



Land use planning in a changing climate: Policy opportunities

Prepared by Dr. Andr anne Doyon*, Mieke Boeker, Piper French, & Simonne Mikolay

*Associate Professor, School of Resource and Environmental Management

Associate Dean Undergraduate, Faculty of Environment

Simon Fraser University (SFU)

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1. Introduction

Land use planning is a priority area for the Provincial government of British Columbia (BC). Land use planning – where and how communities develop, and ecosystems are cared for – plays a pivotal role in both exacerbating and responding to climate risk. Land use planning is complex and must consider how to align the diverse priorities of decision makers and land users, which meets the needs of current and future generations of humans and natural ecosystems. This is further complicated by the short- and long-term impacts of climate change. This can lead to competing priorities, timelines, and incentives, especially when costs of (in)action transcend political jurisdictions, or when regulatory frameworks are misaligned at various orders of government.

This report presents three categories of land use planning policies that are used by other jurisdictions, which are feasible under current regulatory regimes in BC to reduce climate risks. The three policy categories are: 1) Impact Assessments, 2) Urban Growth Boundaries, and 3) Housing Designs. Each policy is introduced with consideration of the current context in BC. Case studies are provided from outside jurisdictions for each policy. Finally, recommendations are provided for how the policies could be applied in the BC context, including potential benefits and challenges. Where relevant implications for the BC [Declaration on the Rights of Indigenous Peoples Act](#) (DRIPA), reconciliation with Indigenous peoples, and historically marginalized communities are considered.

2. Assessments to inform land use planning

Proposed developments of a certain type, size, or location can trigger the need for additional assessment. Tools that can trigger further assessment include Environmental Impact Assessments (EIAs), climate risk assessments, and Development Permit Areas (DPAs). The scale and scope of a project will often determine what assessment is triggered. These tools can be used to ensure that development supports climate change adaptation and mitigation goals, protects lives, and builds more resilient communities.

2.1. Environmental Impact Assessment

Environmental Impact Assessment (EIA), also referred to as Environmental Assessment or Impact Assessment, is a tool that assesses the effects of a proposed project before approval. As a key decision-making tool, EIAs are intended to prevent significant adverse effects of proposed projects while maximizing benefits. While there is variety in the ways

that countries implement EIAs, in BC “the [environmental assessment process](#) ensures that any potential environmental, economic, social, cultural and health effects that may occur during the lifetime of a major project are thoroughly assessed.” EIAs will generally outline potential environmental, social, and economic effects of a project and propose measures to mitigate those impacts. However, not every proposed project is subject to an EIA.

In Canada, EIAs are conducted for major projects that have the potential to cause significant adverse effects in areas of federal jurisdiction, as described in Canada’s [Impact Assessment Act](#). Types of projects that usually meet this criterion, and are therefore subject to an impact assessment, are listed in the [Physical Activities Regulations](#).

A similar process exists in BC, outlined in the [Environmental Assessment Act \(EAA\)](#), with reviewable projects listed in the [Reviewable Projects Regulation](#). However, the appropriate Minister can also designate a project as reviewable, or the public can request that the Minister designates a project as such. Other types of assessments outlined in the EAA that the BC government can use during the impact assessment process include:

- Strategic assessments: evaluates a specific policy or plan from the government (section 72).
- Regional assessments: consider the environmental, economic, social, cultural, and health effects of projects in a region (section 35).
- Class assessments: assessments of a specific category of reviewable projects (section 34).
- Indigenous-led assessments: assessments can be conducted through agreements with one or more Indigenous nations (section 41), which can allow Indigenous governing bodies to determine how impacts are assessed.

BC is not required to incorporate these other types of assessment into their EIA process. Although, other countries have demonstrated the benefits of utilizing other types of assessment to ensure all potential effects are considered.

2.1.1. Case study: New Zealand's Cultural Impact Assessment

Cultural Impact Assessments (CIAs), one of the impact assessment tools utilized in New Zealand, supports meaningful Māori participation and collaboration on proposed

projects and plans with local governments, EIA, and land-use planning¹. CIAs are usually completed as a complement to EIAs with the intention to understand the diverse perspectives of Indigenous communities and apply their views in development planning. They also support the [United Nations Declaration on the Rights of Indigenous Peoples](#) (UNDRIP) by upholding Indigenous Peoples' rights to determine how their lands should be developed. These assessments range from being informational about Indigenous heritage to being full Indigenous-led assessments, usually conducted by Māori researchers². Because CIAs are Indigenous led, they avoid potential cultural damage from proposed development, integrate a mix of different knowledge, and evaluate the consequences of development on future generations³. While CIAs can be like Indigenous-led assessments in BC, New Zealand provides more guidance for conducting these assessments.

The [Cultural Impact Assessment Toolkit](#) describes the five key components of a CIA, which are:

- Communicate: provide information to promote understanding, mutual learning and planning.
- Identify: map existing state, the cultural life, institutions and resources of populations and communities.
- Predict: consequences of action, future state of cultural life and resources with and without change.
- Evaluate: analysis of cumulative effects of development, future change, impacts on people and communities.
- Integrate: findings communicated into cultural values-based planning and design, impact assessment. and decision-making processes, ongoing relationships, and effects monitoring.

CIAs are also a way of upholding Indigenous rights as outlined in UNDRIP. While CIA work continues to evolve in New Zealand, it presents an example and opportunity of what types of impact assessments can better support a resilient, sustainable future.

¹ Ministry of Business, Innovation & Industry, New Zealand (2024.) To Kete Tātari Kawekawe Tikanga: Cultural Impact Assessment Toolkit, *Building Better Homes, Towns and Cities*. <https://www.buildingbetter.nz/wp-content/uploads/2024/08/BBHTC-Cultural-Impact-Assessment-Toolkit-publication-WEB.pdf>

² Ibid.

³ Ibid.

2.2. Climate Risk Assessment

Climate risk assessments identify potential future effects of climate hazards, such as floods, wildfires, and extreme heat, on communities, regions, or broader areas. Understanding what hazards communities are vulnerable to will help guide future land use decision-making. BC has begun the process of assessing the province's climate risks with the [Preliminary Strategic Climate Risk Assessment for British Columbia](#) report, which examined 15 potential climate hazards. Building on this report, BC has released the [British Columbia Disaster and Climate Risk and Resilience Assessment](#) (DCRRA) for key hazards like coastal and riverine flooding and wildfires. The DCRRA introduces a structured approach to assessing risk and resilience across interconnected systems in BC, providing a foundation for planning and action to guide and build a safer, more resilient future for all. DCRRA is intended for First Nations, local authorities, public sector agencies such as ministries and health authorities and others to support understanding and management of disaster and climate risks in British Columbia.

Local governments in BC are responsible for understanding and responding to the risks posed to their communities, as outlined in the [Emergency and Disaster Management Act](#). For example, they may adopt bylaws to designate floodplains and specify flood construction levels and setbacks to regulate development in flood prone areas. The Province provides guidance for local governments, such as the 2012 report [Preparing for Climate Change: An Implementation Guide for Local Governments in British Columbia](#), and through the [ClimateReadyBC](#) website, however local governments are ultimately responsible for making land use decisions that address climate risk.

2.2.1. Case study: UK's Flood Risk Assessment in flood zones

The UK has flood risk assessment policies that regulate development in flood hazard areas. All local planning authorities in the UK must create a level 1 Strategic Flood Risk Assessment (SFRA)⁴. A level 2 SFRA may also need to be conducted if not all development can be done outside of flood risk areas, or the local planning authority anticipates a high number of development applications in high flood risk areas⁵. These SFRAs analyze the risks posed by flooding, the effect of climate change on flood risk, and the cumulative impact of development or land use change on risk of flooding in the local planning area. SFRAs support the local planning authority with several decisions, including decisions on individual planning applications, infrastructure planning, climate change adaptation, and

⁴ Environment Agency. (2013). How to prepare a strategic flood risk assessment. Government of UK. <https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment>

⁵ Ibid.

they help with carrying out the ‘Sequential Test’ for local plans and development. The Sequential Test ensures that the lowest flood risk areas are developed in preference to higher risk areas, providing an effective way to reduce flood risk by not relying on flood defenses, warnings, and property-level resilience features⁶.

Planning applicants may need to carry out a flood risk assessment (FRA) for their proposed development site⁷. FRAs should be completed for all development proposed in certain areas, such as a Flood Zone 2 or 3, a Flood Zone 1 with a site area of 1 hectare or greater, in flood zones areas at increased risk from climate change, or in areas where the local planning authority’s SFRA has determined that the site will be at an increased risk of flooding⁸. The UK Government provides a [flood mapping service](#) that can show developers if their proposed development is in Flood Zone 2 or 3, which indicates a higher probability of annual flooding. Development proposals may be rejected by the local planning authority if they do not include flood risk assessments⁹.

Local planning authorities are encouraged to keep an updated register of available development sites, ranked by flood risk preference, to support developers with choosing safer development sites. Once a development site has been selected, flood risk is further reduced by following the principles of control, mitigation, and managing residual risk¹⁰. The UK’s flood risk assessment is an excellent example of how government can adopt policies and provide a methodology to create resilient communities.

2.3. Development Permit Areas

Development Permit Areas are locations identified by local governments that have additional development regulations. DPAs can be used for several purposes, including: to protect development from hazards, to protect the environment, and to regulate the built form and character of buildings. In BC, DPAs are designated in a local government’s Official Community Plan (OCP), with guidelines for DPA development addressed in the OCP or a zoning bylaw. Property owners within a DPA must get a permit before constructing, altering a building, or altering the land. When planning for climate change, DPAs can be utilized to protect development from hazards, such as wildfire and floods,

⁶ Ministry of Housing, Communities and Local Government, Flood risk and coastal change, Government of UK. (2014). <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

⁷ Environment Agency, Flood risk assessments: applying for planning permission, Government of UK. (2014). <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

⁸ Ibid.

⁹ Ministry of Housing, Communities and Local Government, Flood risk and coastal change, Government of UK. (2014). <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

¹⁰ Ibid.

by mitigating risks and encouraging safe development.

Through the 2011 report, *Development Permit Areas for Climate Action: A Guide for Energy Conservation, Water Conservation and GHG Emissions Reduction*, BC has provided information for local governments with respect to DPAs' potential for climate action. BC's report also suggests that local governments should consider climate change adaptation when creating DPAs. Many local governments in BC utilize DPAs to protect against flooding and wildfire, including the District of North Vancouver and City of Surrey, who have maps indicating wildfire and flood hazard DPA boundaries, respectively. However, not all local governments in BC have climate hazard-specific DPAs. Lessons can be learned from other places where DPAs have been utilized for climate risk reduction.

2.3.1. Case study: Australia's designated bushfire prone areas

Australia's development permit areas for wildfire represent a coordinated approach between state and local-level governments. Each state in Australia has land use policies to regulate development in wildfire prone areas, the most common being the designated bushfire prone area (BPA). A BPA is an area where bushfires occur or there is a risk of bushfires¹¹. New buildings in BPAs must be built to a national bushfire construction standard.

States in Australia, such as the Victoria State Government, provide a [mapping tool](#) where property owners and local governments can determine what properties overlap with a BPA. In Victoria, if new buildings are proposed in a BPA, then a bushfire attack level (BAL) assessment is conducted to determine the severity of a building's exposure to ember attack, radiant heat and direct flame contact¹² (see Figure 1). Buildings must be constructed to align with the Australian Standard 3959:2018 construction requirements of buildings in BPAs. At minimum, buildings must meet the standard for BAL 12.5¹³. This case study emphasizes how state (provincial-equivalent) guidelines and mapping tools can support local governments with climate risk reduction.

¹¹ Victoria State Government (n.d.). Building in designated bushfire prone areas. <https://www.planning.vic.gov.au/guides-and-resources/guides/all-guides/building-in-bushfire-prone-areas>

¹² Ibid.

¹³ Department of Environment, Land, Water and Planning, State of Victoria. (2019). Bushfire Mapping Methodology and Criteria. https://www.planning.vic.gov.au/_data/assets/pdf_file/0030/639507/Fact-sheet-Bushfire-mapping-methodology-and-criteria.pdf

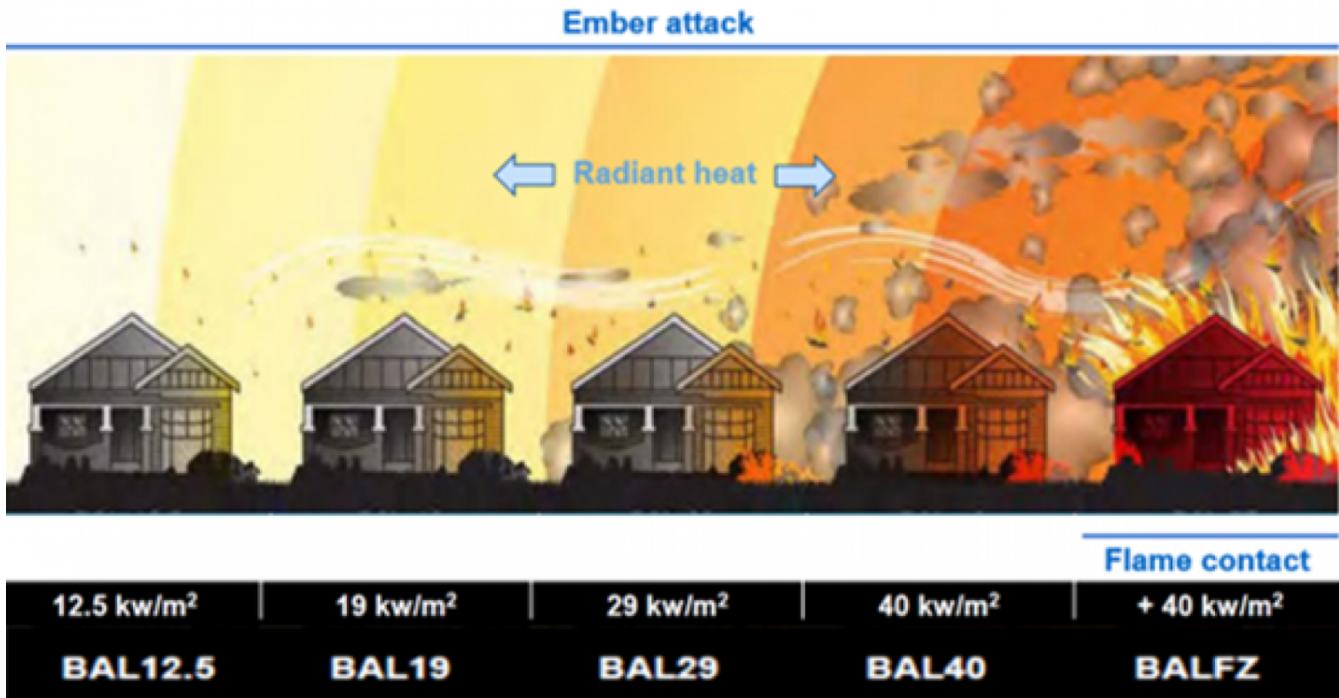


Figure 1. The Victoria State Government’s five bushfire attack levels and the corresponding exposure to ember attack, radiant heat, and flame contact¹⁴.

2.4. Recommendations

Ensuring that development projects support climate adaptation goals require local and provincial government collaboration. EIAs and DPAs have been utilized by the Province and local governments respectively in BC. See Table 1. For key comparison points between DPAs and EIAs. EIAs can be more expensive and/or time-consuming when they are collaborative or require additional assessments but ensuring that proposed projects maximize cultural, environmental, and social benefits will support communities longer-term. DPAs can also take time to establish but can be an effective way to ensure development is safe from hazards. Climate risk assessments remain underexplored in BC policies. However, progress is being made with the update to the Emergency and Disaster Management Act (EDMA) and the introduction of the BC Disaster and Climate Risk and Resilience Assessment (DCRRA). Ensuring that development avoids the highest-risk areas and is protected from hazards will reduce long-term costs and support resilient communities.

¹⁴ Victoria State Government, Building in designated bushfire prone areas. (2024). <https://www.planning.vic.gov.au/guides-and-resources/guides/all-guides/building-in-bushfire-prone-areas>

Table 1. Key Comparison Points between DPAs and EIAs

Feature	Development Permit Area (DPA)	Environmental Impact Assessment (EIA)
Authority	Local Government (City/District)	Provincial or Federal Agency
Regulatory Tool	Official Community Plan (OCP) or Zoning Bylaw	Environmental Assessment Act or Impact Assessment Act
Scope	Small-scale: Local parcels, specific habitats, hazards	Large-scale: Mines, dams, pipelines, major roads
Output	A development permit (legal document on title)	An EA Certificate or Decision Statement
Focus	Site design, buffers, building character	Cumulative, long-term environmental/social effects
Trigger	Development within a mapped DPA zone	Project exceeds size/impact thresholds in regulations

Provincial:

- Improve on environmental assessment practices by supporting Indigenous-led or collaborative environmental assessments for major projects.
- Create climate risk assessment policies that requires local governments to address climate hazards in land use decision making and encourage development in the lowest risk areas, following the UK’s practice of using the ‘Sequential Test’.
- Require local governments to conduct strategic climate risk assessments, for example, by following the UK’s approach for requiring local planning authorities to conduct Strategic Flood Risk Assessments.
- Map areas of high climate hazard risk across the province and support local governments with identifying what areas should require a development permit based on hazard threat severity.
- Include potential changes to hazard areas based on projections of future climate scenarios.
- Encourage broader use of DPAs for natural hazards.

Local:

- Provide information and resources, such as hazard mapping (see Case Study 2.3.1.), to property owners in flood, fire, or other hazard risk areas so property owners are aware of development risks and required permits.

- Create strategic risk assessments for certain hazards specific to the municipality (floods, wildfires, etc.).
- Encourage development in lowest risk areas to climate-related hazards by creating a register of available development sites with hazard risk preference, based on a sequential test (see Case study 2.2.1.).

3. Urban Growth Boundaries

“Climate hazards don’t stop at municipal boundaries and our adaptation strategies cannot either”¹⁵

An urban growth boundary (UGB), also known as an urban containment boundary (UCB) or growth containment boundary (GCB), is a land use planning tool that is primarily implemented to restrict urban sprawl into agricultural and environmentally sensitive areas and to encourage compact and complete communities. The effectiveness of UGBs as a climate adaptation approach may be enhanced through additional land conservation, such as greenbelt policies. Currently, UGB implementation is voluntary in BC. [Part 13 of the Local Government Act](#) (LGA) permits regional districts to establish Regional Growth Strategies (RGSs) that can mandate member municipalities to develop a UGB policy in their OCPs. Within two years of a RGS being adopted, municipalities must include a [regional context statement](#) in their OCPs that outlines how local goals will complement the district’s goals.

Several regional districts in BC’s high-growth areas have mandated UGBs for their member municipalities through an RGS, such as the [Regional District of Nanaimo](#). Municipalities can establish their own UGB policy in their OCP even if their regional district hasn’t initiated a regional UGB policy yet, as the [Municipality of North Cowichan](#) has done. Importantly, UGBs can also serve to protect areas of importance to First Nations, as highlighted in the Municipality of North Cowichan’s [OCP](#), thereby supporting BC’s [commitment to modernize land use planning](#) in partnership with First Nations. Successfully mobilizing UGB policy for climate adaptation requires data availability and processing capacity, as well as supporting legislation.

3.1. Data-driven urban growth boundary delineation

BC is no stranger to data-based land use delineation. For example, Agricultural Land Reserve (ALR) boundaries were established in the 1970s based on province-wide

¹⁵ Greenbelt Alliance. (n.d.). Governing Nature-Based Resilience. <https://www.greenbelt.org/governing-resilience/>

Some common challenges that are associated with any risk buffer project are acquisition of high-risk land to adjust the urban growth boundary and ongoing landscape maintenance. While it is within their jurisdiction to do so, the PRPD does not plan to exercise expropriation to obtain the private property that falls within the WRRB. Instead, the PRPD is currently gauging landowners' interest in acquisition, donation, or easement of their property to the WRRB, using a non-binding [form](#). With regard to land acquisition, the Province of BC is currently reviewing its role in the context of disaster recovery and prevention based on new provisions stemming from the federal Disaster Financial Assistance Arrangements (DFAA) guidelines that were passed on April 1, 2025, as communicated in a [letter](#) to the Union of BC Municipalities in August, 2025. New South Wales' [Resilient Homes Program](#) buyback process could be a model for a formalized provincial land acquisition approach based on climate hazard data.

To support ongoing maintenance of the buffer, the PRPD is looking into establishing a funding approach that mirrors the [special levee protection districts](#) approach that is provided to nature-based flooding projects throughout California. The [Bow Valley Community Fireguard](#) is an example of a more extensive wildfire buffer and one that already has set funding allocated to it, by the Forest Improvement Association of Alberta (FRIAA). In addition, Alberta Parks' fuel reduction work, through the removal of trees and vegetation in specific patches of land, will complement the efficacy of the fireguard. It should be noted that wildland buffer or firebreak creation also establishes opportunities for ecosystem-based co-management with First Nations as their Indigenous Knowledge can inform ecologically sound harvesting and thinning operations. For example, the [Okanagan Nation Alliance](#) has been reintroducing prescribed fire on the Okanagan landscape, the formal planning of which began in 2016.

In a similar vein of hazard buffering, the County of Maui has established a countywide Erosion Hazard Line (EHL) in a 2025 [Shoreline Rule Update](#) through sea level rise modelling and local knowledge ground-truthing. The [Shoreline Setback Viewer](#) allows residents to see how their property is impacted and which development standards they will need to abide by. While this approach does not constitute a UGB policy in and of itself, it still places limitations on municipal development based on climate hazard projections, thereby contributing to proactive climate adaptation.

3.2. Land protection beyond the urban growth boundary

Preventing or limiting development on high-risk land within a growth boundary is one part of the solution but having a risk-informed plan of where then to direct this

development is the other. Of BC's six regional districts¹⁶ that have an RGS with UGB policies, only the Regional District of North Okanagan has a Future Growth Area (FGA) land use designation, found in [Schedule F of the RGS](#). The FGA exists within the UGB. The other regional districts have some combination of agricultural, employment, residential, and protected lands designations. While agricultural and protected lands provide protection, they do not necessarily guide the placement of development. For example, the Capital Regional District's [RGS](#) states that new development in its Rural/Rural Residential land use designation should not exceed 5 per cent of the region's overall housing growth. While this may provide guidance on proportionate housing distribution across land uses, it does not provide guidance on where specifically - within a given land use - this development should occur to avoid climate hazards. Conducting climate risk assessments, ideally of overlapping hazards where this is necessary, of developable lands within a UGB would provide valuable context for future growth decision-making.

With future development inevitably taking place outside of currently delineated UGBs, eventually, having awareness of the risk level of lands outside of the UGB can increase the efficiency and soundness of decision-making when the time comes. Greenbelt policy can make land "off limits" thereby safeguarding the high-risk land from development. In BC, the ALR could serve as a legislative model for largescale land preservation that is based on the mapping of geographic and climatic characteristics – introducing combined climate risk mapping would provide greater understanding of where risks are located on undeveloped lands outside of a given UGB. Additional legislation that could support setting aside land includes: the [Greenbelt Act](#) which allows the BC government Cabinet to create Greenbelt Land, through purchase or other acquisition; the [Park Act](#) which allows for the designation of provincial parks, conservancies, and recreation areas; the [Ecological Reserve Act](#) allows for the designation of ecological reserves. Additionally, as pointed out by organization [IPCA Knowledge Basket](#), the [Environment and Land Use Act](#) allows for temporary and flexible protective measures that could be support co-management projects with First Nations.

3.2.1. Case study: Urban and rural reserves - Portland metropolitan area, Oregon

The State of Oregon is known for progressive land use planning practice, being the first state to implement a statewide law in 1973 requiring UGBs for all incorporated municipalities¹⁷. The exception to the rule is the Portland Metropolitan area, which has a

¹⁶ Capital Regional District, Fraser Valley Regional District, Metro Vancouver, Regional District of Nanaimo, Regional District of North Okanagan, Regional District of Okanagan-Similkameen.

¹⁷ State of Oregon. (n.d.). History of Land Use Planning. <https://www.oregon.gov/lcd/op/pages/history.aspx>

regional UGB. In 2006, borne out of frustration with the regional growth management approach at the time, which involved piecemeal UGB expansions based on population and employment projections, a land reserve approach was put into motion¹⁸. A regional land study was carried out to identify ideal future development locations rather than just identifying areas not suited for development – which had previously mainly been determined based on soil quality mapping as agricultural land preservation had been a priority.

In 2007, Senate Bill 1011, built on the study findings, was enacted by the Oregon Legislature, thereby creating a legal mechanism for the Portland Metropolitan region to protect rural land and natural features from urbanization and streamline decision-making around UGB expansion¹⁹. The two main categories of land reserves are:

- **Urban reserves:** first priority land for urbanization over the next 50 years.
- **Rural reserves:** not prioritized for urbanization over the next 50 years. These lands contain high-value working farms, forests, and important natural features (such as rivers, wetlands, and floodplains).

Population and employment needs are still reviewed every six years to make sure that there is a 20-year supply of developable land within the UGB. In the event that a UGB needs to be expanded, only the “pre-screened” urban reserve lands, which currently exist outside of the UGB, will be considered for that expansion. This system creates more predictability in regional growth management investment. In the context of climate change adaptation in BC, if province-wide climate risk projections were to inform the delineation of the reserve land, community safety could also be improved in the long run. As an example, the Netherlands’ National Adaptation Plan (2023) programme modelled several national climate scenarios to enable regional and local governments to map out a suite of climate hazards (sea level rise, heat, drought, and extreme precipitation) to make informed decisions about new development. The interactive maps are publicly accessible through the [Climate Impact Atlas](#), and municipal- and neighbourhood-level assessments can be accessed via the [Neighbourhood Dashboard](#).

¹⁸ Portland Metropolitan Area. (2025). Urban and rural reserves. <https://www.oregonmetro.gov/urban-and-rural-reserves>

¹⁹Portland Metropolitan Area. (2025). Guidelines for bringing land into the urban growth boundary. <https://www.oregonmetro.gov/urban-growth-boundary>

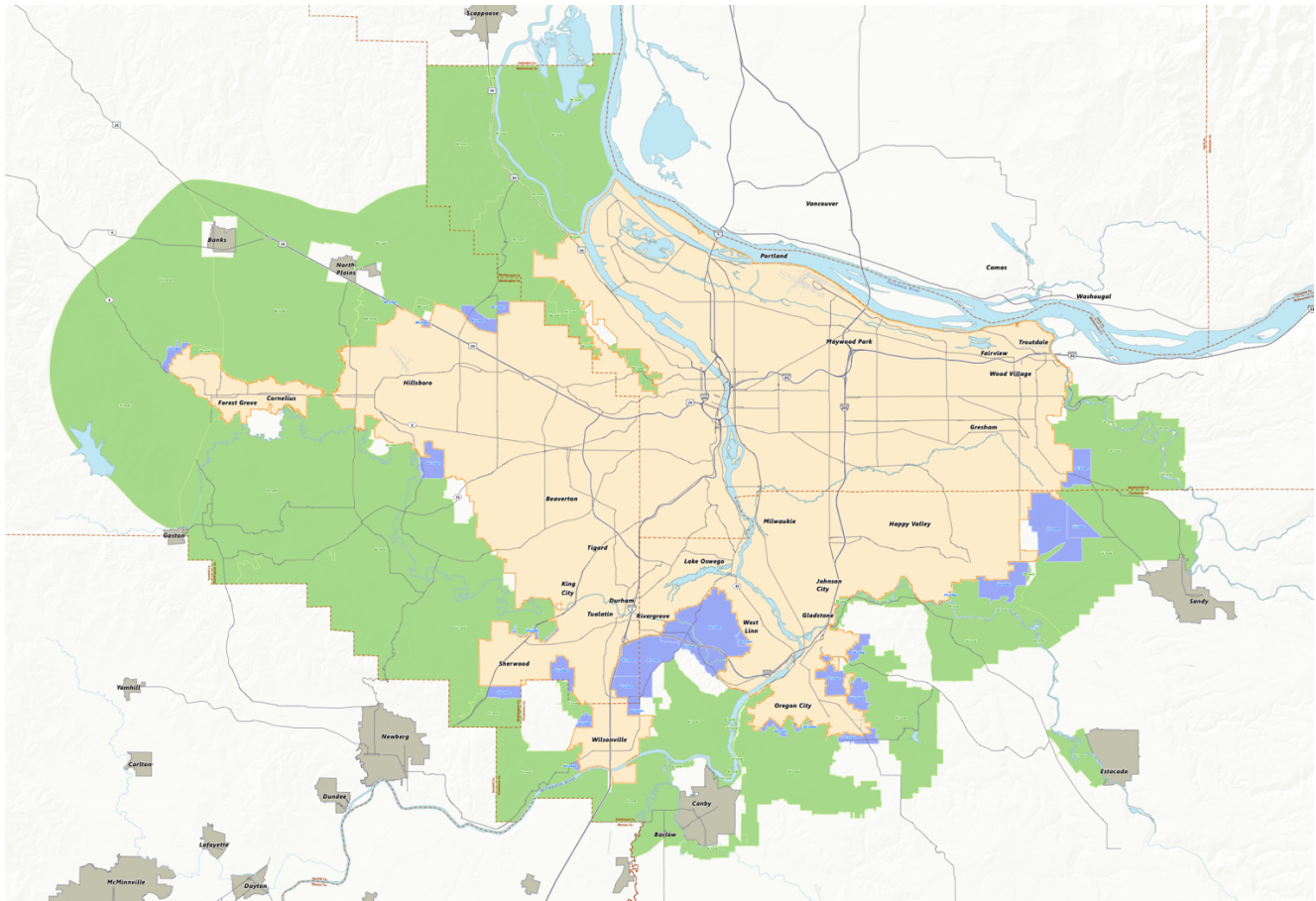


Figure 3. Map depicting the distribution of urban (purple) and rural (green) reserves and existing development (yellow) in the Greater Portland region²⁰.

3.3. Recommendations

Why should we be thinking about UGBs in BC? BC had four of the five fastest growing large urban centres in Canada between 2016 and 2021²¹: Chilliwack, Nanaimo, Kelowna, and Kamloops. All four are in regions that are at risk of flooding (coastal and/or riverine), fire, or both - among other climate hazards such as extreme heat and drought. Climate-informed UGB policy has the capacity to prevent development occurring in areas with the greatest exposure to climate hazards. Additional preservation of lands outside of a UGB strengthens the effectiveness of UGBs to prevent urban expansion into least-suited areas over time.

²⁰ Portland Metropolitan Area. (2025). Urban and rural reserves. <https://www.oregonmetro.gov/urban-and-rural-reserves>

²¹ Statistics Canada. (2022). British Columbia home to four of the five fastest-growing large urban centres from 2016 to 2021. <https://www150.statcan.gc.ca/n1/daily-quotidien/220209/mc-a002-eng.htm>

Provincial:

- Mandate UGB policy provincially. Currently, only 10 of BC's 27 regional districts have RGSs and only 6 of these include UGB policies. While local governments can establish UGB policy at their discretion, being required to do so by the Province could fast-track efforts to curb growth into potentially high-risk areas.
- Require climate adaptation objectives to be outlined in an RGS, as current RGS requirements only include climate mitigation objective.
- Provide more funding for the study and implementation of nature-based risk reduction approaches, such as wildland or riparian buffers.
- Continue to improve data collection and increase accessibility through interactive maps, such as those that may result from the DCRRA, that allow local, regional, and First Nations government staff to overlay various hazard maps to identify high-risk areas in which future development should be inhibited. The current map system for [WUI risk classification](#) and the [Flood Study Explorer](#) uses linked PDFs, which presents navigation challenges.
- Define UGB policy in provincial planning legislation and on the Province's website for ease of reference, as this is currently not the case.

Regional:

- Establish a RGS in which member municipalities are called on to establish UGB policy that factors in climate hazard risk assessments.
- Collaborate with member municipalities to establish a long-term, climate risk-informed urban and rural reserve system to keep development out of identified hazard areas, which could be supported through regional context statements.

Local:

- Consider establishing a local UGB if it has not been mandated by the regional district.
- Prior to UGB implementation, planning tools such as [Development Permit Areas](#) or [covenants](#) can be leveraged to prevent or restrict development in hazardous areas.
- Continue to encourage and guide infill development in identified areas of acceptable risk to compensate for development restrictions hazardous areas. This

could involve offering expedited permitting processes, tax exemptions, density bonusing, pre-approved design plans or design guidelines²².

4. Housing designs

Housing is essential to people’s health, success, and well-being. It is also one of the sectors that is most affected by climate disasters. Both the location and type of housing is essential to deliver climate resilient and good quality housing. There are several mandatory and voluntary policy tools that help shape what housing is built in BC. The most prominent regulatory mechanisms are the provincial and federal building code, and local government bylaws, which are not discussed here. Voluntary policy tools exist across jurisdictions and can include best practice guidelines, pre-approved construction materials, and standards. Below, two voluntary policy tools - pre-approved building plans and design guidelines – are discussed, which provide interesting avenues for integrating adaptation to climate risks into the housing sector.

4.1. Pre-approved residential design plans

Pre-approved residential design plans are building plans available to the public that have already undergone local government approval. These are different than standardized housing designs, such as *BC’s Standardized Housing Design Catalogue*, in that these plans have already undergone local government approval to conform to the local government’s bylaws. These plans conform to all relevant provincial and local policies within the approving local government’s jurisdiction and may either be provided freely to the public or available through purchase. Further than this, pre-approved design plans exceed the requirements of existing provincial-level regulatory mechanisms to promote location-specific resilience to climate risks, this is in addition to meeting the regulatory requirements for structural building elements. Pre-approved residential design plans streamline the building process by:

- providing an opportunity to reduce the time and costs associated with the hiring a qualified designer, to develop custom plans;
- expediting the time allotted to the local government review process; and
- expanding the number of buildings that align with the goals of the reviewing body.

²² C40 Knowledge Hub. (2023). *How to drive urban infill development in your city*. https://www.c40knowledgehub.org/s/article/How-to-drive-urban-infill-development-in-your-city?language=en_US

The primary use for pre-approved residential design plans has been to expedite the development approvals process which can deliver more homes faster. For example, the City of Mississauga, Ontario, implemented pre-approved garden suite plans in 2024 to provide residents with pre-approved models for detached additional residential units. Standardized residential design plans have been used to quickly increase residential density for a long time, and in several BC communities (e.g. the [City of Kelowna's infill housing designs](#)), but this is not mainstreamed across the province.

Pre-approved residential design plans offer local governments the opportunity to address both housing supply and climate adaptation. The pre-approval process allows local governments to tailor building plans and construction materials for their local climate risks. Pre-approved building plans only address new construction and creating them would involve high upfront time and cost for the local government. Similarly, there is a potential challenge associated with the market demand for custom homes. As such, this would not suit every homeowner or local government throughout BC. However, for local governments that expect significant new housing developments in areas that are vulnerable to climate risks, pre-approved residential design plans could equate to overall saving for the local government and the public during the design and permitting phases.

The development of pre-approved design plans is best suited to the local government level, including both municipalities and regional governments, as their jurisdiction most closely aligns with the distribution of climate risks. Similarly, local government development bylaws are highly variable and as such it is this level of government that could oversee the approval process. One possible avenue is for regional governments to develop a number of standardized design plans, and then for the municipalities to adapt these plans to their specific bylaws. Other possible avenues include local governments using freely available standardized housing plans, such as from [BC's Standardized Housing Design Catalogue](#), and adapting them to suit their context, including any relevant climate risks or development bylaws, and pre-approving these adapted plans. Both approaches could be beneficial to both large and small municipalities as it would reduce the overall cost associated with acquiring the building plans.

In the existing examples, local governments have opted to develop the design plans through a design competition as it is an avenue to provide a number of custom plans at the same time and helps provide home builders with multiple options. But it is not necessary to pursue the pre-approved building plans through a design competition. In fact, this option may impose increased costs on the local government to run the competition as well as the builder during the construction phase. However, even if the

building plan is developed through a design competition that requires the building plans to be purchased from the designer directly, there is less costs for the customer to purchase an already developed design plan than a new one, as well as embedded climate resilience.

4.1.1 Case study: FORTIS house, Australia

The [FORTIS house](#) in New South Wales, Australia provides an example of a pre-approved residential design plan that offers adaptation features to multiple hazards. This project was championed by the Resilience Building Council (RBC) of Australia, who collaborated with NRMA Insurance for funding, the Bushfire Building Council of Australia (BBCA), and expert architects, scientists, and engineers for technical input, Shoalhaven City Council for input on municipal bylaws, and Shoalhaven community members to guide the design.

This project was prompted by the 2019/20 bushfire and subsequent flooding in the region which encouraged the community to build back better. To do this, the RBC hosted a series of workshops with Shoalhaven community members which allowed them to provide feedback that guided the design. This feedback was brought to a team of experts to create the final FORTIS house.

The FORTIS house is intentionally designed for adaptation to multiple hazards that are present in the region, with a focus on bushfire and cyclones. Further than just acknowledging adaptation, the design also included mitigation principles by prioritizing energy efficiency and recyclable materials. The project provides three different options for the public: building plans, prefabricated homes, and guidebooks on FORTIS design principles. Further, FORTIS provides four different layout options which allows the home to be tailored to homeowner's preferences while maintaining the adaptation principles. Floorplans and guidebooks are available to the public at no cost.



Figure 4. FORTIS Yerriyong house²³.

Other Examples

The [District of Squamish](#) hosted a design competition for flood-resilient multi-unit housing, which was supported through an external grant. Final building plans are posted on the District’s website and can be purchased directly from the architect. This also occurred in [Oklahoma City](#), who initiated a design competition for permit-ready resilient home building plans. However, it was halted due to loss of federal funding.

4.2. Design guidelines

Design guidelines are an existing and voluntary policy tool used to communicate design goals and preferences. These guidelines exceed regulatory standards to improve the construction and design of a building and ensure that it better suits the local context. Guidelines use a combination of text and visuals to describe preferred designs. Rather than dictating a specific means of constructing a building, guidelines outline the overall goal, granting developers flexibility on how it is achieved. This communication of a local government’s preferences improves the building process by:

- streamlining the review process to clearly show how developments meet above-regulatory expectations of the local government; and
- ensuring that developments align with the local government’s goals and context.

Design guidelines have primarily been used by local governments to communicate their goals for functionality and aesthetics, ensuring that new developments are well suited to the local context. For example, the [City of New Westminster](#) design guidelines for multi-unit residential buildings outline their vision of a well-connected and active neighbourhood. This design guideline includes goals such as increasing the city’s tree canopy and maximizing ventilation through the building. While these goals indirectly

²³ Resilient Building Council. (2022). FORTIS Technical Handbook. Page 41.

influence climate adaptation, for example, to extreme heat, they do not directly engage with it.

Design guidelines could be expanded to address preferred practices for climate adaptation. Local governments are accustomed to managing competing interests for new developments through design guidelines. Tailoring existing design guidelines to address relevant climate risks provides an opportunity to seamlessly integrate climate adaptation into existing tools that both local governments and developers understand. Design guidelines have a few limitations, namely they can slow down the development process as they require more time during the design and permitting review phase, and they are often used as a voluntary policy tool, which means that they are not a firm requirement unless paired with another tool, such as DPAs. Additionally, there is often minimal incentive provided for the developers to adopt these guidelines unless a local government enforces the guideline during the development review phase.

To address these limitations, design guidelines could be paired with development permit areas (discussed earlier) to increase the enforceability of the guidelines as a developer must show adherence to the guidelines to obtain a development permit. Overall, this tool has been used by many local governments, though it has not been used by all local governments in BC for climate risks. As such, it provides a possible avenue for local governments to take an incremental step – of adding climate-related resilience measures – and convert this tool into one that promotes development that exceeds regulatory requirements for climate resilience. As such, design guidelines for housing adaptation to climate risks is an accessible and feasible policy tool that could be implemented by many local governments throughout BC.

4.2.1. Case study: City of Boston, USA

The [*2019 Coastal Flood Resilience Design Guidelines*](#) from the City of Boston provides an example of applying design guidelines to address climate adaptation in high-risk areas. The guidelines are operated by the Climate Change and Environmental Planning team within the City of Boston's planning department. This work was completed in collaboration with nonprofit advisors and consultants, including planners, urban designers, lawyers, engineers, economists, and landscape architects. The work was funded through a federal grant.

The coastal flood design guidelines first aim to inform residents and developers on the City's flooding risks, including future floodplain maps with anticipated flood frequency. The guidelines then provide examples of strategies for new development and retrofits

that can support adaptation efforts. The strategies clearly outline technical consideration and where applicable co-benefits such as adaptation to climate risks like extreme heat.

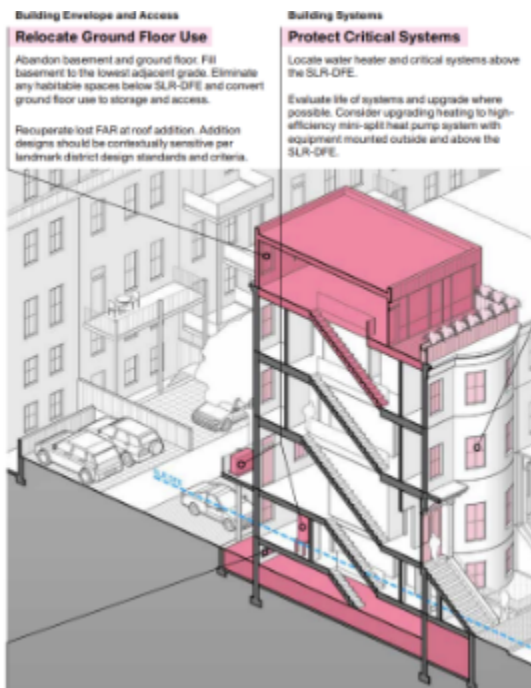


Figure 5. City of Boston Coastal Flood Resilience Design Guideline for Attached Townhouse²⁴.

Local Examples

The [Regional District of Central Okanagan](#) (RDCO) provides design guidelines for rural developments that are located within the wildfire development permit area. These guidelines provide minimum examples of the district's requirements for roofing materials, exterior wall finishes, and landscaping. Similarly, for development applications within the wildfire DPA, the [City of Maple Ridge](#) requires a completed checklist showing how the design complies with relevant local government design guidelines. Neither of these guidelines themselves are legally required; however, they are enforced through development permits, which will not be granted if the development does not meet the minimum measures outlined in the guideline.

4.3. Recommendations

Housing is a cross-jurisdictional sector where both local and provincial governments can contribute to adaptation efforts. Both voluntary of the policy tools outlined above require more information on the spatial distribution of climate risks to understand where higher

²⁴ Boston Planning & Development Agency. (2019). Coastal Flood Resilience Design Guidelines. Page 75.

building standards should be encouraged or required. This is also relevant for pre-approved building plans as local governments must understand which climate risks are to be included in the design. Building plans must be approved by local governments and should therefore be implemented by them. Design guidelines could be created by either level of government and would have more impact at the provincial scale; however, they are most enforceable when paired with a DPA and therefore would also need to be implemented by local governments.

Provincial:

- Complete the provincial disaster and climate risk and resilience assessment to provide information to local governments regarding the spatial distribution of climate risks in their jurisdiction, so that they can develop housing materials that are relevant to their climate risks.
- Provide funding for local governments to retain qualified professions to develop climate resilient building plans that suit their local context,
- Integrate adaptation principles into [*BC's 2024 Standardized Housing Designs Catalogue*](#).
- Develop design guidelines for climate resilience to different hazards (e.g. the [*FireSmart Home Development Guide*](#)), that could be referenced by local governments to apply to a development permit guideline. Compile and distribute example design guidelines for climate hazards in BC, such as the examples provided for sea level rise in the [*Sea Level Rise Adaptation Primer: A Toolkit to Build Adaptive Capacity on Canada's South Coasts*](#).

Local government:

- Oversee the development and distribution of pre-approved residential design plans to ensure that they are aligned with the local context.
- Develop design guidelines for local climate risks and consider pairing them with a DPA to increase enforceability.
- Regional governments might consider leading the development of standardized residential design plans that suit the regional risk context and provide them to partner municipalities for adjustment to municipal development bylaws and then pre-approval.

- Review existing standardized housing designs catalogue and adapt them to suit the local context, including development bylaws and location-specific climate hazards.
- Reference existing design guidelines for risk-specific considerations and integrate them into development permit guidelines.

5. Conclusion

BC's land use planning system is at a pivotal moment. Climate impacts are accelerating, and without coordinated, risk-informed planning, development patterns will continue to place people, infrastructure, and ecosystems in harm's way. The analysis across impact assessments, urban growth boundaries, and housing design demonstrates that BC possesses many of the foundational tools needed for climate-resilient land use planning, but lacks a coherent, province-wide framework that ensures their consistent and effective application. Current practices remain uneven across jurisdictions, and local governments face significant capacity constraints in hazard mapping, risk assessment, and long-term growth management.

BC can significantly reduce long-term climate risk by strengthening provincial mandates, standardizing risk-informed planning requirements, expanding hazard-based land protections, and supporting local governments with data, funding, and adaptable policy tools. Implementing the report's recommendations—such as requiring strategic climate risk assessments, mandating sequential-test-style approaches for siting development, expanding DPAs for natural hazards, and supporting resilient housing design—will help ensure that growth occurs in the lowest-risk areas and that communities are better protected from future climate impacts.

With the updated Emergency and Disaster Management Act and the launch of the Disaster and Climate Risk and Resilience Assessment (DCRRA), BC has already begun this transition. Advancing the next phase—through coordinated, province-wide policy action—will enable BC to shift from reactive disaster response to proactive, climate-resilient land use planning, strengthening safety, sustainability, and long-term resilience across the province.