate risks are addressed consistently rather than negotiated case by case.[10, 63, 64]

2. **Clear direction to regulate development in hazardous areas reduces exposure and long-term risk.**
   Regulating development in hazardous areas and restricting development in the most hazardous areas is core to reducing exposure.[10, 49, 92] Many jurisdictions use a combination of regulation and guidance to steer new development away from the most hazardous areas and to link land use patterns with long-term risk reduction. Higher orders of government play a key role by setting criteria or expectations that clarify when and how risk should be limited while allowing local governments to implement stricter bylaws as needed.[10]

3. **Strong guidance and capacity across the system support implementation.**
   Clear expectations are supported by technical guidance, funding, and institutional capacity.[61] Senior governments typically provide tools, training, and expertise to help local governments integrate climate risks into planning and development decisions.[64] Where this support is strong, local governments are better positioned to apply risk information consistently and defensibly.

   The Province has shown strong leadership in both land use and climate policy areas. Emergency management reforms emphasize climate-informed risk assessments, hazard mitigation, and specific consideration for vulnerable groups and those experiencing intersectional disadvantage.[28] The B.C. Flood Strategy[101] includes many provincial and local actions related to reducing flood risk through land use planning. Recent housing legislation signals the Province is willing to intervene when something is a provincial priority. However, formal mechanisms for coordinating across provincial policy areas of land use, emergency management, housing, and climate adaptation remain limited.

Clearer direction enables consistent local land use decisions in other jurisdictions

Across all case studies, senior governments retain authority over land use frameworks while delegating implementation and decision-making to local governments.[63] This delegation is paired with clear expectations about climate risk. For example, Quebec regulates development in coastal and riverine flood zones and is transitioning to a risk-based flood zoning system[75] that links land use permissions with risk levels. Ontario directs development away from hazardous areas through floodplain regulations,[93] and a provincial planning statement[94] that local governments must conform with. New Zealand uses National Policy Statements[95] and technical guidance to consider hazards and risk tolerance[96] for new development, and they are actively overhauling their planning and environmental management system to streamline growth while managing risks.[96]

In the United States, state governments play a strong coordinating role. Oregon requires local governments to prepare Natural Hazard Mitigation Plans as part of a statewide land use planning system[97] and to be eligible for funding, while California sets minimum requirements[98] for integrating climate risks into local plans, including vulnerability assessments and adaptation goals. Research shows that minimum standards and early integration requirements are associated with higher-quality hazard mitigation planning.[99]

Senior governments also provide targeted support. For example, in both Quebec and Ontario, regional county municipalities and Conservation Authorities, respectively, are mandated to identify hazards and support local planning and development decisions. U.S. states such as Oregon provide training and capacity-building for local planners and officials to support consistent application.[100]

4.3 Pillar 3: Alignment between vision and incentives

Pillar 3 focuses on aligning land use decisions with financial incentives that support long-term risk reduction. While hazard information and planning frameworks are essential, land use outcomes are strongly shaped by market conditions, including disaster recovery funding and insurance availability.

Evidence shows that reducing disaster risk requires changing incentives over time.[49,59,66] Priority Four of the Sendai Framework emphasizes "build back better" after disasters and explicitly identifies land use planning as a tool to reduce future risk during recovery. National and provincial strategies similarly highlight the importance of aligning recovery, insurance, and mitigation funding with long-term risk reduction objectives.[62,67,101]

Two best practices consistently emerge to align market signals and policy objectives:

1. **Disaster recovery instruments linked to land use decisions incentivize risk reduction.**
   Linking disaster financial assistance eligibility to land use decisions is an emerging best practice.[10,62] Clear eligibility rules can reduce repeated public spending on avoidable losses. This can also help shift land use patterns over time, while still protecting vulnerable households and legacy development.

2. **Strong incentives and funding support ongoing risk reduction for existing developments and neighbourhoods.**
   Effective systems pair restrictions with positive incentives, including funding for hazard mitigation, relocation where risk is extreme, and community-level investments such as flood protection or wildfire risk reduction.[10,62,64] Insurance is often used to reinforce these incentives by rewarding risk reduction actions and signaling where risk is becoming increasingly difficult to manage.

   The Province already has a model for linking financial mechanisms to climate-informed land use decisions. Funding eligibility for both the Community Emergency Preparedness Fund[111] and Disaster Resilience and Innovation

Across the case studies, senior governments are working to better align land use decisions with financial incentives

In Canada, recent reforms to the federal Disaster Financial Assistance Arrangements (DFAA) have narrowed eligibility for assets built in high-risk areas unless they are appropriately mitigated, place greater emphasis on building back better, and create risk reduction incentives.[102] While these changes can be contentious in practice, they signal an effort to reduce moral hazard and repeated losses, consistent with research on effective disaster risk reduction.[10, 64]

Quebec is well aligned with this approach. The Province limits financial assistance for homes built in the floodplain after regulations are in place, excludes homes built in 1:20 year flood zone[103] from assistance, and caps total assistance[104]. In contrast, Ontario applies a maximum cap on assistance but does not explicitly link eligibility to land use regulations or risk reduction requirements.[105]

In the U.S., disaster funding and insurance are more directly tied to risk reduction actions. FEMA's National Flood Insurance Program[106] links insurance availability to adoption of floodplain regulations that meet federal standards. Insurance premiums increasingly reflect full risk, while discounts are available[107] for both community level and individual mitigation measures. States such as California[108] and Oregon[109] require approved hazard mitigation plans as a condition for accessing FEMA funding before and after disasters, reinforcing early planning and risk reduction.

New Zealand relies on a public-private hazards insurance program that provides capped first loss insurance for many hazards and is required for some homes.[110] While this system supports recovery, it does not strongly incentivize risk reduction or land use changes, illustrating the limits of insurance mechanisms when not linked with explicit policy direction.

Program[112] is based on adherence to provincial guidance (e.g., Flood Hazard and Land use Management Guidelines) and not intended to promote new development in high hazard areas. These types of linkages provide significant signals and incentives for local governments and could be replicated as the provincial Disaster Financial Assistance program gets updated in response to federal reforms.

4.4 Cross-cutting principles

The following cross-cutting principles guide how the pillars should be designed and implemented. Together, they are intended to ensure that climate-informed land use planning in B.C. is legally sound, context-sensitive, and attentive to potential disproportionate impacts.

Uphold Indigenous Rights and Title

Indigenous Peoples are disproportionately affected by climate change and hold deep place-based knowledge, governance systems, and stewardship practices that support effective climate adaptation. Recognizing and upholding the Rights and Title of First Nations in B.C. is a legal obligation grounded in Canadian constitutional law and affirmed through multiple Supreme Court of Canada decisions (Box 1).

Across jurisdictions reviewed, senior governments increasingly require or encourage Indigenous involvement in land use planning and climate-related initiatives. New Zealand provides one of the most integrated examples, where Māori-led climate and land use policies flow from nation-to-nation relationships and are reflected in implementation at local scales.[63] There is also strong evidence from research across B.C. and Canada that integrating Indigenous Knowledge systems and communities in the design and implementation of local planning enhances durability and effectiveness.[113–116]

In B.C., collaboration between local governments and First Nations is occurring in emergency management, watershed governance, cultural and prescribed burning, archaeological assessments, and flood mitigation. However, formal guidance, resourcing, and consistent processes to support First Nations' participation and shared decision-making in climate-informed land use planning remain underdeveloped.[54] (§NR83 and EB52) As First Nations continue to assert governance authority over their territories, the Province should seek clear approaches for coordination and decision-making for local governments that reflect Indigenous Rights and Title and consistency with evolving jurisprudence and DRIPA.

Respect the range of local contexts and governance capacities

Local governments are on the front lines of land use planning and climate risk management, operating across diverse landscapes, hazards, populations, and institutional capacities. Effective climate-informed land use planning should therefore be generally responsive to local conditions and community needs while providing sufficient clarity and support from senior governments.

International frameworks and national plans consistently emphasize empowering local governments while providing clear guidance, data, and coordination to address disaster and climate risks.[65, 66, 68, 91] Jurisdictions reviewed take different approaches. For example, New Zealand provides detailed top-down guidance and hazard data to support local implementation, while Ontario combines provincial direction with watershed-based Conservation Authorities that enable regional coordination. Quebec, by contrast, delegates significant responsibility to local governments with more limited requirements for consultation or alignment.

B.C.'s system sits between these approaches. With local governments facing varied hazards and capacities, experience from recent housing and emergency legislation suggests that provincial direction is most effective when it provides clear expectations and processes, paired with flexibility, resourcing, and technical support. Implementing the pillars will therefore require sustained collaboration between federal, provincial, and local governments, with particular attention to the needs of small, rural, and high-risk communities.

Account for the disproportionate impacts

Climate disaster and land use planning decisions can have disproportionate impacts on renters, low-income households, the elderly, racialized communities, and small or rural communities.

These considerations are distinct from, and complementary to, the constitutional obligations related to Indigenous Rights and Title discussed above. Without deliberate attention, climate-informed land use policies may unintentionally exacerbate existing inequities.

Research and practice show that disproportionate impacts can arise at all stages of climate-informed land use planning, from hazard mapping and disclosure to development regulation and disaster recovery.[49, 102] For example, public hazard disclosure can create challenges for households with limited ability to relocate, retrofit, or absorb rising insurance and housing costs.[69, 117] Across jurisdictions, the degree that senior governments account for disproportionate impacts varies.

Jurisdictions such as Oregon and California have responded by embedding equity and environmental justice considerations directly into climate and land use policy frameworks.

In B.C., attention to disproportionate impacts is increasing. Recent emergency management legislation requires risk assessments to consider impacts on vulnerable populations and those experiencing intersectional disadvantaged.[28 (§51(3)(b)(i)))] Applying this lens consistently across the design and implementation of each pillar, and doing so in collaboration with affected communities, will be necessary to ensure that climate-informed land use planning reduces risk without deepening inequities.

Securing our future, together:

Climate-informed land use planning can help address climate risk while also supporting housing objectives, cost of living considerations, and long-term fiscal sustainability to create stronger and more resilient communities in the long term.

SECTION 5:

Policy Pathways and Recommendations

B.C.'s land use planning system includes many of the components needed for climate-informed decision-making. However, these components are applied unevenly across the province. As a result, exposure to climate hazards continues to grow, making it more difficult to reign in housing affordability, cost-of-living pressures, and balance budgets.

B.C. now faces a significant opportunity to integrate climate risks into land use decisions before more people, homes, and infrastructure are put in harm's way. Climate-informed land use planning can help address climate risk while also supporting housing objectives, cost-of-living considerations, and long-term fiscal sustainability. Achieving this shift will require clear leadership and sustained commitment.

This section translates findings from Section 3 and the pillars outlined in Section 4 into a set of focused recommendations to build on key opportunity areas in B.C.'s current land use system. These recommendations strengthen land use decisions by improving risk information, clarifying planning and risk frameworks, and aligning financial incentives.

5.1 Recommendations

Pillar 1: Accessible and decision-relevant climate hazard information

RECOMMENDATION 1.1:
Develop standardized climate hazard information to support clear market signals and protect constituents

B.C. needs an an arm's-length body to develop, maintain, and publish standardized climate hazard information. This body should have operational and publication independence.

This body's mandate should be limited to producing and maintaining authoritative, decision-relevant hazard information. It should consolidate existing mapping efforts, apply consistent provincial methodologies, and publish climate hazard information at a scale to support parcel-level decisions.

Institutional separation between hazard information and land use approval decisions would clarify roles, strengthen defensibility, and reduce incentives to delay or alter publication for political or financial reasons. Separating assessment from approval supports public trust, improves consistency over time, reduces liability exposure associated with perceived conflicts between hazard disclosure and development decisions.[118–120] B.C. uses similar governance structures for property value assessments and public health guidance, while the Government of Canada uses independent governance for public health and nuclear safety.[121, 122]

Fiscal considerations and implementation

Over the long run, implementing climate-informed land use planning likely does not require significant new public spending. Instead, our recommendations focus on reallocating existing resources, clarifying decision-making frameworks, and reducing future fiscal liabilities.

Under the current system, governments already bear growing and volatile costs associated with disaster response, recovery, rebuilding, and infrastructure repair. Many of these costs arise from development decisions that increase exposure to climate hazards and commit governments to long-term obligations before budgets are allocated. The status quo is not fiscally neutral; it embeds rising and uncertain future liabilities.

The proposed policy pathways shift emphasis upstream by improving the efficiency, consistency, and timing of land use decisions. Several recommendations rely primarily on policy direction, standard-setting, and coordination across government, rather than new funding programs. Others could be funded by consolidating existing hazard and risk mapping efforts, reducing duplication of site-specific studies, and tying disaster assistance to risk-reduction objectives.

Where targeted support is required, particularly for small, rural, or high-risk communities, costs should be weighed against the long-term fiscal benefits of reduced disaster losses and more predictable public expenditures. Overall, the recommendations are designed to improve fiscal sustainability by reducing avoidable future costs rather than increasing near-term spending.

Responsibility for land use regulation and development approvals should remain with local and provincial governments—informed, but not directed by published hazard information.

Design considerations:

- **Institutional independence:** The body should have operational and publication independence, including a statutory duty to publish hazard information, transparent methodological authority, and conflict-of-interest safeguards. Various similar models are used in England, the United States, and the Netherlands.[84–86]
- **Phased hazard prioritization:** Initial efforts should focus on hazards with the strongest evidence base and highest relevance for land use planning (e.g., flooding), with additional hazards incorporated over time.
- **Transparency and uncertainty:** Published information should clearly document data sources, assumptions, confidence levels, and update cycles to avoid false precision and support appropriate use.
- **Scalability and consistency:** Hazard information should be produced using consistent methodologies across the province, while allowing updates as science and data improve.
- **Cost containment:** Consolidating existing mapping efforts can reduce duplication and inefficiencies. Further, a central source for parcel-level hazard information would improve cost-effectiveness of risk assessment efforts.

RECOMMENDATION 1.2:
Introduce standardized public disclosure requirements for climate hazard exposure in real estate and rental transactions

B.C. needs standardized disclosure of climate hazard exposure in real estate and rental transactions, using existing regulatory and administrative processes.

To achieve this, the Province could amend the Real Estate Services Act[123] to establish clear, province-wide disclosure obligations applicable to licensees and sellers, and amend the Land Title Act[13] to enable standardized, property-linked identification of designated climate hazard areas. Any amendments should ensure that disclosure is based on authoritative province-wide hazard information and applied consistently across transactions.

At a minimum, disclosure should indicate whether a property is in a designated climate hazard area, relies on engineered protection measures, or is subject to covenants, DPA exemptions, or conditions related to climate hazards. Disclosure requirements should draw on standardized hazard information produced by the designated independent entity and be accompanied by accessible public guidance to support interpretation.

Disclosure should be implemented in a phased manner and designed to improve transparency and risk awareness without misrepresenting risk or disproportionately disadvantaging vulnerable households.

Design considerations:

- **Standardization:** Disclosure requirements should be uniform across jurisdictions to avoid inconsistent application or selective disclosure.
- **Clarity of scope:** Disclosure should focus on clearly defined indicators (e.g., hazard designation, reliance on protective infrastructure, covenants, or exemptions) rather than subjective risk scoring.
- **Phased implementation**: Requirements should be introduced in stages to allow time for public engagement and education, administrative adjustments, and data maturation.
- **Equity safeguards:** Disclosure should be paired with accessible public guidance to avoid disproportionate impacts on vulnerable households.
- **Administrative efficiency:** Disclosure should be integrated into existing processes to minimize compliance burden and duplication.

Pillar 2: Clear, coordinated, risk-informed decision-making

RECOMMENDATION 2.1:

Align provincial mandates to support consistent, risk-informed land use decisions

Ministry mandates and policy direction need to be aligned to ensure that land use planning, housing delivery, emergency management, climate adaptation, and reconciliation objectives are mutually reinforcing.

This should include clearly articulating how climate hazard and risk considerations are to be weighed alongside housing supply, growth, and infrastructure priorities in provincial guidance, policy statements, and funding programs. Improving alignment across ministries can reduce conflicting signals to local governments, lower administrative and political burden, and support more predictable and defensible land use decisions.

Design considerations:

- **Clear accountability:** Action should clearly identify responsibility for coordinating land use, housing, emergency management, and climate adaptation objectives across ministries.
- **First Nations consultation:** Clear processes and guidance for local government and First Nations consultation on climate-informed land use planning is needed and should build on related processes (e.g., EDMA Indigenous Engagement Requirements[124]). This guidance should be developed with First Nations.
- **Whole-of-lifecycle decision-making:** Cost–benefit analysis could be used to inform provincial policy direction and funding decisions to account for long-term public liabilities, including repair, recovery, and replacement costs associated with climate hazards, alongside other social, environmental, and housing needs, where possible.
- **Balanced targets and indicators:** Provincial targets, performance indicators, and accountability mechanisms, particularly those related to housing delivery and infrastructure, should explicitly consider climate resilience and exposure reduction alongside supply and growth objectives.
- **Consistent signals:** Provincial guidance, policy statements, and funding programs should reinforce risk-informed land use decisions.
- **Integration at decision points:** Alignment should be reflected at key decision stages, including housing targets, infrastructure funding, and planning approvals.
- **Reduced administrative burden:** Clearer alignment can lower transaction costs for local governments by reducing the need to reconcile conflicting provincial objectives.
- **Monitoring and feedback:** Periodic review can help ensure alignment remains effective as policies and risks evolve.

RECOMMENDATION 2.2:

Ensure local governments have clear direction to regulate development in hazardous areas

B.C. should build toward consistent standards and practices for local governments to regulate development in hazardous areas, earlier on in their land use planning processes.

This direction should clarify minimum expectations for when development should be restricted, conditioned, or allowed based on hazard severity and risk, while allowing local governments to adopt stricter approaches to reflect local context. Integrating this direction at the OCP stage can help reduce reliance on ad hoc, site-specific decision-making and professional discretion later in the development process.

Clear direction can help local governments steer new development away from the highest-risk areas, improve consistency across jurisdictions, and reduce the creation of new exposure to climate hazards over time.

Design considerations:

- **Phased approach:** Direction should be introduced in stages, beginning with guidance based on data from Recommendation 1.1 and engagement with local governments. Direction could then evolve to minimum expectations and then clearer standards as hazard information and adoption improve. Further analysis could also include an analysis of the efficacy of adopted tools, explore other methods being used to address hazards and risks, and further examine factors that contribute to policy adoption across the province.
- **Early clarity on risk tolerance:** Initial phases should establish shared expectations for acceptable risk, including when development should be restricted, conditioned, or subject to additional requirements. This should be informed by technical expertise, in collaboration with local governments to consider economic and housing trade-offs.

- **Planning-level integration:** Early direction should clarify how climate hazard and risk information is expected to inform jurisdiction-wide strategic plans (e.g., OCPs, zoning bylaws, and climate action plans), rather than being applied primarily at the site level.
- **Baseline consistency with local flexibility:** Guidance should establish common minimum expectations while allowing local governments to adopt stricter approaches based on local conditions.
- **Prospective application:** Standards should apply going forward, with specific approaches for managing risk in existing neighbourhoods.
- **Public engagement and capacity-building:** Public engagement, capacity-building, social mobilization, and training programs should be developed to support community buy-in and increase resilience. This could build on and scale successful models in B.C. (e.g., Youth Climate Corps, Oak Bay Coolkit programs, Building Resilient Neighbourhoods).

Pillar 3: Alignment between vision and incentives

RECOMMENDATION 3.1:

Reform disaster financial assistance to discourage new exposure to climate hazards

B.C.'s disaster financial assistance eligibility rules should exclude both new development and rebuilding without risk mitigation in clearly identified high-hazard areas.

Eligibility changes should apply to development approvals issued on or after the date the policy is announced. New development approved in high-hazard areas after that date should not be eligible for disaster financial assistance, except where defined risk-reduction standards are met. Rebuilding high-hazard areas should not be eligible unless it is done with appropriate risk mitigation.

Disaster financial assistance should continue to support people affected by disasters in existing communities. Where households are identified as vulnerable, support should be targeted to risk reduction, relocation, or recovery from past exposure, not to the creation of new risk. Disaster financial assistance should be linked to risk reduction incentives (e.g., adoption of specific climate-informed land use tools).

Clear, forward-looking eligibility rules can reduce pressure on local governments, discourage last-minute approvals, and limit future public costs from avoidable losses.

Design considerations:

- **Disproportionate impact lens:** Policy details should be informed by analysis of potential disproportionate impacts.
- **Implementation approach:** Implementation of this recommendation would occur after Recommendation 1.1 is implemented and hazard data is publicly available.
- **Immediate effective date:** Eligibility changes should apply to development approvals issued on or after the public announcement date to avoid last-minute approvals and strategic legacy protections.
- **Clear definition of "new development":** Guidance should clearly define what constitutes new development or redevelopment for eligibility purposes, including floorplan expansions that materially increase exposure.
- **Targeted support for vulnerable households and existing exposure:** Disaster financial assistance should continue to support households and communities affected by disasters in existing developed areas, with priority given to recovery, mitigation, or voluntary relocation.
- **Alignment with land use approvals:** Eligibility rules should be explicitly linked to land use approval decisions so that responsibility for risk creation and responsibility for recovery is not misaligned.
- **Consistency with federal programs:** Eligibility changes should be coordinated with federal disaster assistance frameworks to avoid mixed signals and unintended gaps.

RECOMMENDATION 3.2:

Use insurance market signals to inform climate risk governance

Insurance market signals are an important indicator for decision makers. Decision makers should monitor changes in insurance availability and affordability, such as coverage exclusions, non-renewals, and rising premiums, as part of their internal understanding of climate-related risk and exposure. Insights generated through oversight could inform cross-government climate risk governance.[125]

These indicators should be used as internal early warnings to help governments identify where land use patterns, hazard exposure, or development decisions may be creating growing risks for households and public systems.

Insurance signals should complement hazard and risk assessments by highlighting where current land use patterns may be contributing to rising or unmanageable risk.

This information should be used for internal policy and planning purposes only. It should not be publicly disclosed or used to influence insurance pricing or underwriting decisions.

Design considerations:

- **Public-interest purpose:** Insurance-related information should be used to understand impacts on households, communities, and public finances. This aligns with government climate adaptation responsibilities and B.C. Financial Services Authority's (BCFSA) consumer protection and regulatory oversight roles.
- **Aggregate, non-identifying information:** Monitoring should rely on aggregated, anonymized, and place-based data rather than insurer-specific or property-level information to protect confidentiality and commercially sensitive information.
- **Bounded interpretation:** Insurance signals should be interpreted as indicators of potential stress or emerging risk, not as definitive measures of hazard, insurability, or appropriate land use outcomes, recognizing the influence of market cycles and reinsurance conditions.
- **Integration with risk oversight processes:** Insurance market trends could be incorporated into existing internal risk assessment, supervisory briefings, and cross-government coordination processes, informed by BCFSA's regulatory insights and alongside hazard mapping and other climate risk information.

5.2 Conclusion

Together, these recommendations reorient B.C.'s land use planning system toward a more climate-informed and cost-effective approach. Their implementation should be guided by cross-cutting principles that include:

- **Principle 1:** Upholding Rights and Title
- **Principle 2:** Respect local contexts and governance capacities
- **Principle 3:** Account for disproportionate impacts

While individual recommendations emphasize different principles, these considerations are intended to be applied consistently across all pillars. Integrated in this way, the recommendations build on existing practices, strengthen decision-making over time, and support an adaptive approach to land use planning as climate hazards and community needs continue to evolve.

The recommendations we provide are intended to support an initial transition toward more climate-informed land use planning. The first phase focuses on improved coordination, provincial leadership and direction, transparency, and clear processes and support for local governments and the public. As risk disclosures improve and disaster financial assistance rules become clearer, market responses will provide important signals about where risk is being reduced and where exposure continues to grow. Over time, the system should be reviewed and adapted as needed.

Land use planning offers governments an opportunity to make choices about where and how communities change and develop in ways that promote resilience, safety, and long-term affordability. As climate, housing, and the cost of living bear down on decision makers and their communities, now is the time to make climate-informed decisions before development and climate risk are locked in for years to come. While there is no single pathway, starting to reorient the land use planning system in B.C. to avoid climate risk, in collaboration with local governments, First Nations, and other actors, will create stronger and more resilient communities in the long term.

Glossary

Adaptation: The process of adjusting to expected or actual climate change impacts. For human systems this process may include plans and actions that moderate adverse consequences and/or take advantage of emerging opportunities.[126]

Climate change: A shift in the average conditions and variability of a climate and its properties in a specific place, over an extended period (several decades or more). While climate change can be attributed to natural internal processes, the rapid increase in global temperature over the last 100 years have been attributed to human activities that alter the global atmosphere.[126]

Disaster: Substantial disruptions to a community or society that occur when hazardous events interact with conditions of exposure, vulnerability, and adaptive capacity, and cause human, material, economic and environmental impacts and losses.[127]

Disaster risk reduction: The process of preventing new and reducing existing disaster risk and managing residual risk that cannot be fully prevented.[126]

Emergency management: The process of preparing for, responding to, and recovery from disasters. In British Columbia, emergency management is guided by four pillars: mitigation, preparation, response, and recovery.[128]

Exposure: The presence of something of value located when and where a hazard may occur.[126]

Hazard: A natural or human-caused process or event that may result in adverse consequences. Climate hazards are hazards influenced by climate change (e.g., wildfire, drought, extreme heat, floods) that may become more frequent and severe over time.[68]

Land use planning: Planning of land, resources, facilities, and services while considering and securing the physical, economic and social efficiency, and health and well-being of urban and rural communities.[129]

Mitigation: An intervention to reduce greenhouse gas emissions or enhance sinks.[126]

Moral hazard: A person, organization, or government decides how much risk to take, but someone else bears the financial consequences of that risk. For example, disaster financial assistance from senior governments can discourage local governments from investing in risk mitigation.[49]

Resilience: The ability for human and natural systems to cope with climate change in ways that maintain their essential function, identity, and structure. Climate resilience can be positive when it promotes adaptation, learning, and transformation and may look different across distinct communities and for specific hazards.[126]

Risk: The potential for adverse consequences for human or natural systems, recognizing the diversity of values and objectives associated with such systems.[126] Climate risk refers specifically to risk arising from climate-related hazards. Disaster risk includes hazards that are geophysical, biological, environmental, hydrometeorological, and technological. In the context of risk assessment, risk results from the interaction between hazards, exposure, and vulnerability, considering likelihood and consequence of the risk.

Risk assessment: The practice of identifying and prioritizing risks to a system by considering how likely a risk event is (likelihood) and the consequences of the risk event.[126]

Risk tolerance: The willingness to accept or reject a given level of residual risk.[130]

Vulnerability: The propensity or predisposition to be negatively affected. Vulnerability arises from physical, social, economic, and/or environmental factors and conditions including sensitivity and lack of capacity to adapt.[126]

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Appendix A:

Roles and responsibilities in B.C.'s land use planning system

Federal government

The Canadian Constitution gives provinces authority over land use planning. While the federal government does not control land use planning, they do interact with land use planning through setting housing policy direction, delivering funding programs to support housing initiatives, and setting the National Building Codes, which are minimum requirements that provinces tailor and regulate and local governments implement. The federal government also administers the Disaster Financial Assistance Act Program (DFAA) to provide provinces and territories with financial assistance post-disaster and is working on a national flood mapping and flood insurance program.[62,102]

Provincial government

The provincial government delegates land use planning authority to local governments but retains authority to enact laws and regulations, establish guidelines, require strategic plans and bylaws, and can override anything that is contrary to public interest.[11] The Province also retains distinct levels of oversight where there is provincial interest in land use planning and development. For example, the housing portfolio and development in relation to public highways, riparian areas, agricultural land, water use, and archaeological sites involve a spectrum of regulatory requirements, permitting and approvals, or direct authority that are spread across different ministries (Table A1). Similarly, climate risk roles are integrated across ministries (Table A1).

TABLE A1: ROLES AND RESPONSIBILITIES BY PROVINCIAL MINISTRY

Provincial Ministry	Ministry's role within local government land use system	Integration of climate risk in ministry role
Ministry of Housing and Municipal Affairs	» Oversees provincial housing policy and legislation, sets the legal framework for local governments and guides how municipalities and regional districts plan and regulate land use in B.C. » Developed the Homes for People Plan. » Lead modernization in land use planning, including increasing housing, setting policy direction, and streamlining permitting. » Oversee land use in University Endowment Lands and approve OCPs for Islands Trust. » Provide local government oversight through the Inspector of Municipalities, whose role includes approving regional district's service establishing bylaws, phased development agreements that are more than 10 years, and local government financial-related bylaws.[11]	» Ensure a safe, accessible, energy-efficient, and climate-resilient built environment through building and safety regulation, including integrating extreme heat measures into the B.C. Building Code. » Provide strategic direction for sustainable, resilient community growth. » Support local governments on integrated land use, climate, and economic resiliency to strengthen community capacity.[132] » Support ministries and other partners to work with local governments on initiatives that improve social and economic well-being.

TABLE A1: ROLES AND RESPONSIBILITIES BY PROVINCIAL MINISTRY

Provincial Ministry	Ministry's role within local government land use system	Integration of climate risk in ministry role
Ministry of Transportation and Transit	» Align and integrate transportation with land use for complete, connected communities.[133] » Approval role for zoning, development, subdivisions near "controlled access" highways.[134] » Provincial Approving Officers have an approval role for subdivisions and bare land stratas that are outside of municipal jurisdiction. This includes Regional Districts and Island Trust, if they do not appoint their own approving officer.[13]	» Strategic direction to integrate climate resilience into infrastructure projects, and develop resiliency engineering policy, standards, practices.[133] » Lead ministry for geologic (landslides, avalanche, debris flows) and hydrological (ice jams) hazards that affect provincial highways.[135]
Ministry of Water, Land, and Resource Stewardship	» Not specific to local government land use but has role in advancing provincial land use planning for sustainable natural resource management with First Nations.[136] » Regulation role for the protection of riparian areas during development.[137] » Regulation role for the construction, operation, and management of dikes through oversight and approval by the Inspector of Dikes. » Regulation and coordination role for water including watershed management and licensing.	» Lead ministry for flooding, landslide, dams, dikes, drought, and water scarcity.[135] » Led the B.C. Flood Strategy. » Ministry Service Plan objective (2.4) to advance actions that reduce risk and increase resilience in response to increasing hazards.[136]
Ministry of Agriculture and Food	» Oversight role to inform land use decisions related to agricultural land reserves (ALR). » Responsible for the Agricultural Land Commission, who has a role of collaborating with local governments to ensure land use plans and bylaws align with provincial legislation and approve subdivisions in ALR.[138]	» Ministry Service Plan Goal (2) to support the agriculture and food sector to improve emergency preparedness and adapt to climate.[139]
Ministry of Forests	» Regulation role in protecting and preserving sites with historical, cultural, and/or archaeological value in B.C., in consultation with First Nations, through a provincial permitting process.[140] » Houses the BC Wildfire Service who holds the provincial role for fire use, wildfire prevention, control, and rehabilitation.	» Lead ministry for wildfire and interface hazards.[135] » Ministry Service Plan Goal (3) to improve community resiliency and reduce wildfire risk, including treating the wildland urban interface, and Goal (4) to improve resiliency of B.C. forests to climate.[141]

TABLE A1: ROLES AND RESPONSIBILITIES BY PROVINCIAL MINISTRY

Provincial Ministry	Ministry's role within local government land use system	Integration of climate risk in ministry's role
Ministry of Emergency Management and Climate Readiness	» Does not have a formal role in land use planning but is the lead ministry for coordinating reduction of climate-driven impacts and hazards.	» Ministry Service Plan mandate to lead the Province's strategies and systems to reduce impacts of climate-driven hazards and other disasters (Goal 1), establish Indigenous Peoples as true partners and leaders in emergency and disaster risk management (Goal 2), and modernize and enhance all phases of emergency management (Goal 3).[60] » Lead ministry for atmospheric hazards (other than extreme heat and public health), and earthquake, tsunami, and volcano hazards.[135] » Led the provincial disaster and climate risk and resilience assessment (DCRAA) and manages ClimateReadyBC.
Ministry of Energy and Climate Solutions	» Does not have a formal role in land use planning and climate risk but is the lead ministry for electricity and energy.	» Houses the Climate Action Secretariat, who led the 2022 Climate Preparedness and Adaptation Strategy and collaborated on the provincial DCRRA. » Ministry Service Plan objective around management of risks and consequences associated with a changing climate, in partnership with EMCR.[142]
Ministry of Indigenous Relations and Reconciliation	» Does not have a formal role in local government land use planning but is responsible for advancing equitable social and economic outcomes for Indigenous Peoples and implementing reconciliation and UNDRIP across government.[143]	» Specific actions to collaborate to implement the climate adaptation strategy, support resilient communities, and co-develop policies and initiatives to advance the stewardship of environment, land, and resources.[144]

Local governments

Local governments (both municipalities and regional districts) are delegated authority to govern land use planning through the Local Government Act, Community Charter, and to a lesser extent Land Title Act. A handful of local governments are governed by their own provincial legislation with distinct land use planning responsibilities, for example, Vancouver,[145] Whistler,[146] and Islands Trust.[147]

Both municipalities and regional districts have land use planning and development authority for their jurisdiction through strategic long-range tools, such as official community plans (OCPs) and regulatory tools such as zoning bylaws and development permit areas (DPAs). Regional districts, comprised of municipalities, electoral areas, and sometimes Modern Treaty Nations, operate within a slightly different context. Regional districts provide land use services to electoral areas and municipalities that chose to opt in.

Regional districts have flexibility to adopt OCPs and bylaws in various configurations based on their local jurisdictions. For example, each electoral area in a regional district may have their own OCP, or all electoral areas in a regional district may share one overarching OCP. Regional district boards also have the unique authority to develop and adopt RGSs, which are long-range region-wide planning documents.

The subdivision of land (i.e., changes to parcel lines, lot creation, and consolidation) is a more complex process involving overlapping interests and authority beyond just the local government. Municipalities appoint a municipal approving officer who approve subdivisions within their jurisdiction. Regional districts and Islands Trust can appoint their own approving officer for subdivisions, but if they do not, then a Provincial Approving Officer (Ministry of Transportation and Transit) approves subdivisions. This is currently the case for all regional districts and Islands Trust. Approving Officers are statutory decision makers and ensure subdivision proposals align with both provincial legislation and local bylaws.

Municipal councils and regional district boards, each comprised of elected officials, hold decision-making power for land use planning. For example, they are responsible for adopting official community plans and bylaws, approving development permits, and approving any deviation from a local government bylaw (i.e., development variance, rezoning, OCP amendments, and exemptions) unless development permits and approvals are delegated to staff.

Municipal and regional district staff are responsible for making recommendations to council or boards related to land use and development decisions, executing land use plans, overseeing and supporting development applications, and ensuring compliance with local government bylaws.

Municipalities and regional districts are also responsible for flood management, emergency management, and in most cases, dike operations and maintenance. They are generally expected to identify and consider climate risks across their portfolio.

First Nations and Modern Treaty Nations

For millennia, Indigenous Peoples have planned for the use and care of their territories based on Indigenous laws and customary rights, which varied Nation to Nation[15]. Indigenous Peoples' relationships to their lands are tied to "stories, social and moral codes, cultures, and economies," which shape land uses including trade, transportation, hunting, harvesting, and fishing, and living arrangements.[155 (p 27)]

Through the Indian Act, the federal government dispossessed First Nations from their lands and imposed restrictive governance systems that limited authority over many conditions including land use and housing. While many Nations in B.C. continue to operate under these constraints, they continue to steward their territories, and many undertake land use planning to strengthen self-governance.[15] Some First Nations have entered formal governance arrangements that provide greater authority over land use planning. Modern Treaty Nations, including Nisga'a First Nation, Tsawwassen First Nation, Tla'amin First Nation, and Maa-nulth First Nations hold distinct law-making authority over land use planning and management on each of their treaty settlement lands. Other First Nations in B.C. continue the process of treaty negotiation.[148] As of 2024, First Nations can also register and hold fee simple land in their name.[149]

First Nations governments play a primary role in emergency management from prevention to recovery.[23, 64] First Nations face disproportionate impacts of climate change and hold intergenerational knowledge and wisdom of their lands and waters, based on relationships and reciprocity, to lead and support adaptation.[22, 150]

Qualified professionals

Qualified professionals do not have legislative authority for land use planning. However, there are several pieces of legislation that invoke professional reliance. For example, professional assessments during subdivision approval, development permits, or building permits to determine if land may be used safely. These assessments support local government council and staff, approving officers, and building inspectors on land use and development decisions. Qualified professionals may also be involved in supporting local governments with climate and hazard risk assessments and adaptation or resilience plans.

Insurers

Insurers do not have legislative authority for land use planning but play a key role in protecting properties and valuables from climate risks and covering insurable losses after a disaster.

Insurers create influence over land use planning and risk reduction decisions through the availability of insurance, cost of insurance, and by offering incentives. The rising cost of insured losses from climate hazards, combined with other factors such as high rebuilding costs, labour shortages, and tariffs, are shifting the insurance industry with higher premiums and reduced coverage in high hazard areas.[61]

Lenders

Lenders, including banks, credit unions, and other mortgage and construction financing providers, do not have legislative authority over land use planning but influence development through financing decisions. Lending decisions are informed by property appraisals, regulation (e.g. B.C. Financial Services Authority), insurance availability, and assessments of financial risk. Properties in high-hazard areas may face stricter lending conditions, higher borrowing costs, or reduced access to financing. By determining whether and under what conditions to provide loans, lenders shape which projects proceed and on what terms. As climate-related financial risks and disclosure expectations evolve, lenders are increasingly incorporating physical and transition risks into portfolio management. In doing so, they can indirectly incentivize risk reduction and resilience measures and influence development patterns over time.

Developers

Developers do not have legislative authority but do engage in development as structured and determined by local and provincial governments. They can also apply to change land use plans and bylaws (i.e., rezoning, variance, and OCP amendment) for their own development applications. Developers have a responsibility to abide by all local bylaws related to land use planning and development but are not required to reduce risk unless specific provisions exist. This may include consideration for climate risk and natural hazards via development permit areas, floodplain bylaws, covenants, or other agreements that relieve local governments of financial or legal liability.

Property owners and renters

Property owners have a responsibility to abide by all local bylaws related to land use planning, development, and the B.C. Building Code. Individual land or property owners may have covenants registered against their title and must adhere to all provisions. This may include consideration for climate risk and natural hazards via development permit areas, floodplain bylaws, covenants, or other agreements that relieve local governments of financial or legal liability. Property owners and renters may also engage in property-level risk reduction measures as required or incentivized by local governments or insurance providers.

Appendix B:

Land use policy tools that can integrate climate hazards in B.C.

The following land use and climate policy tools are specifically enabled through legislation in B.C.'s land use planning framework. They do not include voluntary local government plans or programs that may also address climate hazards and land use planning.

Regional growth strategy
Local Government Act, Part 13

Used: Regional districts in collaboration with member municipalities, electoral areas, and First Nations.

Purpose: A RGS is a long-range strategic planning document that guides region-wide growth, change, and development alongside social, economic, and environmental goals.

Climate risk lens: RGS legislation includes language around settlement patterns that avoid sprawl, protect environmentally sensitive areas, and "minimize the risks associated with natural hazards."[11(§428(2)(k))] Some RGSs have included considerations for regionally applicable climate impacts and objectives related to adaptation.[151]

Official community plan
Local Government Act, Part 14, Division 4

Used by: Municipalities (required) and regional districts (voluntary, though most have individual OCPs or one overarching OCP for their electoral areas).

Purpose: An OCP is long-range strategic planning document that sets overarching objectives and policies related to planning and land use. OCPs address other local matters such as social and cultural needs, housing, environmental protections, transportation patterns, agricultural outcomes and more.

Climate risk lens: OCPs should implicitly or explicitly direct growth and development relative to hazardous areas and legislation outlines that OCPs must respect "restrictions on the use of land subject to hazardous conditions or that is environmentally sensitive to developments."[11(§473(1)(d))] To support these objectives, OCPs can include land use designations such as urban containment boundaries or development permit areas (see below). Some OCPs have included considerations for regionally applicable climate impacts and objectives related to adaptation.[151]

Zoning bylaw
Local Government Act, Part 14, Division 5

Used by: Municipalities and regional districts.

Purpose: Zoning bylaws regulate how land, buildings, and structures may be used, as expressed by overarching designations and objectives in OCPs and RGS.

Climate risk lens: Zoning bylaws can implicitly or explicitly direct location, use, density, siting, and size of buildings or structures relative to hazardous areas.

Development permit areas
Local Government Act, Section 488

Used by: Municipalities and regional districts.

Purpose: A development permit is designated in an OCP where broad and/or site-specific provisions are required before development can proceed. If land is designated as a DPA, land must not be subdivided or altered, and buildings must not be constructed or altered until a development permit from the local government has been issued, unless an exemption applies.

Climate risk lens: Legislation outlines all eligible purposes for a development permit area and includes specific DPAs used for "the protection of development from hazardous conditions."[11(§488(b))] DPAs can be specific to hazard type or inclusive of multiple hazards (e.g., coastal, steep and unstable slope, wildfire, and flooding). Specific to wildfire, DPAs can include requirements for the character of development, siting, form, exterior design, finish, and landscaping.[11(§491,152, 2(c))] DPAs can also require a report from a qualified professional to assist the local government in determining if conditions or requirements in the development permit are met. DPAs may also be used to protect the natural environment, promote energy and water conservation, and reduce emissions, which may present co-benefits for addressing climate risk.[151]

Floodplain bylaws
Local Government Act, Section 524

Used by: Municipalities and regional districts.

Purpose: Land designated as a floodplain can specify flood level, setbacks, and other provisions. Local governments may exempt proponents of floodplain bylaw provisions if exemptions are consistent with provincial guidelines or they have received a qualified professional report that states the land may be safely used for the intended purpose.

Climate risk lens: Bylaws must consider provincial Flood Hazard Land Use Management Guidelines.[153] Provincial guidelines state that local governments must consider floodplain mapping (based on a 200-year flood) when making their bylaws. Where floodplain maps do not exist, the provincial guidelines set minimum setbacks and flood construction levels (FCLs) for several types of water bodies and different land uses. There are specific provisions related to climate change and sea level rise (1.0 m by 2100).

Screening and landscaping bylaws
Local Government Act, Section 527

Used by: Municipalities and regional districts.

Purpose: Bylaws can require or set standards for screening or landscaping to prevent hazardous conditions.

Climate risk lens: A bylaw can support risk reduction through landscaping. This is particularly relevant for reducing wildfire risk through FireSmart.

Tree protection bylaws
Community Charter, Section 8

Used by: Municipalities. Regional districts can only regulate and introduce tree cutting permits in areas designated as hazardous (Local Government Act, s. 500)

Purpose: Bylaws can regulate tree management including protection, cutting, removal, and damage of trees..

Climate risk lens: When paired with Urban Forest Strategies and canopy targets, tree bylaws can contribute to mitigating extreme heat, air pollution, and floods.

Subdivision approval
Land Title Act, Section 86

Used by: Municipalities (municipal approving officers), regional districts, and Islands Trust (usually provincial approving officers unless one is appointed)

Purpose: While not a policy or regulation, subdivision approvals (e.g., for changes to parcel lines, lot creation, or consolidation) include specific considerations for climate risk.[154]

Climate risk lens: An approving officer can require a geotechnical assessment that the land can be used safely for the intended purpose. The geotechnical study can be an initial study or a site-specific study with the outcome of the latter being determining if there is a hazard, the extent of the hazard, and building sites free from hazard or where risk is "acceptable." The approving officer can refuse subdivision approval if the land could be expected to flood, erode, land slip, or avalanche. Similar provisions apply for bare land strata approvals.[15]

Subdivision requirements
Local Government Act, Section 506

Used by: Municipalities and regional districts.

Purpose: Bylaws can regulate or require certain provisions, standards, or services with respect to development of land.

Climate risk lens: A bylaw may regulate and require sustainable design features that provide for energy and water conservation, emissions reduction and climate resilience.

Building permits
Community Charter, Section 56

Used by: Municipalities and regional districts (building inspectors).

Purpose: While not a policy or regulation, building permit issuance includes specific considerations for climate risk.

Climate risk lens: If a bylaw regulating building construction is in effect and a building inspector considers that construction is on land subject to hazards, the building inspector may require the property owner to provide a report by a qualified professional that the land will be used safely for the intended purpose. If the report determines the land cannot be used safely, a building permit must not be issued.

Covenants
Land Title Act, Section 219

Used by: Municipalities and regional districts.

Purpose: While not a policy or regulation, a covenant is a legal tool that may be registered against title to the land and is enforceable against the current and future property owners. Covenants may be negative or positive and can include provisions related to the use of land, building, subdividing or not, as well as it providing a specific amenity.

Climate risk lens: Covenants may be used in combination with DPAs, floodplain bylaws, subdivision approval, building permits or other regulations to preserve specific hazard-related provisions on the land title and/or remove local government liability if a hazard event occurs.

Remedial action
Community Charter, Division 12

Used by: Municipalities and regional districts (specific authority for regional districts is outlined in Local Government Act s. 305 and 309)

Purpose: Ability to impose remedial action orders for matters related hazardous conditions, declared nuisances, and harm to drainage or dike infrastructure. The order can be imposed on buildings, trees, structures, openings in the ground, etc., that are creating unsafe conditions.

Climate risk lens: May be used to direct property owners to reduce hazardous conditions on their properties or when it poses risk to other properties.

Riparian area regulation assessments
Riparian Areas Protection Regulation

Used by: Municipalities and regional districts within specific boundaries outlined in Section 2 of the regulation.

Purpose: For any development in a location where the riparian areas protection regulation applies, a qualified professional assessment is required.

Climate risk lens: While not specific to climate risk, the assessment considers active floodplain (one in five-year flood) and the qualified professional should identify other issues related to floodplain and alluvial fans.

Pacific Institute for Climate Solutions

PO Box 1700 STN CSC
Victoria, BC V8W 2Y2 Canada

pics@uvic.ca
climatesolutions.ca

We acknowledge and respect the lək̓ʷəŋən Peoples on whose traditional territory the University of Victoria stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.