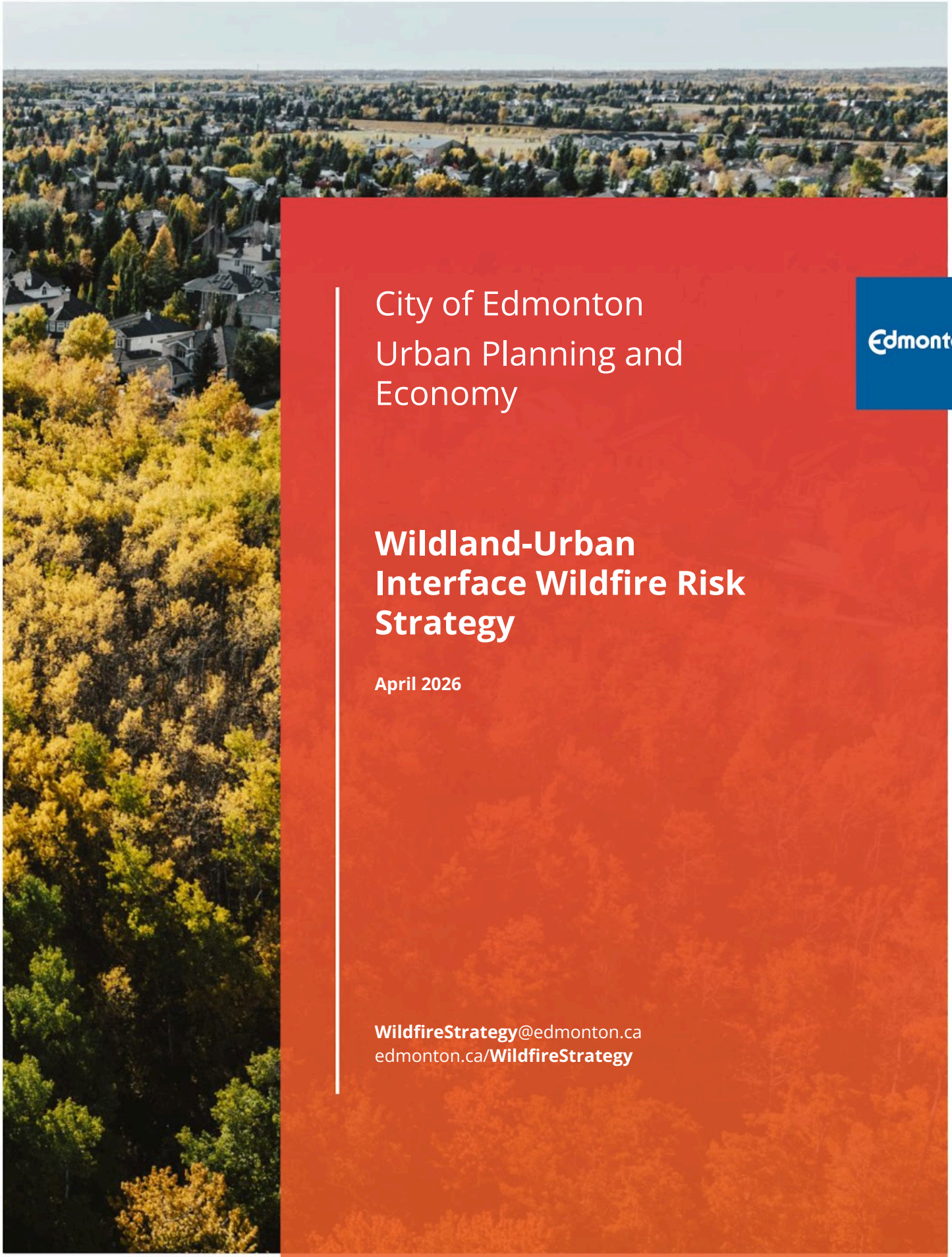

City of Edmonton

Urban Planning and Economy

Wildland-Urban Interface Wildfire Risk Strategy

April 2026

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Land Acknowledgement

The City of Edmonton acknowledges the traditional land on which we reside, is in Treaty Six Territory. We would like to thank the diverse Indigenous Peoples whose ancestors' footsteps have marked this territory for centuries, such as nêhiyaw (Nay-hee-yow) / Cree, Dene (Deh-neyh), Anishinaabe (Ah-nish-in-ah-bay) / Saulteaux (So-toe), Nakota Isga (Na-koh-tah ee-ska) / Nakota Sioux (Na-koh-tah sue), and Niitsitapi (Nit-si-tahp-ee) / Blackfoot peoples. We also acknowledge this as the Métis' (May-tee) homeland and the home of one of the largest communities of Inuit south of the 60th parallel. It is a welcoming place for all peoples who come from around the world to share Edmonton as a home. Together we call upon all of our collective, honoured traditions and spirits to work in building a great city for today and future generations.

Executive Summary

Wildfire activity across Canada is increasing as climate change drives longer, hotter, and drier fire seasons. Recent wildfire events impacting Alberta communities have illustrated the high cost and widespread disruptions wildfire can cause, reinforcing the urgency of taking proactive measures to address wildfire risk. Concerns have risen in Edmonton regarding the number of wildfire ignitions in the wildland-urban interface (WUI), where natural areas meet human development. This wildfire risk is expected to worsen with continued climate change and urban growth.

The City of Edmonton recognizes the rising risk of wildfire and has been taking active steps to manage this risk. Edmonton benefits from a world-class fire service, established training programs for WUI response, strong emergency management systems, and an emerging suite of technological tools that support early detection and coordinated fire response. These capabilities provide a strong foundation upon which the City will build a more integrated whole-of-society approach to wildfire resilience. The City of Edmonton's inaugural WUI Wildfire Risk Strategy (the Strategy) represents the first major step to becoming a wildfire-resilient city.

The Strategy provides a coordinated, evidence-based approach to managing wildfire risks. It responds to three primary drivers: a changing climate, accumulated wildland fuels, and continued urban growth in the WUI. Through coordinated action across departments, key partners and the community, Edmonton can proactively reduce wildfire risk, improve preparedness and safeguard the people, infrastructure and natural areas that define the city.

The Strategy serves as the primary framework for managing wildfire risk in Edmonton, guiding long-term efforts and priorities. It aligns closely with guidance provided by FireSmart Alberta and the Canadian Guide for Wildland-Urban-Interface Fires. It integrates lessons from leading Canadian and international jurisdictions, and reflects the City's broader climate resilience, emergency management, parks and natural areas, and land use planning frameworks.

1. Introduction

The Edmonton region is warming at nearly twice the global average. This increase in temperature, along with changing precipitation patterns, is driving a trend toward longer and more severe fire seasons [1], [2]. Recent wildfire activity has shown a dramatic increase, with the 2023 season representing Canada's most destructive on record, burning more than 17 million hectares of land [3]. Smoke from these events affected communities nationwide, including 24 days of high-risk air quality in Edmonton [2].

The growing scale and intensity of wildfires have made them some of the costliest natural disasters in Canadian history [3]. In 2024, the wildfire in Jasper, Alberta, destroyed roughly one-third of the community and caused an estimated $1.3 billion in insured losses [4]. The 2016 Horse River wildfire in Fort McMurray resulted in over $3.7 billion in insured losses and up to $10 billion in broader economic impacts. These disasters illustrate not only financial risk but also the long-term disruption to community identity, local economies, and resident well-being.

While Edmonton has not experienced a significant wildfire event similar to the other communities mentioned above, an extensive urban parkland, continued urban growth, and changing wildfire behaviour had led the City to take a proactive and coordinated approach to risk reduction, especially in areas where homes, infrastructure, and natural landscapes meet. These converging areas of human development and natural areas are called the Wildland Urban Interface (WUI).

Edmonton is well-positioned to adapt to the increasing scale and intensity of wildfires and the risk of wildfire in the WUI. The City benefits from a world-class fire department and established vegetation management programs, providing a strong foundation for a broader, long-term approach to wildfire resilience. The City of Edmonton's WUI Wildfire Risk Strategy builds on this foundation by expanding from fuel mitigation to a whole-of-society model aligned with FireSmart principles (see **Box 1**). This approach integrates land use planning, emergency preparedness, infrastructure resilience, and public education to reduce risk at the municipal, neighbourhood, and property levels.

By coordinating efforts across City departments, partners, and residents, Edmonton can strengthen its resilience to current and future wildfire threats, protecting people, property, and the natural landscapes that define the city.

Box 1: Introduction to FireSmart

FireSmart is a comprehensive approach to reducing wildfire risk across Canadian communities. Its programs empower individuals, governments, and organizations to take proactive steps in wildfire prevention, preparedness, and mitigation across seven disciplines, Including:

- **Vegetation Management:** Modifies or removes flammable vegetation to reduce fire intensity and spread.
- **Legislation:** Establishes bylaws and policies that support fire-resilient development.
- **Development:** Encourages fire-safe building materials and designs in new and existing buildings and neighbourhoods.
- **Education:** Raises awareness about wildfire risks and teaches prevention strategies.
- **Emergency Planning:** Develops community-level wildfire preparedness and emergency response plans.
- **Cross Training:** Prepares emergency responders through joint training and shared protocols.
- **Interagency Cooperation:** Fosters collaboration among agencies for unified wildfire response.

For more information, visit the provincial chapter website at firesmartalberta.ca. [5]

1.1 Vision and Guiding Principles

The strategy is defined by the following vision statement:

Edmonton is dedicated to building a resilient city where communities, infrastructure and ecosystems are protected from wildfire risks through proactive mitigation planning, community-driven FireSmart practices, and a coordinated emergency response.

The following guiding principles will be upheld to achieve the vision for ongoing wildfire resilience in Edmonton (**Figure 1**):

***Figure 1**: The WUI Wildfire Risk Strategy's Guiding Principles.*

1.2 Strategic Pillars

The Strategy includes recommendations for risk mitigation and adaptation actions, split into four pillars to build a wildfire-resilient community. Each pillar supports a specific wildfire resilience goal or outcome and includes one or more action plans targeting each of the seven FireSmart disciplines. The strategic pillars include:

+ **Reduce:** Minimize the potential for wildfire ignition and spread in and around Edmonton's WUI through vegetation management, planning, and regulation. This includes action plans for vegetation management, legislation, and development disciplines.

+ **Educate**: Increase wildfire awareness and preparedness by engaging the community, providing accessible information, and supporting local initiatives. This includes an action plan for the education discipline.

+ **Respond**: Support integrated emergency responses and wildfire training across City departments. This includes an action plan for emergency planning and cross training disciplines.

+ **Coordinate**: Collaborate with neighbouring jurisdictions and external agencies to build regional resilience. This includes an action plan for the interagency cooperation discipline.

2. Development of the Strategy

The WUI Wildfire Risk Strategy was built upon a foundation of information gathering, analysis and recommendation development. These core activities determined the strategy's framework and defined the priority actions for wildfire risk mitigation and adaptation for the City to implement.

+ **Information Gathering (outlined in Section 3 Background on Wildfire Risk Management in Edmonton):** Information was gathered through a background review of existing initiatives to understand and manage wildfire risk in Edmonton, as well as a robust public engagement campaign. A review of current municipal plans, policies and ongoing initiatives, along with federal and provincial legislation and guidance, formed the basis for understanding the current context for wildfire resilience planning. This context was further assessed through a jurisdictional scan that compared leading practices in wildfire risk management from six municipalities with relatable geographical and/or regulatory conditions to Edmonton (see **Appendix A.1** for more information).

+ **Analysis (outlined in Section 4 Wildfire Risk Environment):** Wildfire exposure modeling and mapping were completed to identify hazardous wildland vegetation and the potential areas where wildland fires could impact Edmonton's built environment. An analysis of projected changes in Edmonton's climate also informed how wildfire risk is likely to change over the coming decades. The mapping and climate analysis informed recommendations for vegetation management, policies and regulation guiding growth and development, and emergency planning.

+ **Recommendation Development (outlined in Section 5 Wildfire Mitigation and Adaptation):** Wildfire risk mitigation and adaptation actions and recommendations are based on Edmonton's wildfire risk environment, priorities identified through public engagement, and leading practices in wildfire management identified through the jurisdictional scan. Recommendations are grouped into four action areas in alignment with the Strategic pillars presented in **Section 1**. Each pillar encompasses one or more of the FireSmart disciplines with specific action plans developed for each discipline.

More information on the methodology used for all processes to develop the Strategy is provided in **Appendix A.** Together, the components of the Strategy enable the City to proactively manage WUI wildfire hazards, strengthen community resilience, and align municipal efforts with evolving climate adaptation priorities.

3. Background on Wildfire Risk Management in Edmonton

This section provides context information to understand the WUI in Edmonton, the City's initiatives to manage wildfire risk in the WUI, and the current planning practices and regulations that could be used to enhance wildfire management. This information sets a foundation for understanding the current priorities and opportunities to improve wildfire risk management in Edmonton, helping to identify actions that will move the city toward a more comprehensive and integrated wildfire management approach.

3.1 Edmonton's Wildland-Urban Interface

The WUI in Edmonton includes the areas where developed neighbourhoods converge with natural landscapes such as forests, grasslands and parkland that are considered combustible fuel for a fire. Unlike rural or remote communities, where the WUI often consists of a clear delineation between dense forest and human settlement, Edmonton's interface is more complex and interwoven. Edmonton has the largest stretches of urban parkland in North America, with ribbons of green space following the North Saskatchewan River and ravine system. The North Saskatchewan River and connected ravines account for the vast majority of Edmonton's WUI, at roughly 7400 hectares [6]. Other smaller patches of forest, grassland, and parks also contribute to the occluded WUI, which references patches of fuel vegetation surrounded by development, particularly on the outskirts of the city. This mosaic of urban development and wildland areas creates multiple points where residential, commercial, and industrial areas could be exposed to wildland fires. **Figure 2** shows an overview of wildland areas in Edmonton, including types of vegetation present and the city and planning district boundaries.

Note that while agricultural lands are not shown on the map, they present seasonal fire hazards in early spring, late summer, and fall when dry crop material is susceptible to ignition. Maps showing agricultural fuel hazards are presented in **Appendix D**. While fewer structures are typically seen in agricultural areas on the outskirts of the city, emergency response is still required to control/extinguish fires. The relative remoteness of these areas is important to consider to ensure adequate response times.

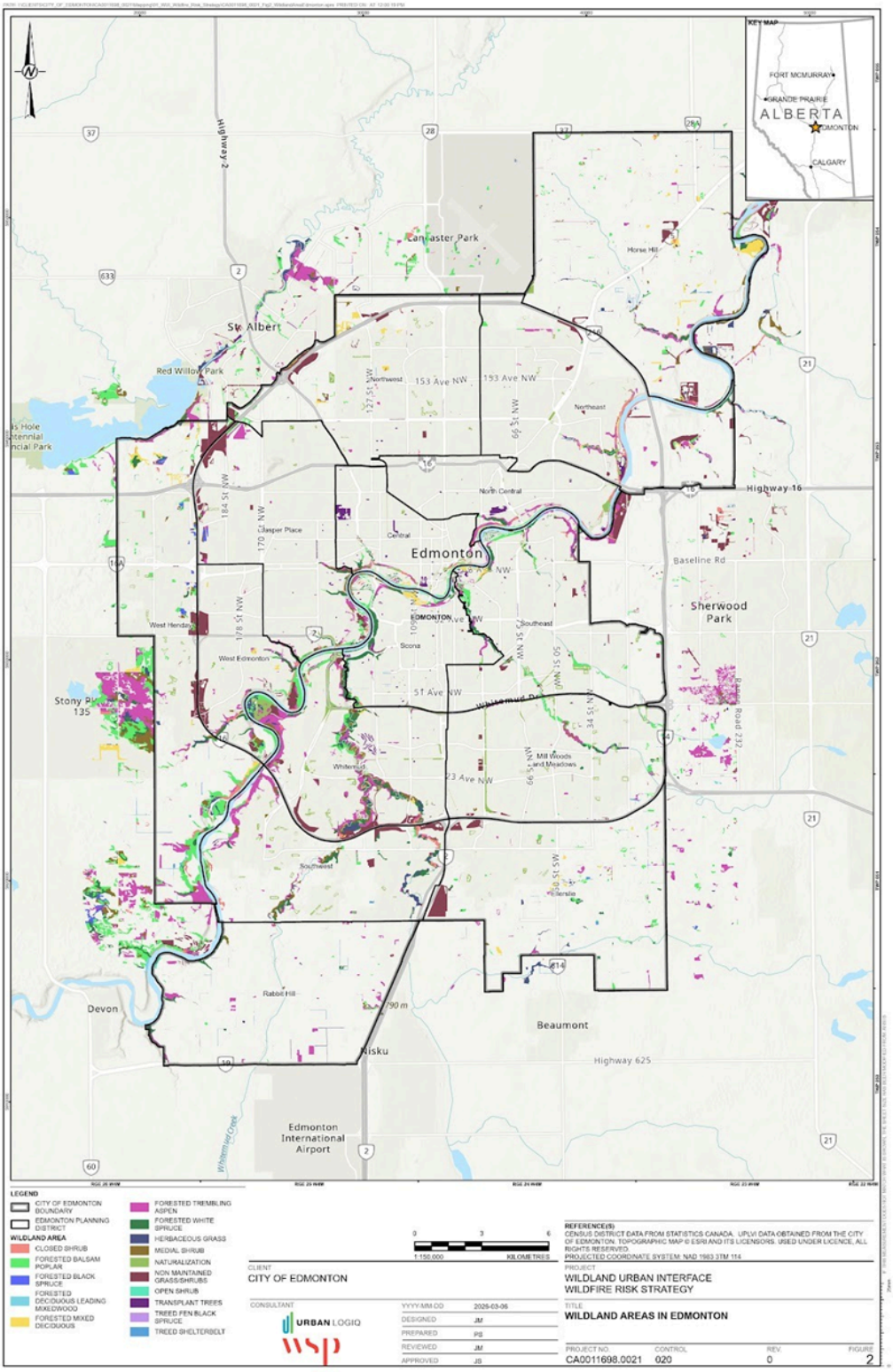

***Figure 2**. Wildland Areas in Edmonton*

Edmonton is located in the central parkland region, a transition area between the northern edge of the prairie and the southern boreal forest ecozones. This area is characterized by patchy forests and shrublands mixed with open grasslands. Forest stands are generally rich with deciduous trees such as aspen and birch, though coniferous species, notably white spruce, are also common and present a higher fire hazard.

Since time immemorial, Indigenous communities from Treaty 6 territory have practiced traditional fire stewardship to manage the landscape, reduce wildfire risk, and promote ecological regeneration. These intentional, cultural burns reflect a deep reciprocal relationship with the land. When settlers arrived, they encountered a landscape actively managed by Indigenous peoples who used fire to influence and maintain the region's fire regimes.

Subsequent colonization and the systematic suppression of fire as a land management tool fundamentally altered these patterns. The wildfire regime in the Edmonton region is now characterized by a mixed-severity fire pattern, with both low-intensity surface fires and occasional high-intensity crown fires occurring in the surrounding forests. Parkland fires generally consist of low-intensity grass and surface fires, while boreal fires tend to be high-intensity, stand-replacing fires [7].

This regime is currently influenced by seasonal weather conditions, fuel availability, and modern land management practices. Fire frequency typically ranges from every few decades in parkland areas to every 30–200 years in the boreal forest. However, the legacy of fire suppression has resulted in accumulated fuel loads that continue to pose the risk of larger, more severe wildfire events.

In recent years, grass and brush fires within the WUI have been a common occurrence in the river valley and ravine system, often starting during the early spring following snowmelt when dead vegetation is accumulated on the ground [8]. Given the high population density of the city and intensive recreational use in wildland areas, most fires occurring within the city limits are human-caused, though lightning-caused fires are also possible.

Unauthorized WUI fires present critical ignition risks and management hurdles. Because encampment residents can be both contributors to and victims of this risk, an inclusive strategy is essential to manage WUI wildfires and safeguard vulnerable communities.

The increased frequency and severity of wildfires across Canada have served as both a warning and a catalyst for municipalities to reevaluate their approach to wildfire risk. As Edmonton continues to grow and climate change intensifies, it is essential to develop targeted actions that protect people, property, and the natural environment.

3.2 Recent Wildfire Mitigation Initiatives

Municipalities play a pivotal role in managing wildfire risk by coordinating prevention, preparedness, and response at the local level. **Table 1** presents a summary of current and recent initiatives undertaken by the City to understand and

mitigate wildfire risks in the WUI. Initiatives have been grouped by FireSmart discipline.

While these initiatives have started to address many priority areas related to managing wildfire risk in Edmonton's WUI, many initiatives have been short-term or pilot-based, highlighting the need for a more sustained and integrated approach to wildfire risk management. The WUI Wildfire Risk Strategy represents an opportunity to build off past successes and lead a unified, whole-of-society approach to wildfire risk management.

3.3 Planning and Regulatory Framework

There are several core planning documents that support wildfire mitigation and preparedness for Edmonton. These municipal documents, along with key provincial, national, and international guidance and legal frameworks for wildfire risk, shape an understanding of how the City of Edmonton can influence wildfire preparedness within its jurisdiction. These policy, regulatory, and guidance tools also provide a foundation for aligning the City of Edmonton's priorities with standard practices that inform the development of risk mitigation strategies outlined in **Section 5**.

3.3.1 City of Edmonton

The City of Edmonton has a robust planning and regulatory framework that can be applied to wildfire risk management strategy development and integration. This framework includes city-level strategic planning, climate resilience planning, urban forest management, and emergency preparedness. Below is a summary of the critical plans, policies, and initiatives that are relevant to wildfire risk management in Edmonton (**Table 2**).

Table 1. *Current Wildfire Risk Management Initiatives in Edmonton*

Initiatives	Project/Description
Vegetation Management	+ **Prescribed burning** by expanding ecologically sensitive controlled burns to reduce surface fuels, and restore fire-adapted ecosystems + **Targeted Fuel Reduction** via mechanical treatments (e.g., pruning lower branches on coniferous trees, removal or spreading of fallen and piled woody debris) **Drone monitoring** of vegetation and fire hazards in the river valley to support ongoing information gathering and data-driven planning.

Initiatives	Project/Description
Emergency Preparedness **Cross Training** **Interagency Cooperation**	+ **Edmonton Fire Rescue Service (EFRS) wildfire suppression training** for all new firefighters to prepare for wildfires. + **A WUI tabletop exercise** simulated wildfire scenarios to test interagency coordination and emergency protocols. + **Formalized mutual aid agreements** with neighboring municipalities to boost regional response capacity. + **Development of the EmberWise tool**, which will use geospatial and behavioral data to identify high-risk areas in real time for emergency preparedness and response planning. + **Deployment in a Wildfire Scenario** to respond and recover from disasters and emergencies
Education	+ **FireSmart presentations** to internal and external interested parties to promote wildfire awareness. + **Support for communities to complete the FireSmart Neighbourhood Recognition Program,** which recognizes residents' efforts to successfully adopt FireSmart principles. + **Social Media promotion of FireSmart.**
Legislation **Development**	+ **Landscape standards update** within Volume 5 of the City's design standards to include fire-resistant landscaping standards. + **Land use policy mechanisms** in the Climate Resilience Planning and Development (CRPD) Action Plan: ○ Action 6 - Introduce new regulations for wildfire risk areas in the Zoning Bylaw. ○ Action 7 - Incorporate climate resilient standards into the ○ City's Design and Construction Standards ○ Action 8 - Pursue opportunities to bolster climate action through policy, regulatory and other planning tools ○ Action 12 – Develop a Climate Risk Index for Edmonton neighbourhoods.

***Table 2**. Edmonton's Core Planning Documents Supporting Wildfire Risk Management*

Document	Key Relevance to Wildfire Risk Management
Strategic Direction and Policy Integration	
ConnectEdmonton	Establishes climate resilience as a City-wide strategic priority, supporting high-level integrated wildfire risk management into strategic planning.

Document	Key Relevance to Wildfire Risk Management
The City Plan	Indirectly supports wildfire resilience by prioritizing infill development policies that limit urban sprawl into wildland areas. Proposes expanding firefighting coverage, improving wildfire response capabilities. The plan does not directly address wildfire but supports resilience through the following actions: + 2.3.1 Promote opportunities to accommodate growth through the compact development of new and existing neighbourhoods. + 2.4.1 Support ecological function and energy efficiency of Edmonton's built environment. + 2.4.2 Ensure public buildings and infrastructure are sustainable and resilient. + 5.4.1 Ensure the safety and security of Edmonton's water supply, food systems, infrastructure, and natural systems to support long-term resilience to flooding, droughts, and extreme weather events. + 5.4.2 Ensure rapid support to Edmontonians in times of emergency, disaster, and crisis.
Corporate Business Plan (2023–2026)	Aligns short-term operations with strategic goals for safety and climate adaptation, indirectly addressing wildfire preparedness.
District Policy and 15 District Plans	The district policy and associated plans include: + Hazard Policies + Climate Adaptation Policies + Supplemental maps for the district plans. The context map identifies hazards such as flood but does not currently show wildfire risk areas.

Document	Key Relevance to Wildfire Risk Management
Zoning Bylaw	Section 3.6.5 Edmonton South Special Area regulates areas annexed in 2019 from the County of Leduc. Provisions from the County's Land Use Bylaw were carried over into Edmonton's Zoning Bylaw, agreed upon through the annexation process. Section 3.6.5.13 outlines Wildfire Provisions for Development applications in or adjacent to Wildlands. Wildlands are defined in the Edmonton South Special Area as an area of uncultivated land that is primarily covered with trees, bushes, or wild grasses and left in a natural or near-natural state. The Wildfire Provisions enable Development Planners to: + Circulate the development application to Edmonton Fire Rescue Services. + Ask for information on listed development features. + Require a wildfire hazard assessment. + Add vegetation removal and the use of non-combustible materials on the building's exterior as conditions for approval. + Increase setbacks for buildings from wildlands to create adequate defensible space.
Climate Resilience and Adaptation	
Climate Resilient Edmonton: Adaptation Strategy and Action Plan	Directs climate risk assessments for city infrastructure, integration of adaptation standards into development, and community readiness planning, providing some high-level information related to wildfire. Currently under revision.
Climate Resilience Planning and Development Action Plan (2024–2026)	Establishes 15 priority actions to enhance climate resilience throughout the City of Edmonton's Planning and Development continuum. Relevant actions for wildfire resilience include: + Action 6 - Introduce new regulations for wildfire risk areas in the Zoning Bylaw. Regulate development in WUI areas. + Action 7 - Incorporate climate resilient standards into the + City's Design and Construction Standards + Action 8 - Pursue opportunities to bolster climate action through policy, regulatory and other planning tools + Action 12 - Develop a Climate Risk Index for Edmonton neighbourhoods.

Document	Key Relevance to Wildfire Risk Management
C627 Climate Resilience Policy	Establishes three areas for urgent action on climate change. Action 2 directly supports efforts to manage wildfire risk in the WUI: + Act to reduce emissions by 35% by 2025 and 50% by 2030 and be a carbon-neutral community by 2050 through Energy Transition to help limit global warming to 1.5 degrees Celsius. + Act to adapt, prepare for, and respond to a changing climate. + Lead climate solutions in service delivery and corporate management.
Natural assets Management	
Urban Forest Management Plan	Includes one long-term strategy related to reviewing the FireSmart program as part of a risk assessment for the natural forest and tree stands in the city.
City-Wide Natural Area Management Plan	Provides information to reduce human-caused fires and outlines general fuel reduction options. The primary focus of the document is on habitat preservation.
Top of Bank Policy (Policy C542 - Development Setbacks from River Valley/Ravine Crests)	Defines the Wildland-Urban Interface (WUI). Establishes setback requirements for development near riverine areas. Enables the registration of Restrictive Covenants by way of a caveat on the title of properties backing onto the top of bank that describe building restrictions and other restrictions necessary to protect both urban development and the river valley and ravine system. Explains that the terms and restrictions of a Restrictive Covenant may include a restriction based on the recommended guidelines for Priority Zone 1, from the 2003 resource FireSmart: Protecting your Community from Wildfire.
Volume 5 Landscaping Design and Construction Standards	The Volume 5 Landscaping Design and Construction Standards specify that landscape developments on city lands provide well-constructed, functional, aesthetically pleasing, and sustainable public open space. They dictate how to plant in Top of Bank, Municipal Reserve, and Environmental Reserve areas.

Document	Key Relevance to Wildfire Risk Management
Breathe: Green Network Strategy	A strategy that helps guide City planning to ensure all neighbourhoods are supported by high-quality, accessible, connected open spaces. It provides direction on how to maintain parks, open spaces, and the public facilities, amenities, and equipment within them to a level of quality that does not place the public at risk of danger or injury.
Ribbon of Green Strategic Plan	This strategic plan provides policy direction to guide the planning, programming and management of Edmonton's North Saskatchewan River valley and ravine system. These policies include supporting guidance on wildfire Risk and include: + 2.1.7 g): Assess the risk posed by wildfires to amenity nodes, facilities, and adjacent development, and mitigate where feasible. Undertake research and develop techniques to address the wildland-urban interface (the transition between wildland and human development). + 3.4.9.2 ab): Ensure that public facilities are adequately protected from wildfires and flooding. + 3.4.11.2 y): Ensure that facilities are adequately protected from wildfires and flooding.
North Saskatchewan River Valley Area Redevelopment Plan	The plan builds upon and refines the planning policies, objectives, and requirements of the City Plan to set a general land use pattern for the North Saskatchewan River valley and ravine system. The objective is to guide the City in protecting and restoring natural assets in the river valley and ravine system in the context of land use planning and decision-making.
Emergency Management	
The Municipal Emergency Management Plan (2025)	Provides high-level processes for emergency response and is updated annually. Does not explicitly address wildfire but provides processes for evacuation planning and hazard assessment.

3.3.2 Province of Alberta

Beyond the City's jurisdiction, there are several provincial and federal-level programs and regulations to help municipalities reduce wildfire risk (**Table 3**).

FireSmart Canada is a national program coordinated by the Canadian Interagency Forest Fire Centre (CIFFC) that promotes wildfire resilience through education, planning, and community action. It provides a robust framework for reducing wildfire risk across the country, including guidelines for homeowners, municipalities, and industries. FireSmart Alberta operates as a provincial chapter aligned with the

national program, tailoring the FireSmart principles to Alberta's unique landscapes and wildfire challenges.

***Table 3**. Alberta Planning Documents Supporting Wildfire Risk Management*

Document	Key Relevance to Wildfire Risk Management
Alberta Wildland Urban Interface Guidelines	Focuses on integration and interoperability within the province's emergency management system. Provides emergency incident management parties with a common understanding of the organization and structures, processes, procedures, and terminology used for WUI incidents.
Municipal Government Act (MGA)	Requires municipalities to enact a Municipal Development Plan and Land Use Bylaw, which can be utilized to control, regulate, or prohibit development in WUI areas. Enables municipal councils to create other statutory land use plans subordinate to the Municipal Development Plan for specific geographic areas, which can address natural hazard mitigation.
Emergency Management Act	Provides the legislative framework for local and provincial management of emergencies and disasters. It outlines the roles and responsibilities of the Minister of Public Safety and Emergency Services, the provincial government, and local authorities.
Local Authority Emergency Management Regulation	Provides direction on emergency management roles and responsibilities and what is required of municipalities to plan and prepare for the safety of their community.
The National Building Code - Alberta Edition	Contains fire-resilient construction standards for new developments (not specific to wildfire). Specifies minimum fire protection measures and structure separation/setbacks (primarily for structure fires).
National Fire Code - Alberta Edition	An operation and maintenance document that explains how to care for buildings constructed under the Building Code. Outlines responsibilities for property owners and developers to comply with fire safety objectives. Provides some standards for firefighting equipment and management of flammable and combustible liquids.
Forest and Prairie Protection Act & Regulation (Alta Reg 60/2017)	Assigns responsibility for wildfire management outside the Forest Protection Area to municipalities. Enables fire control orders, cost recovery, and enforcement powers.
Alberta Wildfire Mitigation Strategy	A comprehensive framework designed to create a wildfire-resilient province by empowering a "whole-of-society" approach to long-term mitigation through collaboration and innovation.

The Municipal Wildfire Assistance Program (MWAP) is another provincial initiative administered by the Alberta Emergency Management Agency. MWAP provides financial support to municipalities outside the Forest Protection Area (i.e., urban communities) in the event of a wildfire requiring high costs for suppression and recovery. Because this program has a high per-capita cost threshold, it is best suited to small or midsized municipalities and is not well-suited to response efforts for a large municipality like Edmonton. Additional funding programs relevant to the City of Edmonton are discussed in **Section 5.2.**

In addition to the provincial programs offered above, the Government of Alberta supports municipalities in the management of wildfire risk through several regulatory and guidance documents. These documents are summarized in **Table 3** and provide context to understand legal gaps and opportunities addressed by the WUI Wildfire Risk Strategy.

3.3.3 Canada and International Contexts

The Government of Canada has developed several key guidance documents to help municipalities reduce wildfire risk, especially in WUI areas. International standards have also been developed to manage building practices in WUI areas. The following guidance documents and standards provide a technical foundation for this Strategy.

Canadian Wildland Fire Prevention and Mitigation Strategy (2024)
Published by the Canadian Council of Forest Ministers, this Strategy outlines a whole-of society approach to wildfire risk reduction. The plan aligns with the National Adaptation Strategy for climate resilience and supports the following priorities:

+ Collaboration across federal, provincial, municipal, and Indigenous governments for wildfire preparedness and response.
+ Integration of wildfire risk into land use planning and emergency management.
+ Investment in wildfire prevention and public education initiatives.

National Guide for Wildland-Urban Interface Fires (2021)

Developed by the National Research Council of Canada, this is the first national guide focused on WUI fire risk. It provides guidance and tools for municipalities related to wildfire hazard and exposure assessments, vegetation management, and fire-resilient construction standards, community planning, and emergency response. The guide largely draws on information developed by the National Fire Protection Association and the International WUI Code. The guide provides technical background intended to inform updates to the national building code. The guide is oriented for use by local government practitioners, including engineers, architects, planners, and policymakers, but notes that it can also be used to inform property owners and insurers. The guide provides a foundation for municipalities to manage wildfire risk through community and emergency planning.

Standard for Wildland-Urban Interface Fire Risk Mitigation in the Structure Ignition Zone (In Development)

The Standards Council of Canada is currently developing a new national standard (CAN/UL 2530), focused on fire risk mitigation in the structure ignition zone. The standard will include risk assessment methods, construction and retrofit requirements, and vegetation management guidance. This is the first national standard that could be adopted into local regulation as a compliance requirement in alignment with local building codes.

International WUI Code (IWUIC) (2024)

Developed by the International Code Council, the International WUI Code (IWUIC) establishes requirements for land use and the built environment within designated WUI areas using prescriptive and performance-based provisions. The goal of the code is to prevent ignition of buildings and vegetative fuels from direct exposure to wildfire and prevent structure fires in the WUI from spreading to wildland fuels. The code establishes regulations for ignition-resistant construction, defensible space, fuel modification, water supply, and access for emergency vehicles. The code provides three tiers of requirements for ignition-resistant construction. The code has been adopted by many jurisdictions at both state and municipal levels in the United States but has not been formally adopted by any Canadian jurisdiction.

3.4 Public Engagement Summary

In addition to ongoing public-facing engagements carried out by Edmonton Fire Rescue Services, the development of the WUI Wildfire Risk Strategy was informed by an intentional two-phase public engagement process designed to gauge risk perception, gather mitigation preferences, and refine proposed actions. This collaborative approach supported the Strategy in aligning with both technical requirements and community priorities.

Phase 1 focused on gauging public perception of wildfire risk, awareness of wildfire preparedness, and preferences for mitigation activities through surveys, workshops (including Indigenous organizations), presentations, and pop-up events. The input from this phase informed the Strategy's development and future implementation. Phase 2 involved targeted engagement on the draft Strategy, gathering feedback from key partners, through workshops and presentations, to directly refine the final Strategy version.

Both public engagement phases revealed that there is an overall concern of wildfire risk in Edmonton. Feedback highlighted the importance of reaching vulnerable populations, continuing Indigenous engagement, and fostering broader community education and collaboration. Prevention was seen as more cost-effective than emergency response, and strong support was shown for various wildfire resilience strategies in high-risk WUI areas, including site-specific vegetation management plans, land use planning mechanisms, and targeted public education programs.

For detailed information on the public engagement process, including a list of who was engaged, please refer to the What We Heard And Did Report.

4. Wildfire Risk Environment

This section provides an overview of the components of wildfire exposure and risk, and the factors considered to assess each for the development of this Strategy. More detailed descriptions of the methodology used for modeling and mapping wildfire exposure are provided in **Appendix A**. The results and key takeaways from the mapping and modeling exercise, along with a summary of wildfire risk in Edmonton and future projected changes in select environmental and climate conditions are provided below.

4.1 Factors Contributing to a WUI Disaster

Wildfire is a natural disturbance that, on its own, does not qualify as a disaster. However, problems arise when wildfires threaten valued assets like those that form towns and cities. If a wildfire enters the WUI, urban firefighting resources can be quickly overwhelmed, leading to rapid and extensive damage to the built environment. The goal of effective wildfire risk management is to prevent the spread of wildfire into developed areas and prevent the spread of structure fires into surrounding wildland areas, avoiding the WUI disaster sequence (**Figure 3**). Therefore, understanding wildfire exposure and risk depends on the characteristics of both the wildfire environment (wildland fuels, weather, and topography) and vulnerability of the built environment (susceptibility of structures to spread fires).

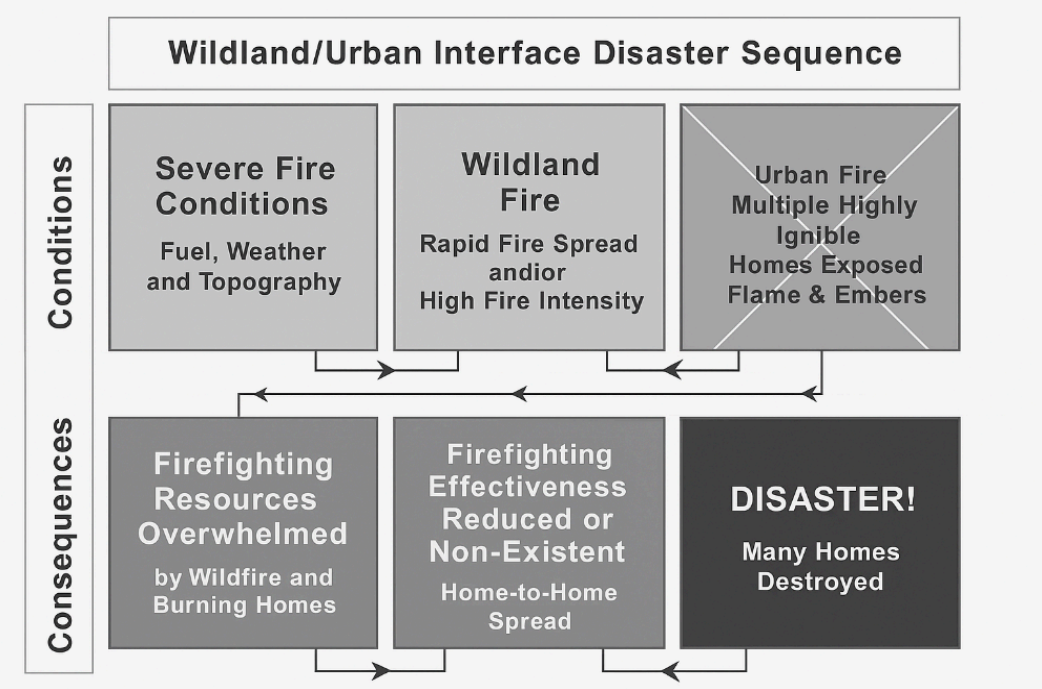

***Figure 3**. WUI Disaster Sequence [9]*

4.1.1 Wildfire Environment

Wildfire behaviour is shaped by three interconnected components: fuel, weather and topography. Each element influences how a wildfire is likely to spread and behave if ignited in a wildland area. Fuel is the foundation of wildfire hazard, while weather and topography are modifying factors that influence fire behaviour.

Fuel

In the context of wildfire, fuel refers to any combustible material that can sustain fire, including living and dead vegetation, trees, shrubs, grasses and accumulated organic debris. In Edmonton, wildland areas are dominated by mixed wood forest stands (coniferous and deciduous) and grasslands. These fuel types vary in their combustibility and structure, directly affecting wildfire behaviour. Important fuel types include:

+ **Mixed wood forest stands:** Edmonton's forests primarily follow the North Saskatchewan River valley and ravine system, with other notable patches in major highway corridors. These forests are generally dominated by deciduous trees but contain coniferous-leading stands as well. Areas with a mix of deciduous and coniferous trees present variable fire risk when alive and standing, with deciduous trees like aspen less flammable than coniferous trees like spruce and pine.

+ **Naturalization and shrubland areas:** Throughout the city, there are small naturalized and semi-maintained areas of transplanted trees and shrubland that present a notable fire risk. These areas generally exist along major roads, in industrial areas, and within underdeveloped or vacant properties.

+ **Grasslands and open spaces:** Grassy areas within and surrounding Edmonton can ignite easily, especially during periods of drought, leading to fast-moving surface fires. While these fuels are consumed quickly, the rate of spread can be challenging and dangerous for firefighters to manage and can quickly ignite nearby forest fuels or structures. Some grassland areas in the city exist around major roadways and infrastructure and are mowed periodically, but natural/unmaintained grassland areas are also common and may present a high fire risk in some areas.

+ **Agricultural areas:** Agricultural areas near the outskirts of the city present a seasonal fire hazard when accumulated grass or dead crop material dries out in the early spring and autumn. These fuels can contribute to low-intensity but fast-moving surface fires similar to those in low maintenance or seasonally mowed grasslands.

Accumulation of deadfall, leaf litter, and undergrowth further increases fuel availability, particularly in low maintenance or naturalized green spaces. The built environment bordering the WUI can also introduce additional fuel sources through low maintenance vegetation, invasive weeds, and combustible building materials.

Weather

Weather conditions are a critical driver of wildfire hazard, influencing ignition, spread, and intensity. Edmonton's climate is characterized by warm, dry summers, periodic droughts, and variable wind patterns. Conditions that can significantly elevate fire risk during peak wildfire season include:

- **Temperature and humidity**: Prolonged periods of high temperatures and low humidity dry out fuels, making them more susceptible to ignition.
- **Precipitation and drought:** Edmonton receives moderate annual precipitation, with rain and snow unevenly distributed throughout the year, resulting in dry spells that increase wildfire hazard.
- **Wind:** Wind can rapidly drive fire spread, carrying embers and igniting spot fires ahead of the main fire front. Edmonton frequently experiences strong, gusty winds, particularly during frontal passages and storms.

Seasonal weather variability, including early spring snowmelt and late summer heat waves, can lead to extended periods of heightened wildfire risk. The Fire Weather Index (FWI), which represents how likely a wildfire is to start and spread based on weather conditions, considers temperature, precipitation, relative humidity, and wind. Climate change projections indicate the potential for increasing favourable conditions for wildfires starting and spreading (see further discussion about climate change in **Section 4.2**).

Topography

Topography (including slope, aspect, and landscape features) influences wildfire spread by affecting wind patterns, drainage, fuel moisture, and the movement of fire itself.

- **Slope**: Fire moves faster uphill by preheating and drying upslope vegetation. Embers may also travel further when blown from upslope locations into low-lying areas.
- **Aspect**: Sun exposure influences vegetation types, growth rates, and overall fuel loading/availability.
- **Landscape Features:** Features like ridges, valleys, and water bodies can act as barriers or modify how wildfire spreads.

Edmonton is situated on generally flat to gently rolling terrain, with the North Saskatchewan River valley and ravine system providing notable variations in elevation. While steep slopes can accelerate fire spread through preheating upslope vegetation, Edmonton's moderate topography and high level of urbanization mean that large-scale fire movement is less influenced by topography than in more rural, mountainous regions.

Overall, while Edmonton's topography does not create extreme fire behaviour, local variations such as valleys and escarpments can influence fire dynamics over fine scales and present unique challenges for emergency response. These topography

changes are primarily a consideration for emergency planning around the North Saskatchewan River valley and ravine system, which represents most of the WUI in Edmonton, with almost all development upslope of wildland fuels.

4.1.2 Built Environment

Other important factors in understanding wildfire exposure are the structure and characteristics of the built environment that may allow a fire to spread from wildland areas into developed neighbourhoods, or from developed properties to wildland areas. The characteristics of the built environment and the proximity of assets to wildland fuel are key factors influencing the potential for a wildfire disaster to occur. Site landscaping, construction materials, and structure density all play a role in determining the susceptibility of assets to wildfire. Developed areas with a high structure density, combustible building materials (e.g., wood siding), and overgrown or combustible landscaping present a high risk of fire ignition and spread.

When a fire spreads rapidly through the built environment, igniting multiple structures simultaneously, this is known as an urban conflagration. This phenomenon is often initiated by ember showers or radiant heat and can escalate quickly, overwhelming firefighting resources, if there is insufficient separation or defensible space between combustible structures.

While this characteristic of the built environment is an important factor influencing WUI fire behaviour, it is highly dependent on site-specific conditions and difficult to accurately assess over a large spatial scale. Therefore, the configuration of the built environment is not considered for the assessment of wildfire exposure within this Strategy, though recommendations are provided in **Section 5** on WUI wildfire risk mitigation and adaptation for managing risk related to the built environment. The wildfire exposure assessment that follows focuses on understanding the potential extent for wildland fires to transition into developed urban areas.

4.2 Wildfire Evolution with Climate Change

Climate change is driving trends toward warmer temperatures and shifting precipitation patterns that will have a direct impact on the availability of combustible fuel sources and the weather conditions that support fire ignition and spread. This section presents projected trends in climate indicators and their likely impact on fire season length and intensity in Edmonton. More detailed information about climate modeling and the climate models used for this assessment is provided in **Appendix A.4.**

4.2.1 Projected Changes to Climate

To summarize the projected changes in wildfire, **Table 4** outlines the changing climate hazards, the associated climate indicators, and their relevance to wildfire exposure. A summary of key trends in climate model projections for each indicator follows. All climate projections presented are developed under Shared Socioeconomic Pathway 5-8.5 (SSP 5-8.5), which is a high greenhouse gas emissions scenario representing a high emissions, fossil-fuel intensive scenario useful for understanding climate extremes.

The figures that follow provide projections for the median value of climate indicators for three time horizons, the historical baseline (1991-2020), the 2030s (2021-2050), and the 2050s (2041-2070).

Temperatures are projected to increase across the City of Edmonton for all future modelled time horizons relative to the baseline period. The annual mean daily temperature is projected to increase by 3.0 °C, while the annual maximum temperature is projected to increase 3.9 °C by the 2050s time horizon. As a consequence of this increase, the number of days with temperatures greater than 30 °C is projected to increase by 19 days. Similarly, heat waves are projected to increase in both number and duration. Temperature projections are provided in **Figure 4**.

As temperatures rise, the likelihood of extreme fire weather conditions (including increased evaporation and drier fuels) increases, leading to longer fire weather seasons and more intense wildfires [1], [10]. Increased nighttime temperatures, which are also projected to occur, may also pose a unique challenge for traditional firefighting approaches, as nighttime cooling tends to lower fire intensity, which may be less pronounced in the future [11].

Table 4. *Climate Hazards, Indicators, and Relevance to Wildfire*

Climate Hazard Category	Selected Climate Indicator	Relevance of Climate Indicator to Wildfire
Temperature	Annual Mean Daily Temperature	Warmer temperatures result in an increased evaporation from the soil and potential fuel sources. Temperature projections provide an indication of how evaporation will change in the future.
	Annual Maximum Temperature	
	Longest Heat Wave	
	Days Above +30 °C	
Precipitation	Annual and Season Total Rain	Total rain provides information on the amount of rainfall expected into the future. Less rain would result in drier fuel sources.
	Annual and Season Total Snow	Total snow provides information on snowpack. Changes in snowpack affect spring runoff and the amount of moisture available to potential fuel sources.

Climate Hazard Category	Selected Climate Indicator	Relevance of Climate Indicator to Wildfire
Drought	Dry Days (Precipitation Below 1 mm)	Drought parameters provide an indication of the change in the number of days without significant precipitation (dry days). More dry days would result in drier fuel and an increased likelihood of wildfires.
	Longest Spell of Dry Days (Precipitation Below 1 mm)	
Fire Weather	Fire Season Length	The Fire Weather Index (FWI) considers meteorological parameters and provides information on the changes to the likelihood of a wildfire occurrence. The FWI includes consideration of wind conditions.
	Maximum Fire Weather Index (FWI)	
	Days with FWI above 5	
	Days with FWI above 10	

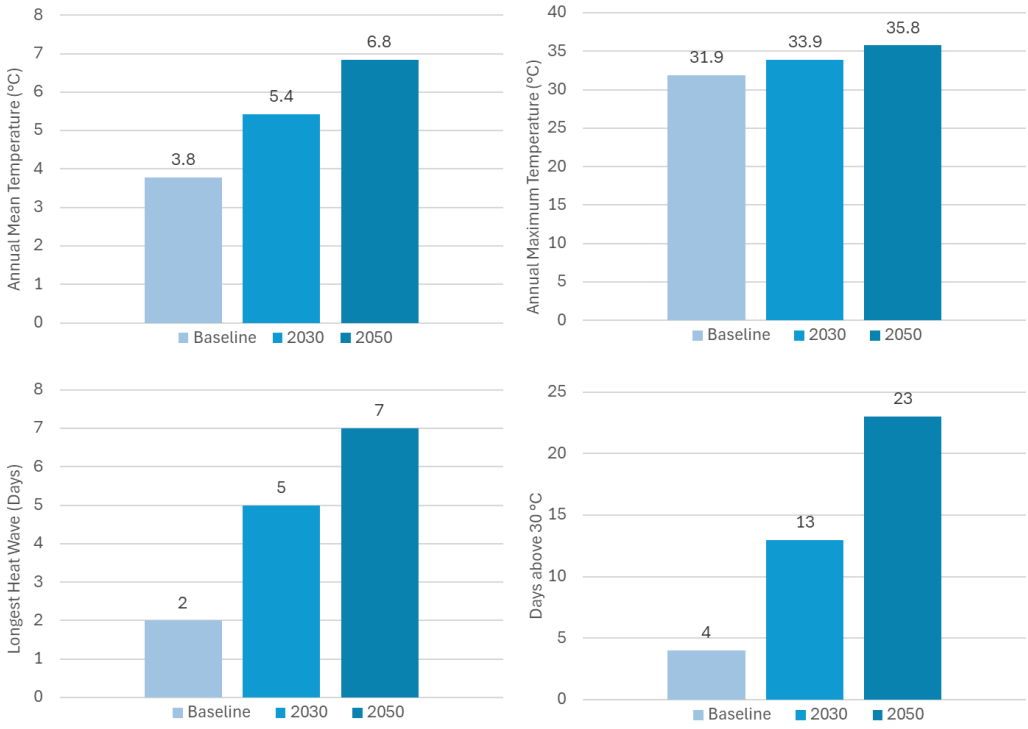

***Figure 4**. Annual Temperature Projections for the City of Edmonton under the SSP5-8.5 Scenario [12]*

Rainfall is projected to increase by roughly 7 % (23 mm) by the 2050s, while snowfall projections are expected to remain near current values (**Figure 5**). Seasonal snowfall statistics indicate that there will be an increase in snowfall during the winter months, but a decrease during the shoulder seasons (spring and autumn) as

more precipitation changes from snow to rain. The seasonal shift in snowfall may result in an earlier spring runoff and subsequent drier summer conditions. Given that temperature is projected to continue increasing at a steady rate, temperature increases and resulting evaporation are expected to outpace precipitation increases, leading to drier conditions [1], [10].

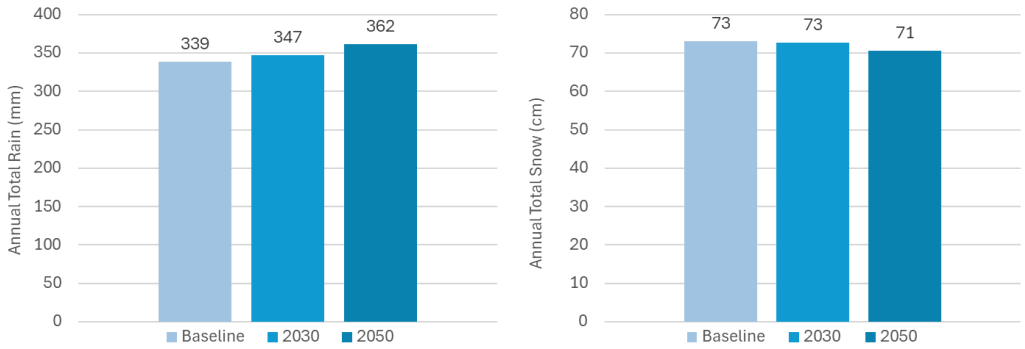

***Figure 5**. Annual Precipitation Projections for the City of Edmonton under the SSP5-8.5 Scenario [12]*

Annual drought statistics are presented as the number of days with precipitation below 1 mm (dry days) and the longest spell with precipitation below 1 mm (dry spell). Both the annual number of dry days and the longest dry spell are projected to remain relatively stable (**Figure 6**). While precipitation is projected to increase, the negligible change in the number of dry days and dry spell length indicates that precipitation is projected to be more frequent and more intense than historically. Higher intensity rain events will likely result in higher runoff, and potentially drier soil conditions as the top layer of soil quickly becomes saturated, causing the remaining precipitation to run off. Lower intensity rain allows the precipitation to seep further into the soil [1], [13].

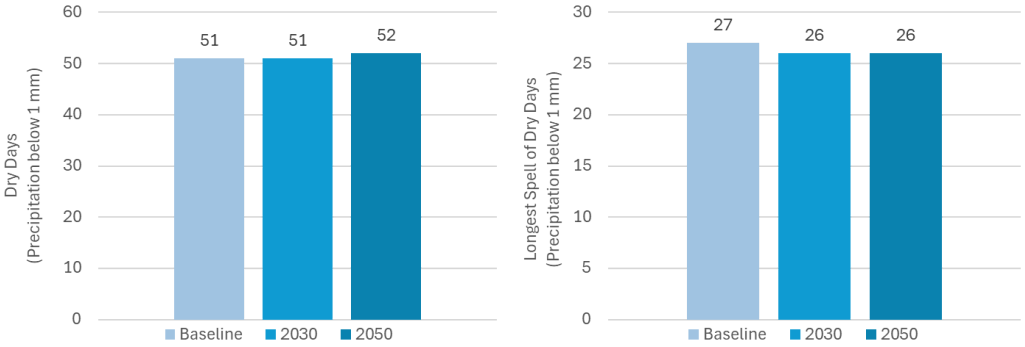

***Figure 6**. Annual Drought Projections for the City of Edmonton under the SSP5-8.5 Scenario [12]*

Canada's FWI System provides an indication of the likelihood of wildfires based on fuel moisture, temperature, relative humidity, wind speed, and rainfall. The FWI contains five Danger Classes that are summarized in **Table 5** [11].

***Table 5.** Fire Weather Danger Ratings*

Danger Class	FWI	Fire Danger
Low	0 – 4	Fires are likely to be self-extinguishing, and new ignitions are unlikely. Any existing fires are limited to smouldering in deep, dry layers.
Moderate	5 – 10	Creeping or gentle surface fires. Fires are easily contained by ground crews with pumps and hand tools.
High	11 – 18	Moderate to vigorous surface fires with intermittent crown involvement. Challenging for ground crews to handle; heavy equipment (e.g., bulldozers, tanker trucks, aircraft) is often required to contain fire.
Very High	19 – 29	High-intensity fires with partial to full crown involvement. Head fire conditions beyond the ability of ground crews; air attack with retardant required to effectively attack the fire's head.
Extreme	30+	Fast-spreading, high-intensity crown fires. Very difficult to control. Suppression actions are limited to flanks, with only indirect actions possible against the fire's head.

Fire Weather Indices are projected to increase into the future, as shown in **Figure 7**. The annual maximum FWI is projected to increase into the future. The maximum FWI is projected to continue to increase through to the end of the century, increasing from 15 (High) during the historical period to a projected maximum score of 19 (Very High) by the 2050s) time horizon. While the highest FWI typically occurs in the summer months, the autumn months are projected to have the largest increase in the maximum FWI. Overall, the fire season length is expected to increase by a median value of 16 days.

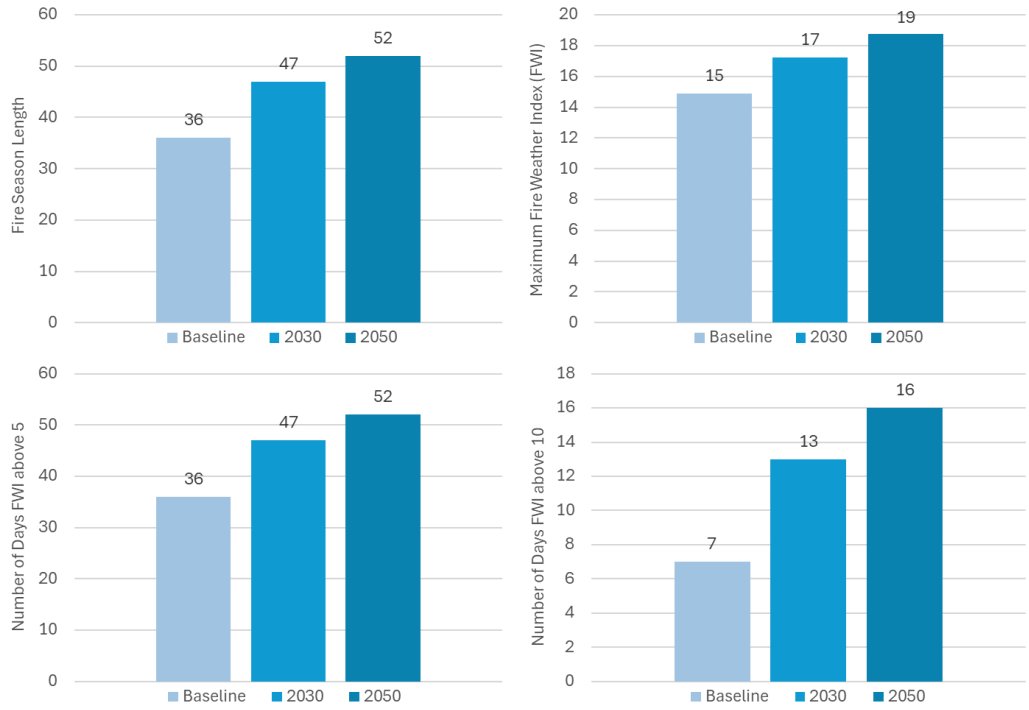

Figure 7. *Annual Fire Weather Projections for the City of Edmonton under the SSP5-8.5 Scenario [12]*

4.2.2 Summary of Projected Changes and Implications for Wildfire Exposure and Management

As temperatures rise, moisture evaporation from the soil and potential fuel sources are also projected to increase. This increased evaporation, combined with the earlier spring runoff and little change to summer rainfall, will result in an increased likelihood of fuel drying out and, therefore, an increase in the likelihood of wildland fires [10], [15]. Furthermore, with temperatures rising faster, temperatures towards the start and end of summer will increase, resulting in an increase in the length of the fire season.

Precipitation projections indicate that there will be an increase in total rainfall annually, while annual snowfall is projected to remain near historical levels (**Figure 5**). The increase in annual rainfall is the result of increased temperatures in the shoulder seasons (spring and autumn), where precipitation that historically fell as snow is projected to fall as rain. The seasonal shift in snowfall amount may result in an earlier spring runoff and subsequent drier summer conditions [1], [10], [15]. These increasingly dry conditions are a particular concern in Edmonton, as local wildfires have been common in the early spring before green up, when dry grasses and woody debris are prone to ignition.

In the long term, changes in fire regimes may influence forest composition. For example, frequent and intense fires can shift forests from conifer-dominated stands, such as black spruce, to more deciduous species like aspen and birch, which are generally less flammable [15].

Although wildfire risk increases gradually, decisions made and actions taken today will affect the safety and resilience of assets for years to come. Planning for wildfire

is not only about managing today's risks but about preparing for a future where extreme fire weather and longer fire seasons become the norm. Edmonton's changing climate is considered in the mitigation and adaptation actions in Section 5. By considering the long-term impacts of climate change, Edmonton can effectively transition to a wildfire-adapted community as conditions continue to evolve.

4.3 Modeling and Mapping Wildfire Exposure in Edmonton

Understanding local wildfire risk requires evaluating the potential for valued assets, like homes and infrastructure, to be affected by wildland fuels. This process considers various ignition mechanisms, including:

+ **Direct exposure:** affects structures in direct contact with fire (e.g., fuel within 0-3 m)
+ **Radiant heat:** affects structures within 30 m of any wildland fuels
+ **Short-range ember transport**: affects structures within 100 m of wildland fuels capable of producing short-range embers (e.g., deciduous and mixed forest stands)
+ **Long-range ember transport:** affects structures within 500 m of wildland fuels capable of producing long-range embers (e.g., coniferous forest stands)

Each of these hazards can independently or collectively threaten assets, depending on the local wildfire environment. The type of wildland fuel present, such as grasslands, shrubs, or dense forests, plays a significant role in determining fire spread characteristics, intensity, and ember generation potential.

To understand wildfire exposure in Edmonton, a simple but robust wildfire exposure model (fireexposuR [16]), developed with funding from the Canadian National Research Council (NRC) and endorsed by FireSmart, was used to map wildland fuels within the city and a 2-km buffer surrounding the city. The 2-km buffer was included to show the influence of wildfires approaching from outside the municipality. Data outside the city boundary is not shown in the exposure maps below but is used in the modeling process. Exposure scores were generated to estimate the potential for wildland fuels to impact structures via two of the four ignition processes outlined above.

Direct exposure to flame is difficult to accurately assess over large areas, as it is highly dependent on specific characteristics of the built environment at the property level. Therefore, direct exposure (i.e., flame contact) is not modelled. Additionally, exposure to long-range ember transport is not included in the modeling, given that Edmonton's WUI consists almost entirely of occluded wildland areas (patches of vegetation surrounded by urban development) and is dominated by deciduous trees, shrubs, and grasslands that generally do not burn with sufficient intensity to produce long-range embers. While small patches of coniferous forest have the potential to generate long-range embers, radiant heat and short-range embers are the most likely mechanisms for structure ignition and are the focus of the exposure modeling and mapping presented below. It is assumed that structures greater than

100 m away from wildland areas will have low exposure to ember ignition and structures within 30 m of wildland fires should be assessed individually for specific susceptibility to direct flame exposure. Future updates to the Strategy may wish to consider exposure to long-range embers after actions have been prioritized to address risk from radiant heat and short-range embers.

The fireexposuR model assesses wildfire exposure as a function of asset proximity to wildland fuel hazards and the fire behaviour associated with each fuel type. The model uses landcover data to categorize fuel as hazardous or non-hazardous for each ignition process analyzed (i.e., if the fuel type can cause ignition from radiant heat up to 30 m or short-range ember transport up to 100 m). Each ignition process is analyzed using a circular buffer zone to identify the exposure level of every point in the city to hazardous wildland fuels. The exercise is completed at a five-metre resolution, with the proportion of surrounding land within each buffer that contains combustible vegetation identifying the exposure rating. Exposure scores are then rated on a scale from low to extreme in alignment with the National Guide on Wildland Urban Interface Fires. See **Appendix A.3** for a more detailed explanation of the wildfire exposure modeling and mapping methodology.

The fireexposuR model uses only vegetation fuel type as an input for understanding the potential extent of fire exposure. The model does not include characteristics of topography (e.g., slope) and weather that modify the potential rate of spread, as these do not ultimately change the final potential extent of a fire [17], [18]. Given that Edmonton does not have a complex topography and fires are of greatest concern during periods of hot, dry, and windy weather, the vegetation-based exposure model provides a suitable and reliable estimate of the areas within Edmonton that could be impacted by wildfire under hazardous weather conditions. Topography is an important consideration for more detailed site-specific risk assessments as aspect can modify fuel loading, and slope angle can influence the fire spread rate by preheating upslope fuels.

Figure 8 and **9** show the results of the exposure modeling and mapping for the two considered ignition mechanisms (radiant heat and short-range ember transport). The radiant heat map (**Figure 8**) shows exposure levels for areas of the city with structures (i.e., buildings) within 30 metres of hazardous wildland fuels, while the short-range ember map (**Figure 9**) shows exposed areas with structures within 100 metres of hazardous fuels. It is important to note that the exposure model considers fuels as simply hazardous or non-hazardous to assess exposure level when, in reality, the specific character (species composition and structure) of different fuel patches will cause different risks for areas with the same exposure level. Further discussion on differentiating fuel hazards and related vegetation management is provided in **Section 5.1.1.1**.

4.4 Risk Factors and Values of Interest

While exposure is a key component of risk, it does not consider the vulnerability of assets or communities exposed to fire hazards. Vulnerabilities may include physical characteristics that influence the combustibility of a neighbourhood, such as the type of construction materials, landscaping, and structure density, or demographic characteristics that influence a neighbourhood's ability to respond to and recover

from a wildfire, including household income, age, or other population characteristics.

For this assessment, risk is assessed qualitatively by overlaying the wildfire exposure outputs onto select urban and demographic data layers. This qualitative assessment provides a visualization of vulnerability characteristics that, when combined with exposure, helps identify areas for further, more detailed risk assessment and informs general guidance on mitigation and adaptation strategies. The intention and benefit of this qualitative approach is to provide transparency about the vulnerability factors influencing wildfire risk without assigning a ranking of the importance of each vulnerability characteristic. To understand wildfire risk in detail, strategic site-level assessments will be necessary to validate fuel types and asset and/or neighbourhood-level vulnerabilities. These detailed assessments can be informed by and prioritized based on the vulnerability overlays provided below.

Figure 10 through **16** show vulnerability overlays for seven indicators of vulnerability in relation to the 100 m ember transport exposure layer. These indicators are derived primarily from 2021 census data and aggregated at the census dissemination area. These indicators include:

+ **Structure density:** This is an indicator of the vulnerability of a fire spreading through the built environment. Higher building density could support more fire spread and more extensive damage to built infrastructure. In Edmonton, WUI areas generally have lower structure density, as properties abutting wildland areas tend to have larger lot sizes than properties in higher-density urban parts of the city. The highest structure densities in the WUI are found in the central river valley in the Central, Scona, and Southeast planning districts and near smaller linear patches of naturalization throughout the city (**Figure 10**).

+ **Dwelling density:** This is an indicator of dwelling units (i.e., homes). The overlay shows where the greatest number of dwelling units exposed to wildfire are located. This tells a similar story to the structure density overlay but reflects a more human-centred approach to wildfire risk. The areas with the greatest number of dwellings exposed may not be the same areas with high structure density as areas with multi-family dwellings may have few structures exposed but represent many dwelling units. **Figure 11** highlights high dwelling density in the central river valley in the Central and Scona planning districts, where multi-family dwellings are common and lower dwelling density around most other parts of the river valley and ravine system, where single-family dwellings dominate. Moderate dwelling density is common around linear naturalized areas throughout the city.

+ **Median household income:** This is an indicator of social vulnerability. Lower-income neighbourhoods could be less prepared for wildfire and may have a harder time recovering if damage occurs. **Figure 12** indicates that WUI areas around the river valley and ravine system generally have higher household income while WUI areas near smaller parks and naturalized areas in other parts of the city tend to have lower incomes. The Southwest

portions of the North Saskatchewan River Valley and the Whitemud Creek Ravine show the highest income levels.

+ **Median property value:** This is an indicator of infrastructure costs and the potential financial impact of wildfire damage, should a wildfire occur. High property values could be associated with higher replacement costs and insured losses. It is important to note that this indicator is closely correlated with median household income but tells an inverse story. High-value properties may represent larger financial risks related to wildfire, but this does not represent the social cost of damage, which may be much higher in areas with lower property values, where residents may be less able to respond and rebuild. **Figure 13** shows a similar trend to **Figure 12**, with the highest value properties located in the southwest portion of the city near the river valley and Whitemud Creek Ravine.

+ **Median age:** This is an indicator of social vulnerability. Results from the public engagement process indicate that younger residents are less aware of wildfire risks and generally less prepared for an emergency when compared to older residents. However, seniors may have mobility challenges, increasing risks during an evacuation. **Figure 14** shows limited trends in age distribution across WUI areas with the only notable deviation being in some areas around Whitemud Creek Ravine showing a higher median age.

+ **Population racialization:** This is an indicator of social vulnerability. Neighbourhoods with a higher proportion of racialized populations may have different communication needs to understand wildfire risk and may also have fewer resources to prepare for and recover from wildfires. The census data provides two indicators to represent population racialization:

    - **Percent of population identified as Indigenous (Figure 15):** The percentage of the Indigenous population is generally low throughout the WUI, with the highest percentages noted in the Southeast planning district near the river valley. In addition to being a focus group for potential social vulnerabilities, Indigenous partners will be a key interest group for the implementation of actions related to land stewardship.
    - **Percent of population identified as a visible minority (Figure 16):** The census data indicate that the visible minority population is low in the inner city and around the river valley, with higher percentages towards the outer city, where patches of WUI tend to be smaller and more isolated.

It is important to note that vulnerability indicators derived from census data represent only occupied dwellings (i.e., residential neighbourhoods) and do not show data for industrial and commercial areas. Risks to industrial, institutional, and commercial properties will depend on the structural characteristics of these properties, and the social, environmental, and economic consequences should the properties be impacted by wildfire. These sites should be assessed further through more detailed site-specific risk assessments.

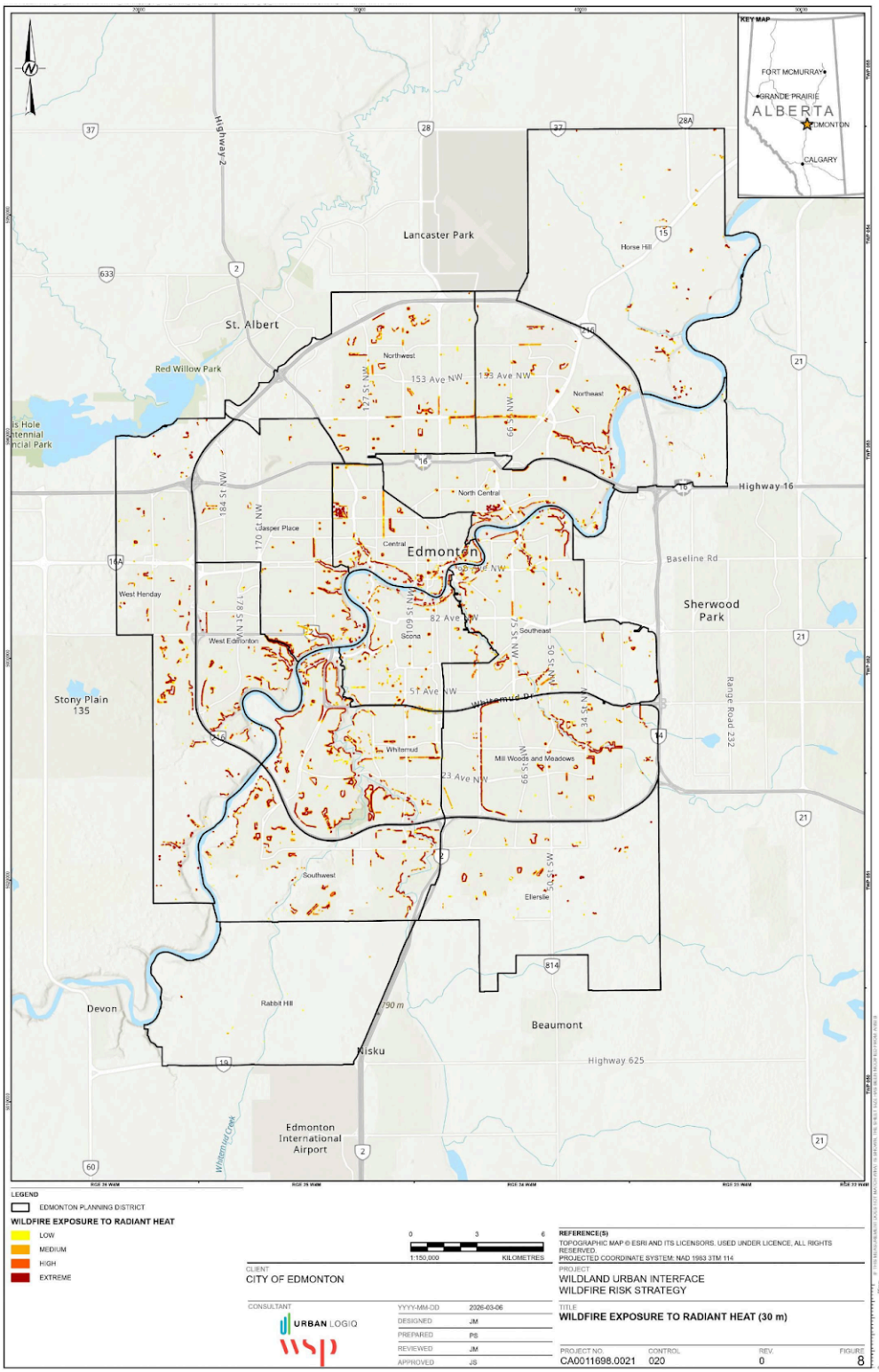

***Figure 8**. Wildfire Exposure to Radiant Heat (30 m)*

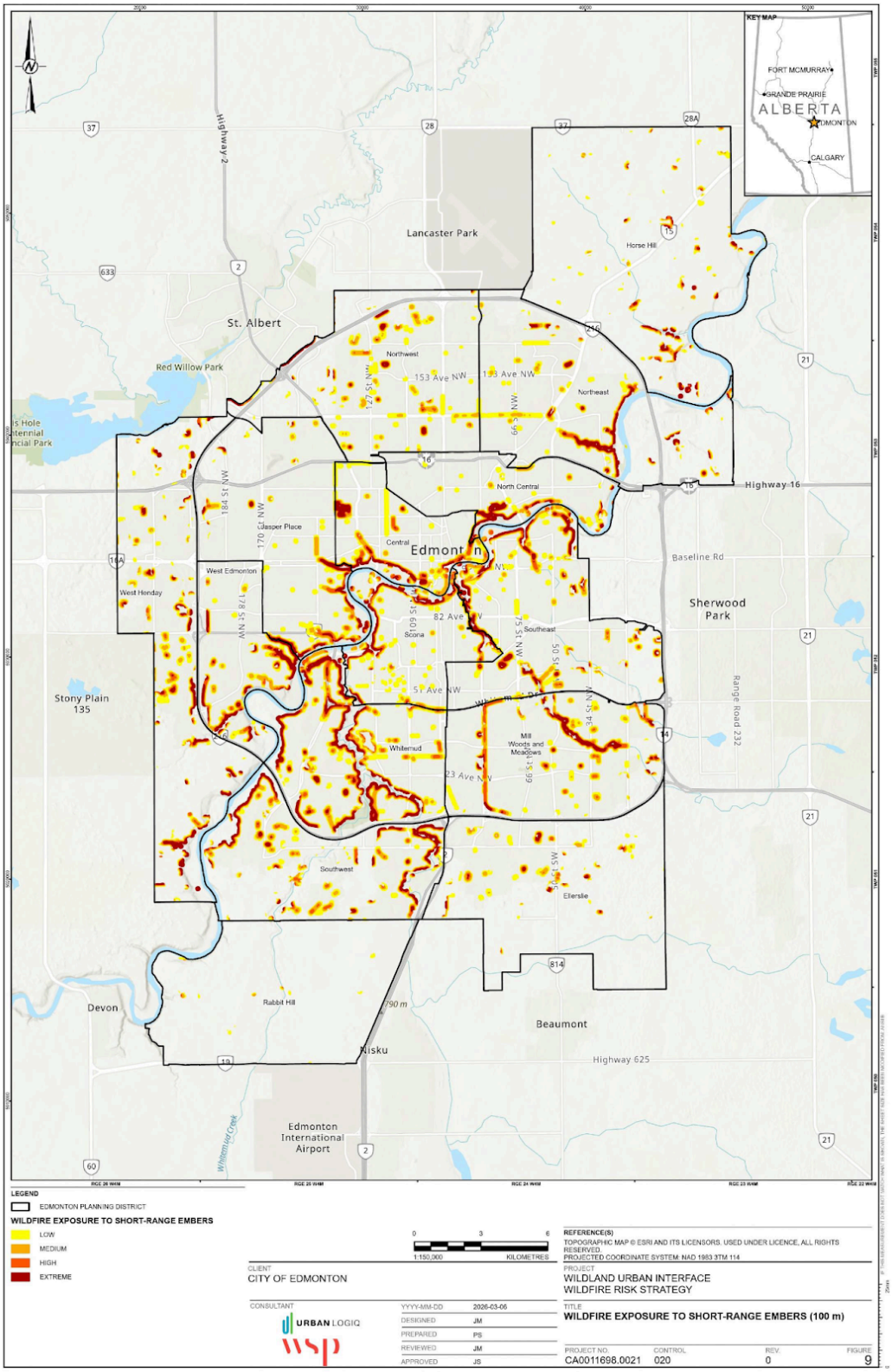

***Figure 9**. Wildfire Exposure to Short-Range Embers (100 m)*

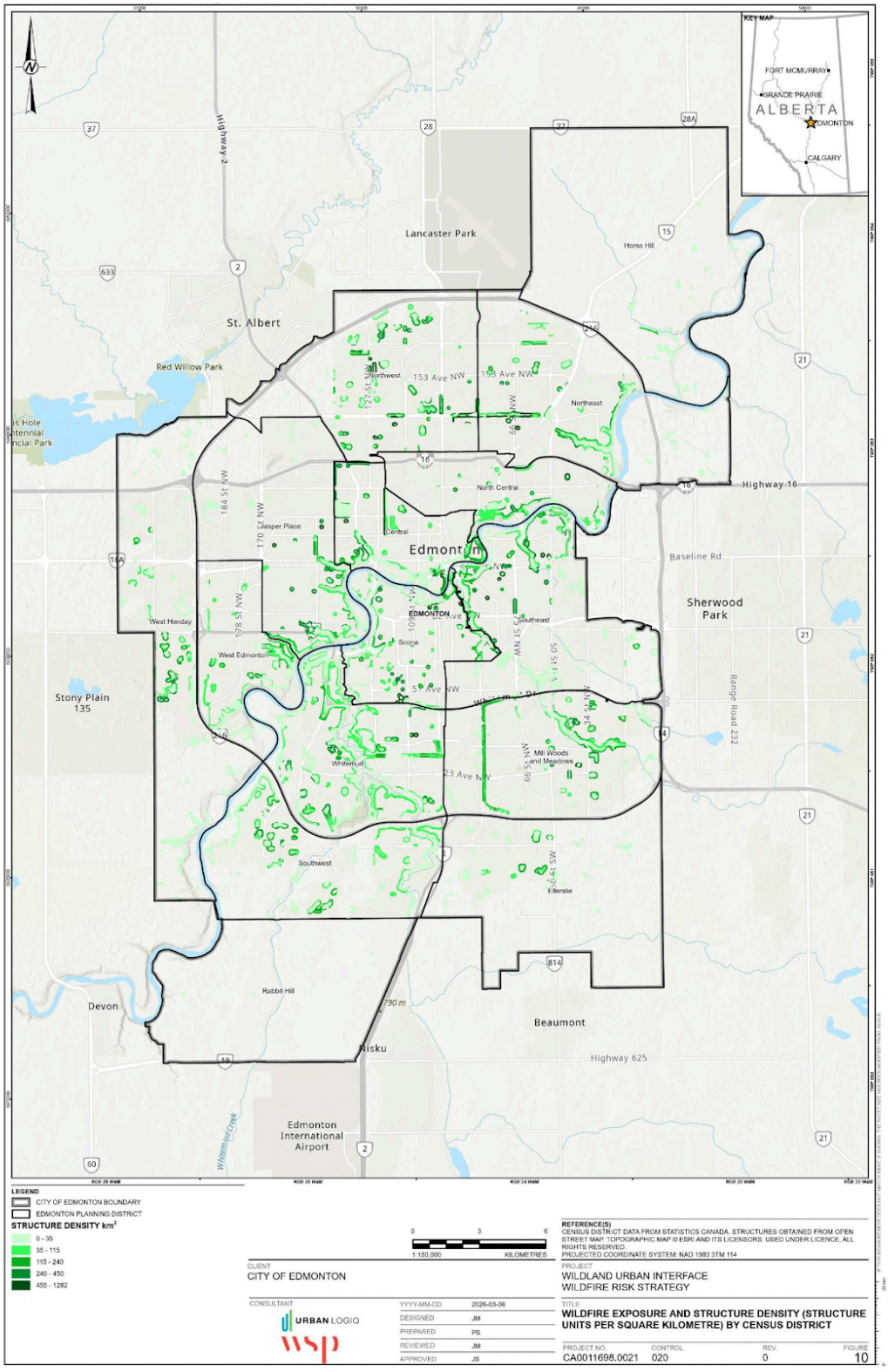

***Figure 10**. Structure Density (Structure Units per Square Kilometre) by Census District within the WUI*

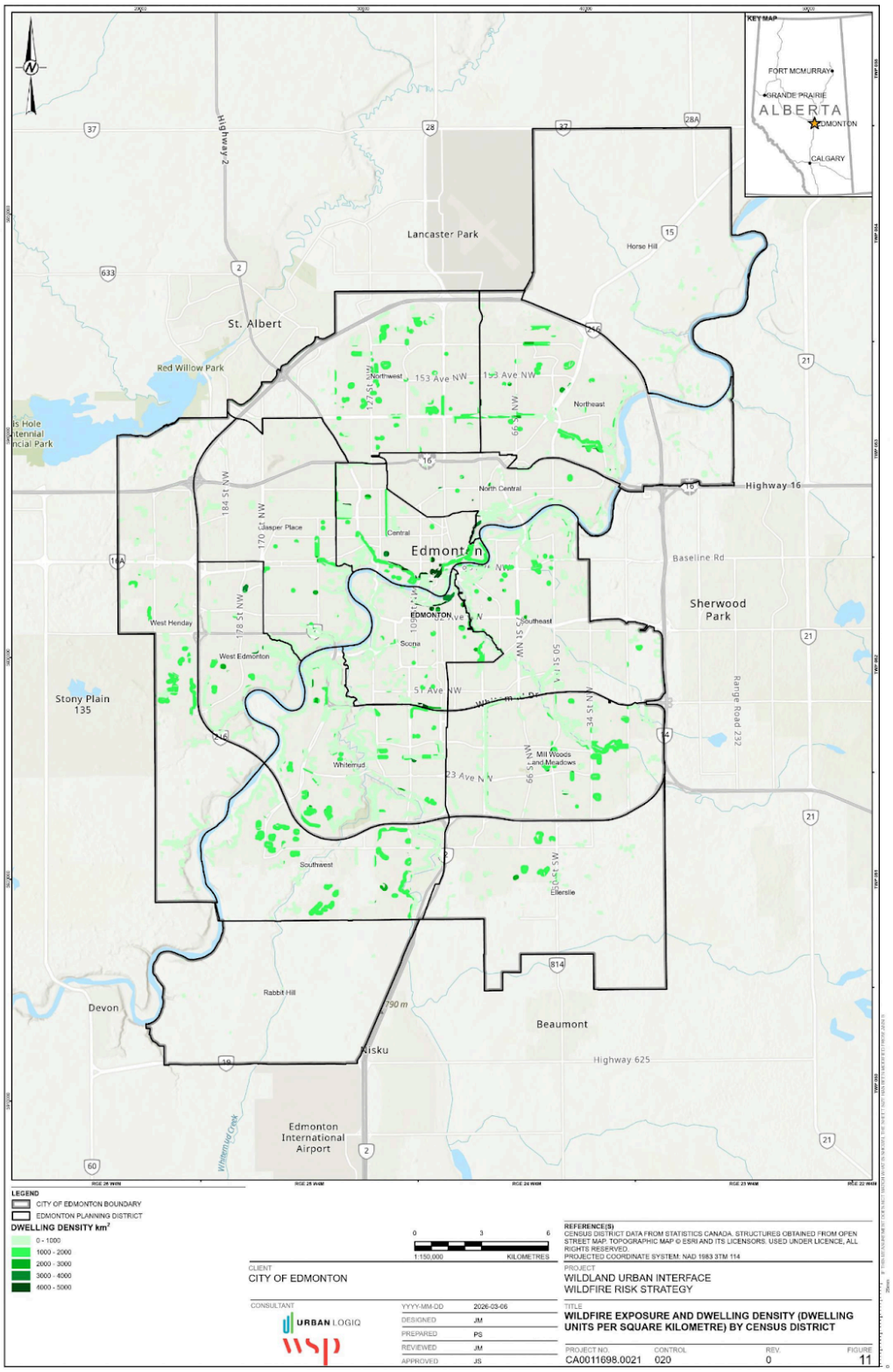

***Figure 11**. Dwelling Density (Dwelling Units per Square Kilometre) by Census District within the WUI*

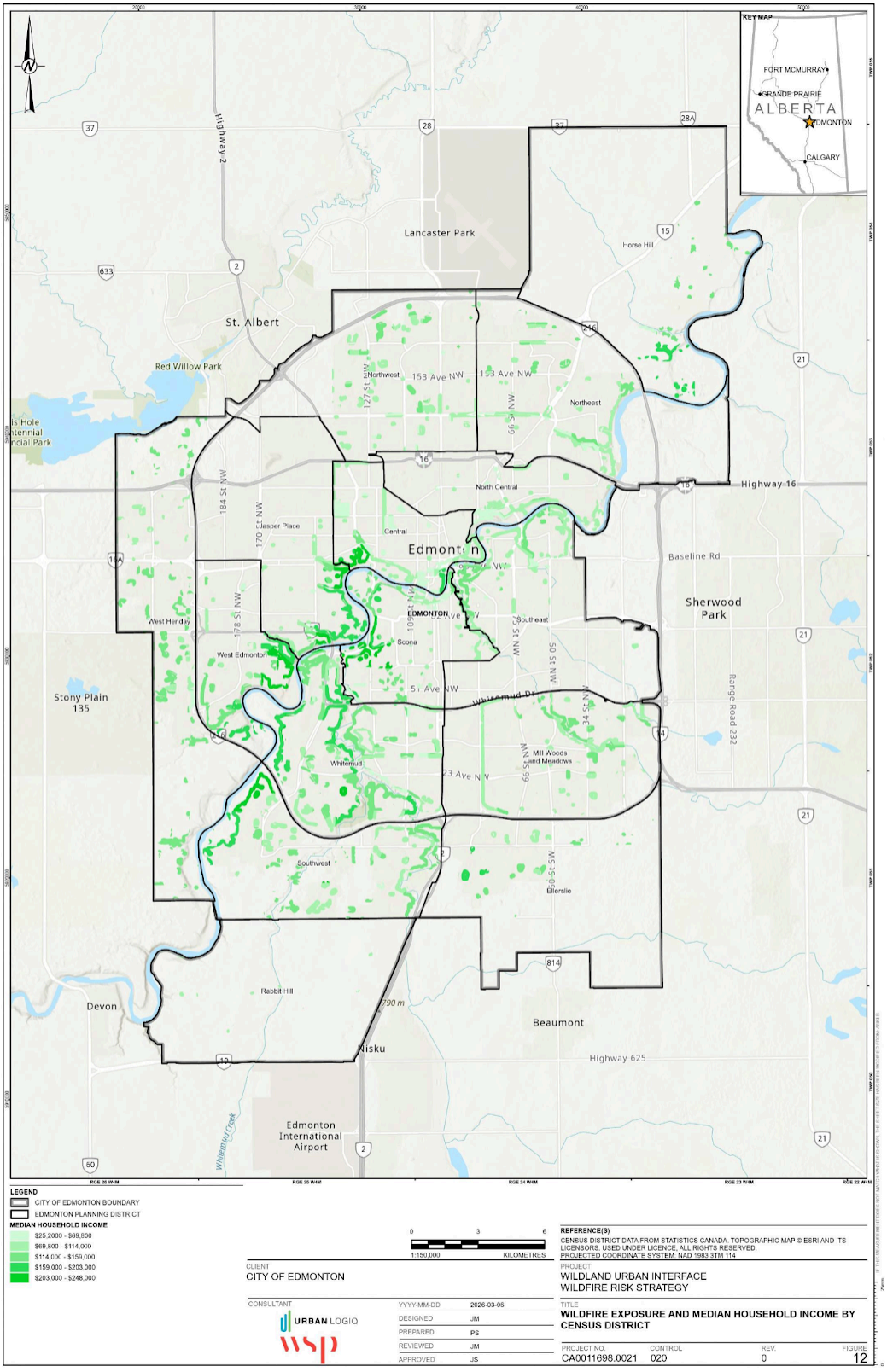

Figure 12. *Median Household Income ($CAD) by Census District within the WUI*

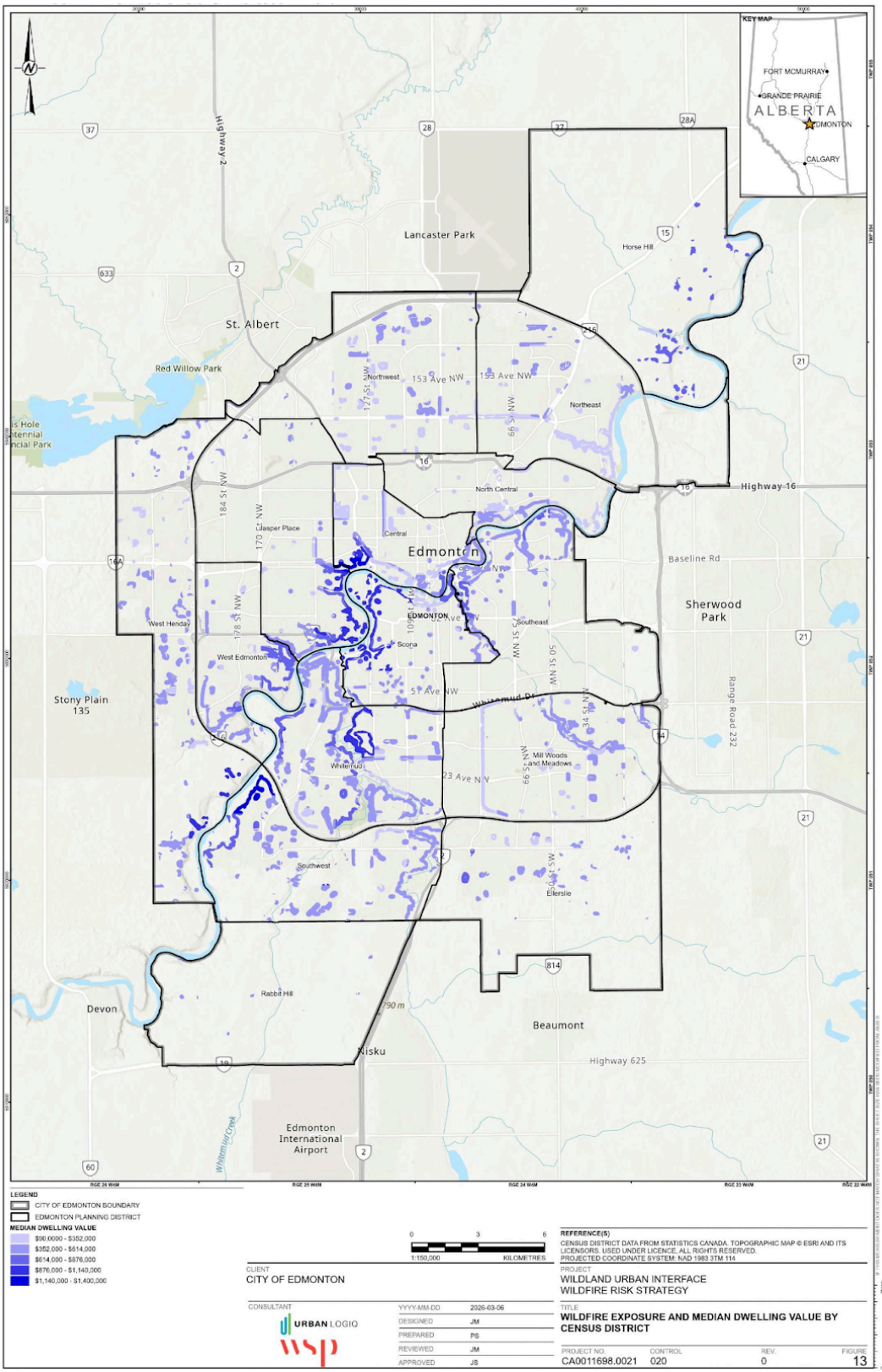

Figure 13. *Median Dwelling Value ($CAD) by Census District within the WUI*

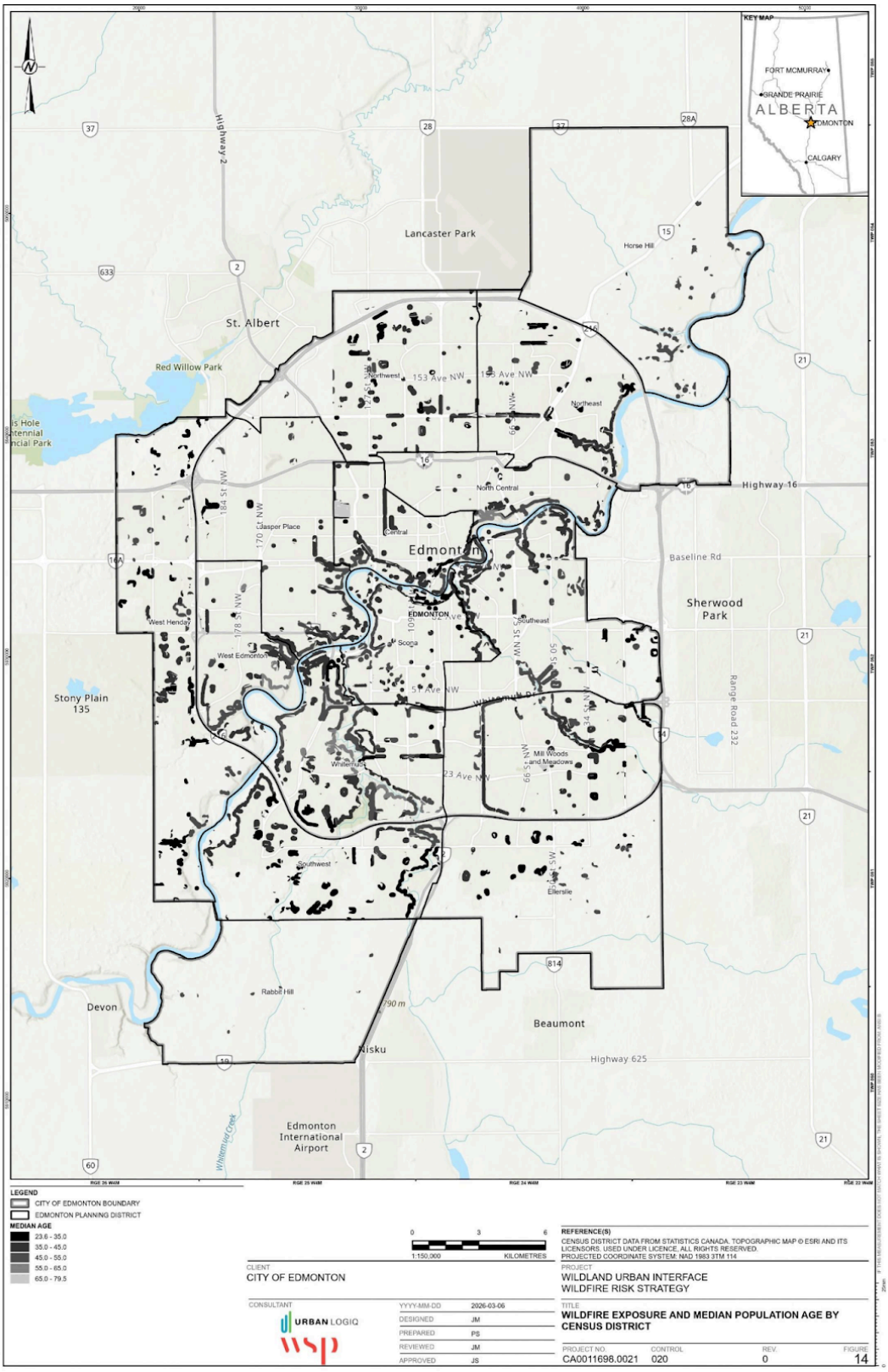

***Figure 14**. Median Population Age by Census District within the WUI*

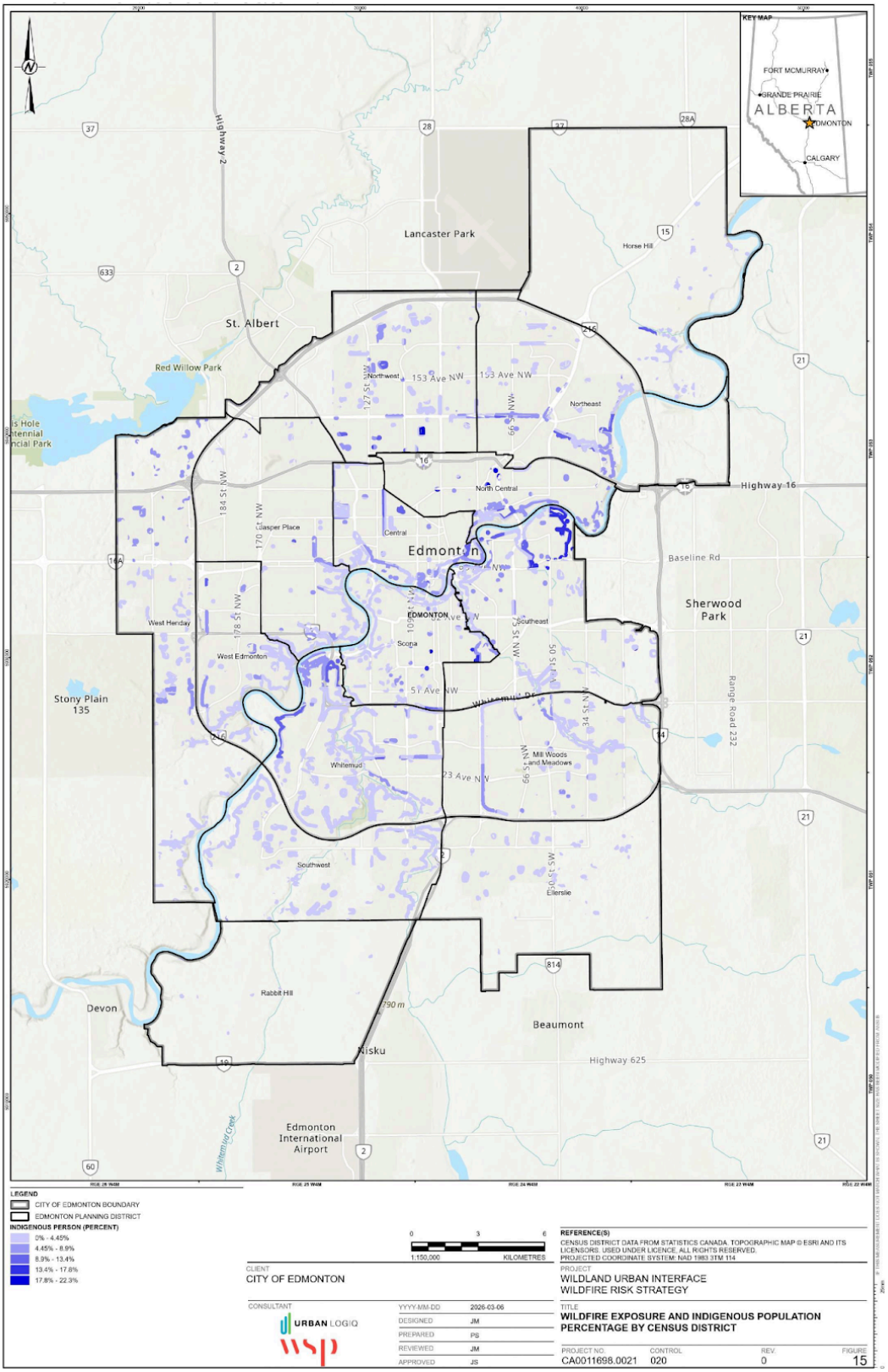

***Figure 15**. Indigenous Population Percentage by Census District within the WUI*

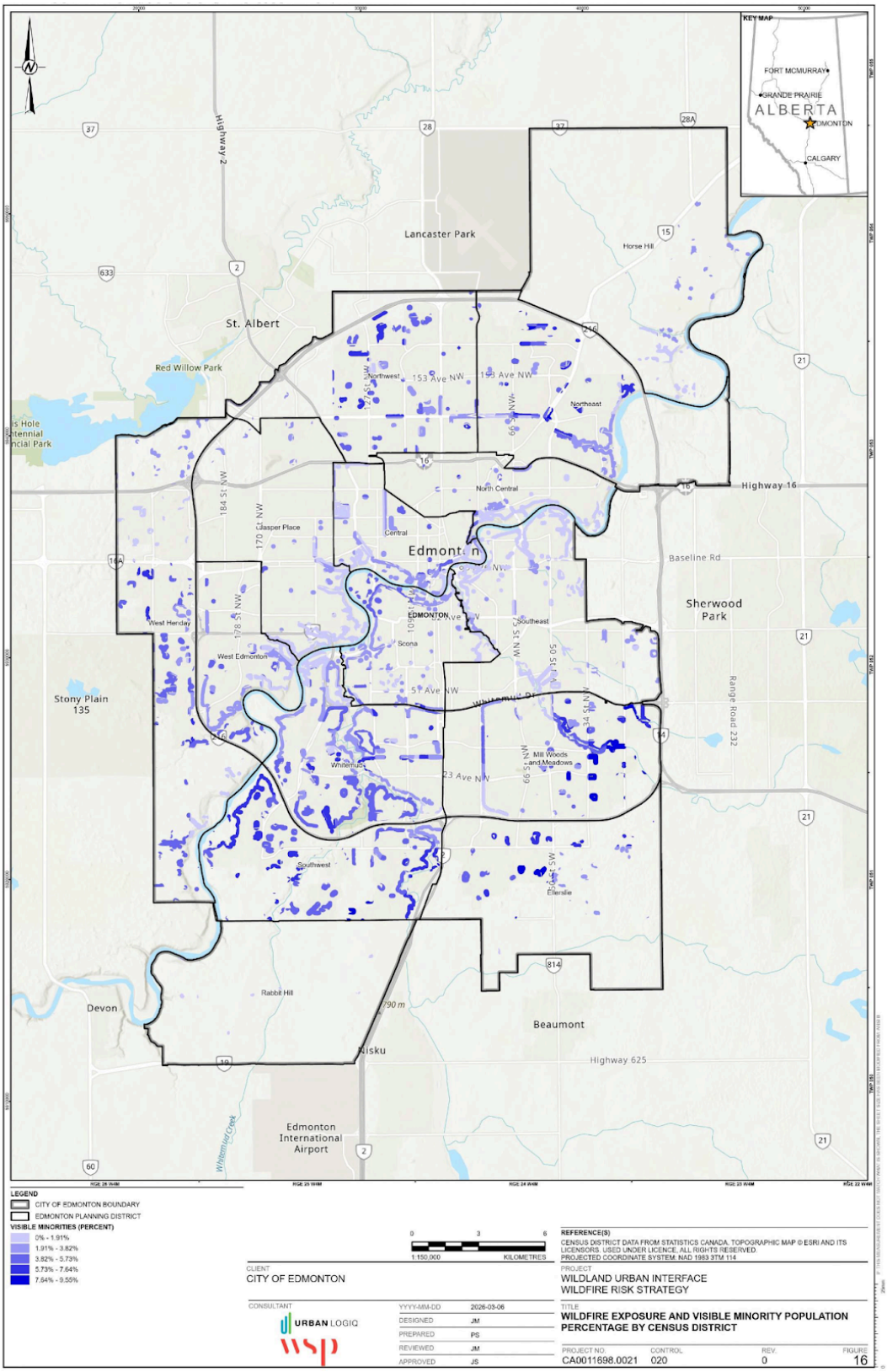

***Figure 16**. Minority Population Percentage by Census District within the WUI*

In alignment with the provincial FireSmart Guidebook for Community Protection, the City of Edmonton categorizes "values-at-risk" to support a standardized and rigorous approach to wildfire mitigation [19]. This provincial framework recognizes that community resilience depends on both private residential properties and the essential public infrastructure that supports them. By adopting this methodology, the City can enable all assets to be assessed through a consistent, evidence-based lens. To provide residents with localized precision, high-resolution maps are provided in **Appendix C**, with **Figure 17** illustrating the distribution of these values across the municipality and detailing the volume of structures within the Wildland-Urban Interface (WUI) and their relative exposure levels. Analysis results currently show the Whitemud, Northwest, and Southeast districts represent the highest density of total exposed structures. Note that very few structures are exposed to wildfire hazard in the Horse Hill district (11 total), making it difficult to visualize relative to other districts.

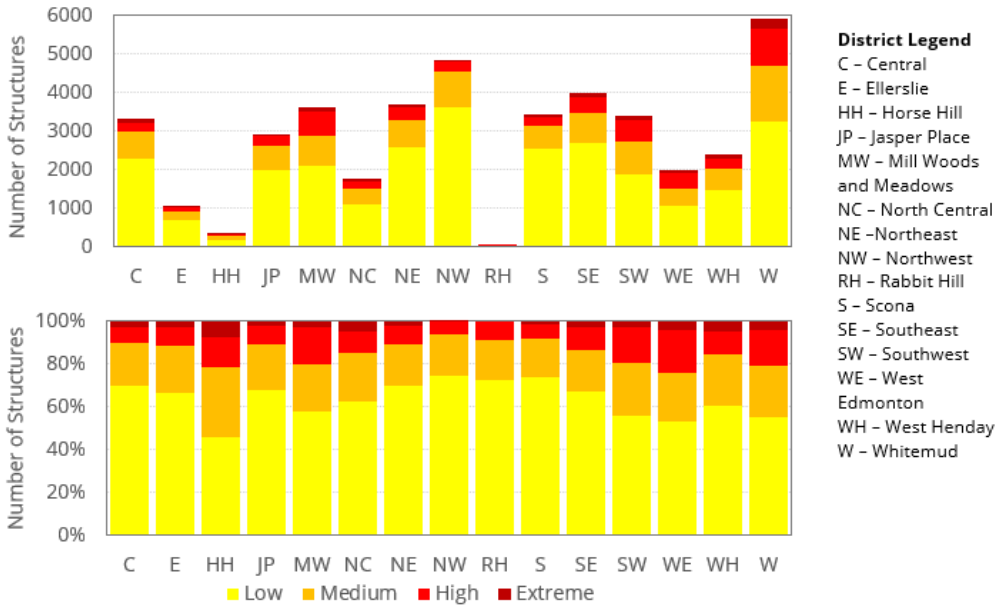

***Figure 17**. Structure Exposure by Planning District*

Critical infrastructure values-at-risk:

While the majority of exposed structures are residential dwellings and outbuildings, the FireSmart Guidebook identifies specific asset groupings that are vital to broader community well-being and recovery. As shown in **Figure 18**, critical infrastructure (including emergency services, power lines, and healthcare facilities) is prioritized for protection to prevent cascading community consequences during a wildfire event. The Southeast and Central districts contain the highest volume of exposed critical infrastructure, with elevated risk profiles noted in Whitemud, Scona, and Mill Woods and Meadows.

Additionally, the Southwest and West Henday districts have the highest exposure to power line infrastructure, requiring specialized mitigation strategies to maintain regional utility stability.

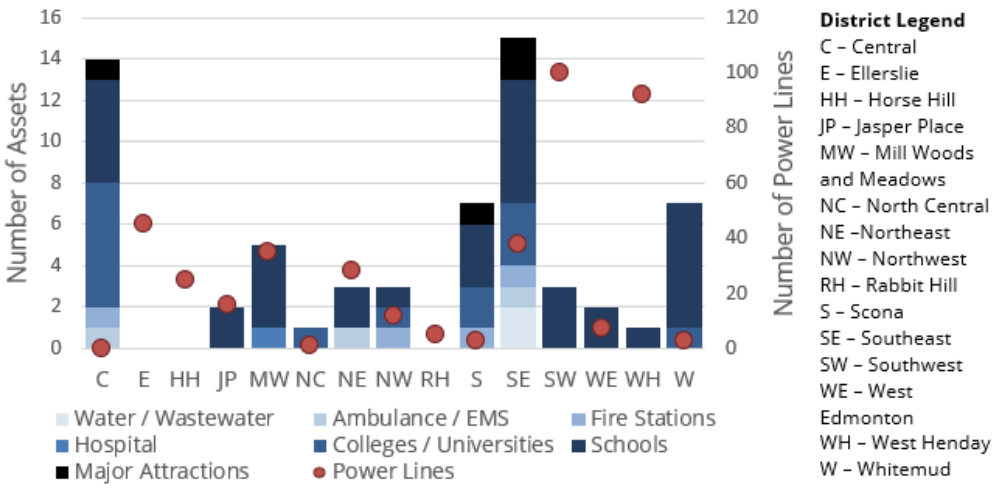

***Figure 18**. Critical Infrastructure Values-at-Risk By Planning District*

Hazardous values-at-risk:

A critical component of the FireSmart framework is the identification of hazardous infrastructure that could escalate wildfire intensity, impede first-responder safety, or result in environmental degradation. As illustrated in **Figure 19**, the exposure of hazardous values-at-risk remains relatively limited within the municipal boundary. Gas stations represent the most frequent hazardous asset identified within the 100-metre exposure zone. Not that most gas stations are exposed only to short-range (100 m) ember transport from small isolated patches of grassland or naturalized vegetation near major roadways. Specific instances of localized industrial risk are isolated to Edmonton's Waste Management Centre in the Northeast district. Note that other privately owned industrial facilities may also present a risk from exposed hazardous material, but have not been included in the City's values- at-risk data at this time.

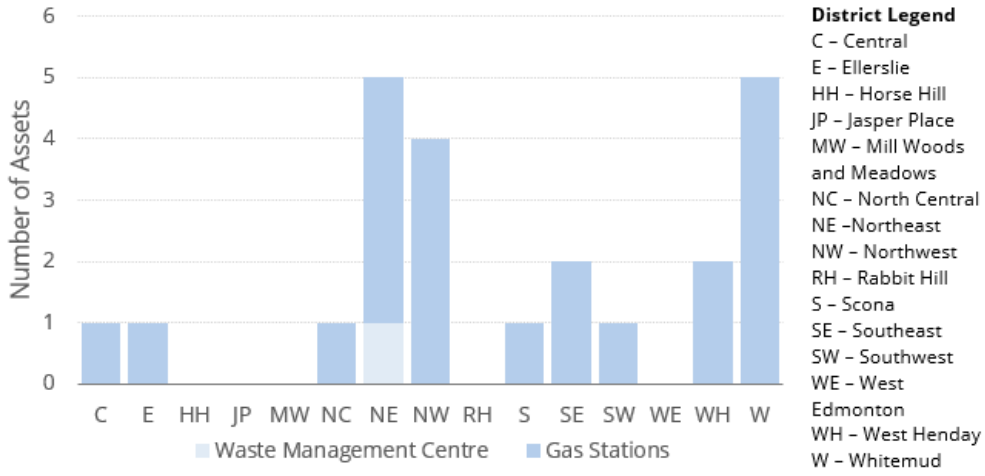

***Figure 19**: Hazardous Values-at-Risk by Planning District*

Special values-at-risk:

Figure 20 details "special values-at-risk," which encompass cultural and spiritual assets in Edmonton. These assets (e.g., cemeteries, churches, museums, galleries, and community centres) are essential to the heritage and historical identity of the city. The Central planning district contains the highest density and diversity of special values-at-risk, followed closely by the Scona district.

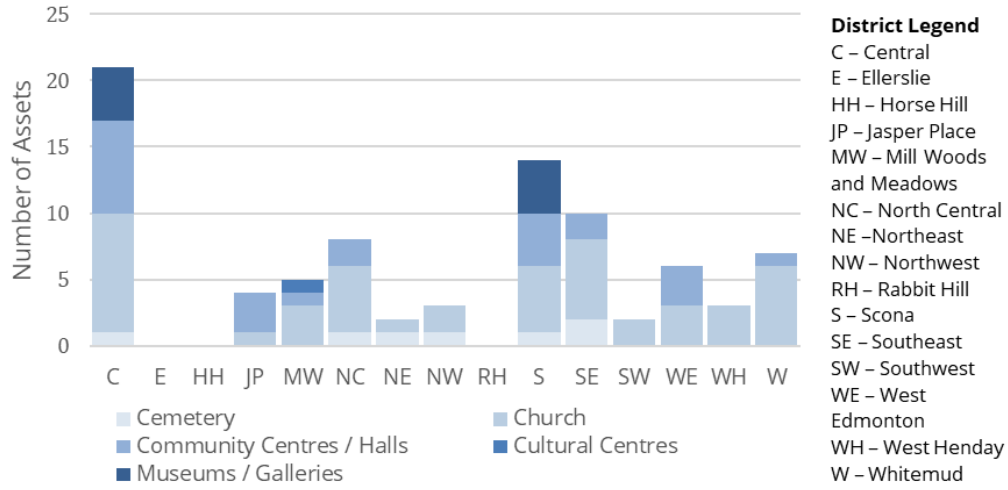

Figure 20: *Special Values-at-Risk Exposure by Planning District*

Standard values-at-risk:

The "standard values-at-risk" category, presented in **Figure 21**, represents the broadest classification of the built environment, including residential, commercial, and recreational assets that form the foundation of Edmonton's neighborhoods and local economy. The Northwest planning district demonstrates the highest concentration of standard values, followed by the Central district.

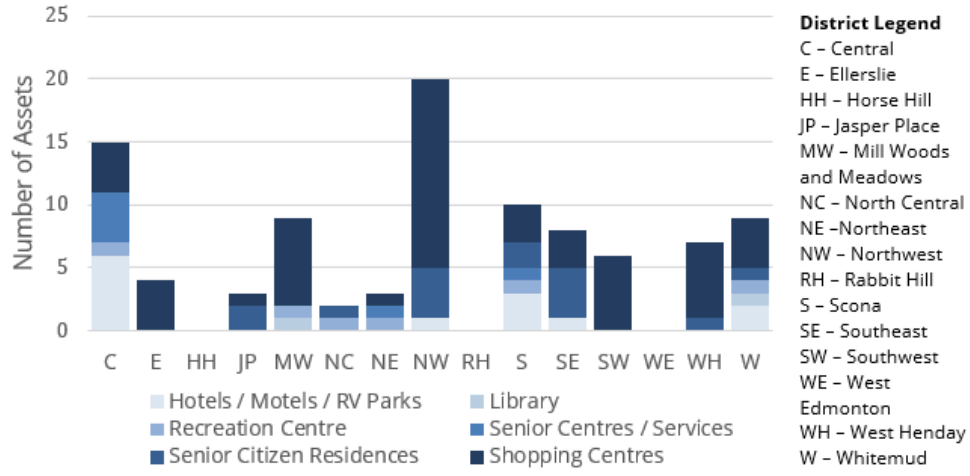

Figure 21*: Standard Values-at-Risk by Planning District*

5. WUI Wildfire Risk Mitigation and Adaptation

This section presents strategic mitigation and adaptation actions to reduce wildfire risk within Edmonton's WUI. These actions strengthen the city's resilience to wildfire by proactively addressing emerging and evolving risks associated with urban growth, climate change, and wildfire conditions. Actions are grouped by related FireSmart disciplines in alignment with the four strategic pillars of the Strategy established in **Section 1**.

The following sections present an overview of the goals and theory of FireSmart disciplines as they relate to the strategic pillars of the Strategy. Actions have been developed by subject matter experts (SMEs) in wildfire, emergency response, vegetation management, and urban planning and regulation for wildfire risk management. The actions are tailored to Edmonton's specific WUI context, build off past and current initiatives to manage wildfire risk, consider priorities identified through public engagement, and align with practices used successfully by other jurisdictions identified through the jurisdictional scan and guidance from FireSmart Alberta.

Each strategic pillar contains one or more specific action plans related to the FireSmart disciplines that contribute to the section's overarching goal. Actions include the scale at which the action is applicable, related FireSmart disciplines, the timeline in which the action will be implemented, and a generalized rating on the cost and impact of the action. Actions have been ordered to prioritize high-impact, low-cost actions and strategic initiatives (listed first) to support the City in implementing the most strategic actions first. Descriptions of the rating criteria used to estimate the high-level cost and impact of each action are provided in **Table 6**. Cost ratings reflect the City's initial implementation investment. Further downstream costs related to affected infrastructure would be evaluated as work progresses and specific design requirements are identified.

To provide accountability and transparency, annual reporting will track progress on the WUI Wildfire Risk Strategy. This reporting will summarize key milestones and utilize Key Performance Indicators (KPIs) to measure the impact of mitigation and adaptation actions, with findings publicly published.

The Strategy's action plans serve as the foundation for wildfire resilience. Through wildfire exposure and risk modelling outputs, actions were further prioritized based on cost, impact, and scale. This data-driven approach enables the customization of risk mitigation efforts and adaptation to evolving needs and priorities over future budget cycles. Finally, a list of potential funding sources is provided for the Strategy's implementation. These funding sources represent available options at the time this report was written and are likely to change over time with shifting priorities and new program development in the government and in the private sector.

Table 6. *Relative Cost and Impact Ratings and Descriptions for Action Evaluation*

Rating	Cost Rating Description	Impact Rating Description
Low	Cost can be absorbed within existing budgets with minor reallocation of funds.	Action will result in a limited reduction in wildfire risk across the WUI, with only the most motivated and engaged residents benefiting.
Medium	Costs require additional external funding (e.g., grants) or significant reallocation of existing budgets.	Action will result in notable improvements in wildfire resilience across the WUI. Outcomes will be measurable and apply to multiple properties within WUI neighbourhoods.
High	Costs require large or sustained external funding (e.g., grants), new revenue streams, or tax increases to support costs.	Action will result in widespread improvement in wildfire resilience at the WUI and community scale. Outcomes will be clearly measurable and widely adopted by residents in the WUI.

The action plans are the foundation of Edmonton's WUI Wildfire Risk Strategy. To effectively execute the Strategy, actions are assessed in conjunction with the wildfire exposure and risk maps to prioritize areas for further detailed risk assessment and resilience interventions with consideration for cost, impact, and implementation scale. This process enables Edmonton to customize wildfire risk mitigation efforts and adapt over time as needs, priorities, and opportunities evolve.

5.1 Action Plans by Strategic Pillar

5.1.1 Reduce: Minimize the Potential for Wildfire Ignition and Spread

This type of action focuses on reducing the potential for wildfire ignition and spread in and around Edmonton's WUI through vegetation management, planning, and regulation. Reducing the potential for wildfire ignition and spread requires practical, on-the-ground actions and initiatives to reduce vegetation fuel hazards and improve the resilience of homes, properties, and critical infrastructure. This includes initiatives led by the City to manage wildland fuels on public lands and improve neighbourhood resilience through land use and development processes. Residents also play a role in managing fire risk through site landscaping and home hardening (see **Box 2** for more information on fire-resilient homes). This level of approach is critical to protecting life safety and the natural and built environments by limiting the spread of fire from wildland areas to the built environment and vice versa. Risk mitigation efforts in the WUI are rooted in the FireSmart disciplines of Vegetation management, legislation, and development.

Box 2: Building Resilience to Wildfire at Home

Property owners play a role in managing fire risk through their actions, including maintaining defensible space landscaping and home hardening. These actions reduce the likelihood of wildfires reaching structures and ember igniting spot fires on properties.

Defensible space landscaping means ensuring combustible materials and flammable vegetation are not within 1.5 m of buildings and ensuring coniferous vegetation is appropriately spaced from other coniferous vegetation, structures, and property lines. Critical steps to maintaining effective defensible space include:

+ Preventing the accumulation of debris in yards and on or under structures.
+ Avoiding planting flammable vegetation (e.g., coniferous trees and shrubs) close to structures.
+ Maintaining well-hydrated, trimmed vegetation with generous spacing between trees.

Home hardening means replacing combustible building materials on structures, such as homes, with fire-resistant or non-combustible options and taking actions to prevent embers from entering vulnerable areas like vents.

Learn More and Access Resources at FireSmart Alberta.

5.1.1.1 Vegetation Management

Wildfire is a foundational ecological component of Alberta's parkland ecosystems. However, historical fire suppression has resulted in a significant accumulation of dry and/or dead vegetation that can ignite and burn in a wildland fire, often referred to as fuel. This fuel buildup represents an escalating risk to the WUI unless mitigated. Vegetation management serves as a primary intervention to reduce wildfire intensity and create defensible space. By assessing and modifying fuels in an ecologically sensitive way, the City will establish fuel-reduced buffers to minimize the potential spread of wildfire to developed areas. These buffers are essential for disrupting the path of a wildland fire and reducing the potential for radiant heat or flame contact to impact structures. While these vegetation management initiatives significantly decrease the threat level to Edmonton's neighbourhoods, they are integrated into a broader resilience framework. While fuel modification can reduce hazard intensity, it is one component of a comprehensive strategy that includes additional measures, such as home hardening and public education, to maximize community safety. This section provides a general Vegetation Management Plan for the whole city, with a focus on identified Vegetation Management Priority Areas, based on the results of the wildfire exposure modeling.

Vegetation Management Methods

Broadly, there are three methods of implementing vegetation management: fuel removal, fuel reduction, and fuel conversion. Each of these forms the basis of recommendations for vegetation management focused on the land cover types within Edmonton.

- **Fuel Removal:** the clearing of all combustible vegetation along a linear area to create a fuel break. This method is often used when there is a threat of large wildfires entering a community from adjacent forested or grassland areas.
- **Fuel Reduction:** the selective removal of hazardous vegetation to reduce the intensity and rate of spread of a potential wildfire. Fuel reduction types include:
    - **Ladder Fuel Reduction:** pruning all lower limbs on coniferous trees to a height of 2 meters.
    - **Coniferous Stand Thinning:** selectively removing coniferous trees to reduce stand density.
    - **Surface Fuel Reduction:** removing dead and downed woody debris. This method is primarily focused on fine and medium fuels but can include heavy fuels if there is an excess.
    - **Prescribed Burning:** removing fine and medium fuels by use of controlled fires.
- **Fuel Conversion:** the conversion of hazardous vegetation, such as spruce and pine, to more fire-resistant species, such as aspen and birch. Fuel conversion will be the primary method that allows for mitigating future risk from climate change, but requires extensive review and planning to balance ecosystem function and conservation priorities in mature, healthy forests.

Vegetation management initiatives are strategically aligned with the City's Land Management Classifications (LMCs) to support a balance between ecological integrity and wildfire resilience. This framework enables fuel reduction methods to be tailored to the environmental and recreational sensitivity of specific landscapes. To support this evidence-based planning, the Urban Primary Land and Vegetation Inventory (uPLVI) dataset is utilized to categorize natural land cover, facilitating high-resolution wildfire exposure modeling and tactical resource allocation.

In Preservation Areas, the primary objective is to protect sensitive ecosystems and maintain natural functioning. To safeguard biodiversity, standard fuel removal will be avoided where possible in these areas. Where mitigation is essential for community safety, priority will be given to ecological emulation through natural processes, such as targeted grazing or prescribed burning, to replicate natural disturbance patterns. While fuel conversion is generally restricted to maintain environmental integrity, a flexible, risk-based approach is maintained: if a preservation area poses an unavoidable threat to a high-value asset, intensive

vegetation management may be considered in that location and will follow existing ecological assessment and approval processes.

Conservation Areas connect residents with the river valley and ravine systems while minimizing environmental footprints. In these landscapes, wildfire safety will be integrated with regional connectivity, with fuel removal utilized only in the highest-risk wildfire areas. Mitigation efforts will focus on high-traffic trail systems where ignition risks are elevated. Furthermore, as part of long-term climate resilience, the planting of fire-resistant species will be prioritized where possible, ensuring that ecological integrity and function are maintained to support biodiversity. Existing vegetation will be systematically converted to more resilient types in alignment with budget and urban forest management cycles.

In Active and Working Landscapes, which facilitate gathering and recreation, a comprehensive suite of vegetation management approaches will be taken. Mitigation efforts will be concentrated in high-use areas, including picnic areas, event spaces, and primary trail corridors, to reduce ignition risks associated with human activity. Throughout these areas, the City emphasizes the importance of planting the right vegetation in the right place to support public enjoyment, increase wildfire safety, and support biodiversity as shared outcomes.

For vegetation management planning, the natural land cover types outlined in the City's Urban Primary Land and Vegetation Inventory (uPLVI) dataset, which informed the wildfire exposure model, have been grouped into broader land cover types with assigned fire hazard ratings (**Table 7**).

***Table 7**. uPLVI Site Types/Forested Stand Type Groupings*

General Land Cover Type	uPLVI Site Types/Forested Stand Type	Fire Hazard Rating
Coniferous and Coniferous-Leading Mixedwood	Coniferous Leading Mixedwood (CLM)	Extreme
	White Spruce (SW)	Extreme
	Black Spruce (SB)	Extreme
Deciduous and Deciduous-Leading Mixedwood	Trembling Aspen (AW)	Moderate
	Balsam Poplar (PB)	Moderate
	Manitoba Maple (MM)	Moderate
	Mixed Deciduous (MD)	Moderate
	Deciduous Leading Mixedwood (DLM)	Moderate
Grassland and Shrubland	Recent Clearing (CL)	NA
	Tame Pasture (CP)	Moderate
	Rough Pasture (CRP)	Moderate
	Closed Shrub (CS)	High

	Herbaceous Grass (HG)	High
	Medial Shrub (MS)	High
	Non-Maintained Grass/Shrub (NG)	High
	Open Shrub (OS)	High
Wetland	Grass Fen (GF)	Low
	Marsh (M)	Low
	Shrub Fen (SF)	Low
	Swamp (SW)	Low
	Treed Fen (TF)	Low
	Shrub Bog (WS)	Moderate
	Treed Bog (WT)	Moderate

These groupings streamline vegetation management recommendations for similar land cover types. Land management types, Preservation, Conservation, and Active/Working Areas, have also been considered to enable alignment with the City's river valley and ravine system natural area management goals outlined in the Ribbon of Green. Vegetation management methods and administrative controls based on fuel type are provided in **Appendix D**.

Vegetation Management Priority Areas

Utilizing both the 30-metre (radiant heat) and 100-metre (short-range ember transport) exposure models, the City has identified two critical zones for prioritized vegetation management: the river valley and ravine system, and the Anthony Henday Drive Transportation Utility Corridor (TUC). These corridors are classified as high-to-extreme exposure areas due to the presence of vast, contiguous stretches of natural and semi-maintained vegetation that can sustain significant fire activity (**Figures 8, 9,** and **22**).

The river valley and ravine system includes the North Saskatchewan River Valley, larger ravine systems such as the Whitemud Creek Ravine, the Blackmud Creek Ravine, and the Mill Creek Ravine, as well as smaller ravines such as Wedgewood Ravine, Mackenzie Ravine, Fulton Ravine, and Kennedale Ravine. Many of these areas fall within the reach of the Ribbon of Green.

Vegetation management interventions will be triaged based on fuel hazardousness and topographic risk. Priority is assigned to areas dominated by coniferous and coniferous-leading mixed wood forests, as well as unmaintained grasslands and shrublands. Furthermore, the City will prioritize management on steep slopes, where topographic effects can significantly accelerate fire spread and intensity.

To drive effective risk reduction, the City will undertake a systematic ground-truthing program to validate fuel loads and site conditions within the river valley and ravine system. This field data will form the foundation for detailed,

site-specific treatment plans, ensuring that mitigation resources are deployed where they will provide the greatest level of community protection.

Figure 22 shows wildland vegetation categorized by fuel hazard level, which, along with the exposure maps, values at risk data, will inform the identification of priority areas for ground truthing and fuel treatment plans. Wildland fuels with a low hazard level are not shown as they are unlikely to pose a significant, contiguous wildfire risk and are not a priority for vegetation management.

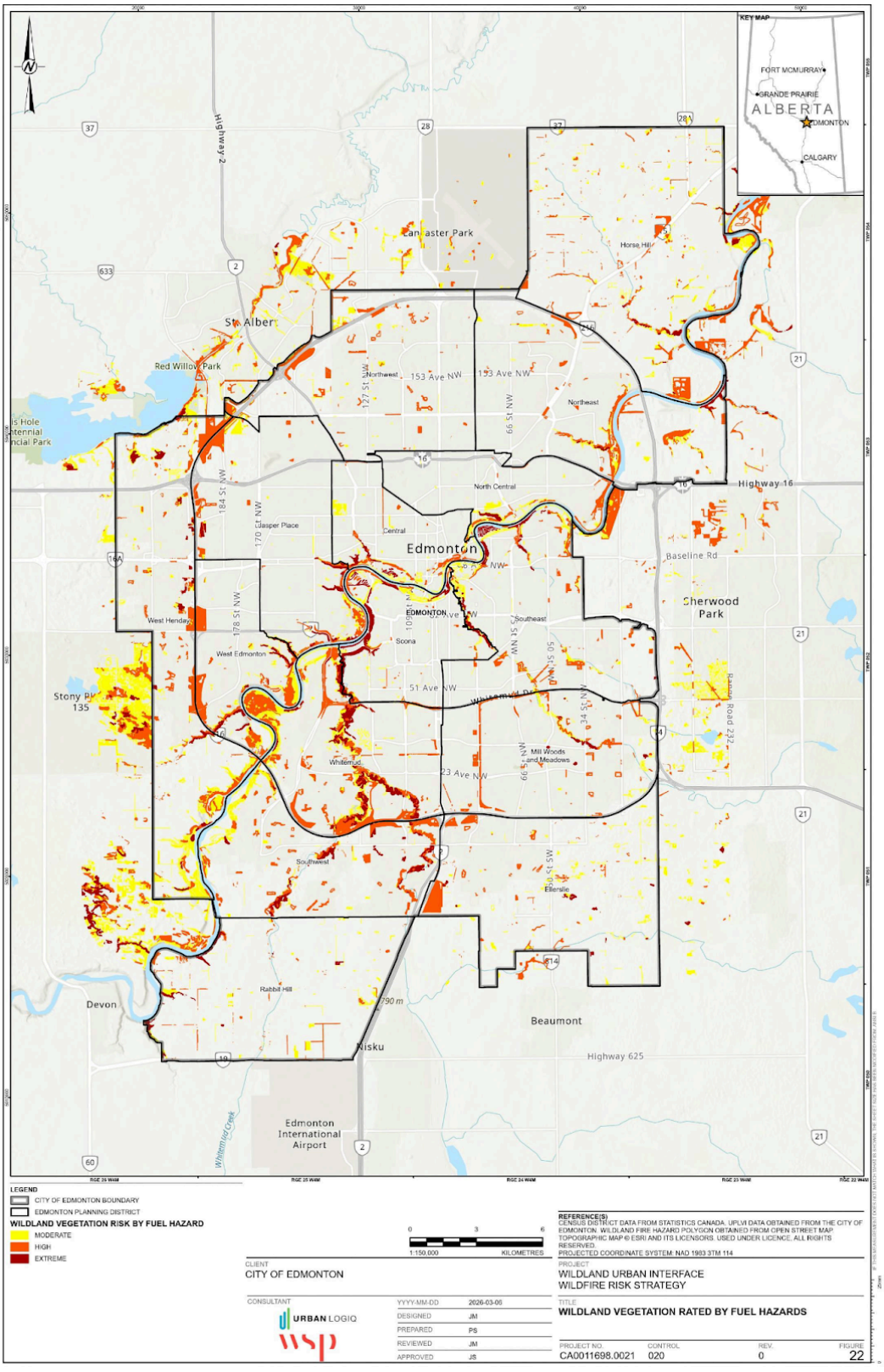

***Figure** 22: Wildland Vegetation Rated by Fuel Hazard Rating (see Table 7 for fuel hazard ratings).*

Heavy recreational use within the river valley and ravine system presents an increased ignition risk due to the concentration of human activity. To mitigate this, priority will be given to vegetation management activities immediately adjacent to identified values-at-risk as well as heavily used corridors, such as trails, picnic sites, and park facilities.

The Anthony Henday Drive transportation utility corridor (TUC) presents a unique wildfire risk due to its vast areas of unmaintained vegetation and its proximity to high-traffic volumes. Because these lands are owned by the Province of Alberta, management of this corridor is multi-jurisdictional. Continued engagement and collaboration with the Province of Alberta will be maintained so that vegetation management activities meet collective risk-reduction needs. Similar collaborative requirements will apply to other major roadways and transmission utility corridors managed by external utility companies. Because trees with sufficient height and proximity to contact utility lines pose a significant ignition risk, ongoing engagement and collaboration with utility providers will be essential to provide regular pruning and maintenance. By aligning municipal efforts with those of external partners and other orders of government, a unified approach will be taken to reduce collective wildfire risk across the region.

Vegetation Management Action Plan

A detailed vegetation management action plan is presented in **Table 8**, outlining the strategic initiatives designed to enhance Edmonton's wildfire resilience. For each entry, the plan provides a unique action identifier, a comprehensive description of the initiative, and the specific spatial or organizational scale at which the action will be taken. To support project management, resource allocation, monitoring, and reporting the table further details the relevant FireSmart disciplines, the implementation timeline, a generalized rating of the relative cost and impact for each action, and potential key performance indicators. Progress will be measured and monitored using tangible, numerical metrics to track implementation progress across the Wildland-Urban Interface.

Ratings are based on the standardized criteria provided in **Table 6** at the beginning of **Section 5**. Consistent with the City's commitment to adaptive management, these prioritized actions will help guide annual implementation plans and long-term capital investments, ensuring that resources are directed toward the most effective mitigation strategies as community needs and wildfire risks evolve.

Table 8. *Vegetation Management Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
VM1	**Expand a Wildland Fuel Treatment Program** + Use the Fire Exposure Assessment (FEA) as the foundational planning tool for the Wildland Fuel Treatment Program. Prioritize ground-truthing and field-based vegetation inventories in all high fuel hazard areas to develop science-based, site-specific fuel treatment plans across forested areas within the WUI. + Establish a Trailside Fuel Treatment Program to reduce excess combustible woody debris accumulation along recreational trails in ravine areas and parks. Conduct recurring field assessments and treatments in high-risk forest stands to create defensible corridors and reduce fire spread potential near residential areas. + Implement a Grassland Fuel Management Program to monitor and reduce tall dry grasses near public parks, natural assets, and other valued City assets. Construct permanent and seasonal fuel breaks (e.g. gravel pathways or mown buffer zones) between native, unmaintained grasslands and built infrastructure. + Scale up the use of prescribed fire to support habitat renewal and biodiversity. Develop a Prescribed Burning Program with established burn plans, trained burn crews, defined seasonal burn windows, and community engagement protocols. Prioritize high and moderate-risk WUI areas and meaningfully integrate Indigenous Traditional Knowledge and land stewardship practices into all phases of burns. + Leverage the Wildland Fuel Treatment Program as a strategic vehicle for integrated vegetation stewardship by using treatment activities to control invasive plant species and reintroduce native, fire-adapted species. + In alignment with the Top of Bank (TOB) Policy, formally designate TOB linear features (e.g., pathways, roadways) as structural fuel breaks and emergency access routes within the Wildland Fuel Treatment Program. Prioritize vegetation management and pathway expansion in high fire-exposure areas identified through the FEA and enforce a minimum 15 m TOB setback wherever operationally feasible.	Vegetation Management, Cross Training, Development, Emergency Planning	WUI-Specific	4 years	High	High	+ Annual hectares of mechanical fuel treatments completed within the WUI. + Annual linear distance (km) of fuel treatments completed along trail corridors. + Annual hectares of prescribed burn treatments.

VM2	**Incentivize Property Owners within the WUI to Adopt Wildfire-resilient Vegetation Practices** + Incentivize residents to adopt wildfire-resilient vegetation management practices, through grants, rebates, or community pilot programs (e.g., community chipping program). Objectives should include wildfire-resilient vegetation management activities and prioritizing preferred vegetation for shelterbelts, privacy screens, and yard ornamentals.	Vegetation Management, Development, Interagency Cooperation	WUI-Specific	3 years	Medium	Medium	+ Program Launch: Establishment of an incentive program. + Program Participation: Annual count of mitigation grant and/or rebate applications.
VM3	**Develop Wildfire Resilient Landscape Design and Construction Standards for Public Parks, Environmental Reserves, and Top of Bank Areas** + Develop and refine standards and operational SOPs for tree species selection, planting, density, and maintenance across city-owned properties, including public parks, environmental reserves, and top-of-bank areas, that consider site-specific factors in alignment with this strategy. Standards may be tiered based on park type, intensity of use, and proximity to the Wildland Urban Interface (WUI) or other valued assets, prioritizing the transition to drought, heat, and fire-resistant species to enhance climate resilience.	Vegetation Management, Development	WUI-Specific	4 years	Low	Medium	+ Standard Completion: Completion and adoption of fire-resilient design standards.

5.1.1.2 Legislation and Development

FireSmart's approaches to regulating site development can overlap with priorities related to land use and development planning. Given the related interests between these disciplines, recommendations have been combined in this Strategy.

Municipal land use planning policies, regulations, and development standards can be used to standardize and enforce wildfire-resilient development in the WUI. By embedding wildfire mitigation actions into municipal policies and regulations, wildfire resilience becomes a core element of sustainable development. These actions will focus on strengthening the resilience of both new and existing properties through updated standards and ongoing incentive programs.

At the property and neighbourhood levels, key steps will be taken to incorporate FireSmart principles where appropriate. To mitigate risk in high risk WUI areas, new Zoning Bylaw regulations will be explored. The City's Design and Construction Standards as well as other planning policies and guidelines will also be examined to determine opportunities to incorporate guidance on wildfire-resilient development..

The City will continue to use existing policies, including the Top-of-Bank Policy, the Ribbon of Green Strategy, and the Urban Forestry Management Plan, as opportunities to include more specific direction on wildfire risk management. Efforts will also focus on developing a Climate Risk Index for Edmonton neighborhoods to better inform long-term planning. These priorities align with public feedback, which expressed strong support for more proactive management and enhanced incentive programs to support FireSmart improvements on existing properties.

Legislation and Development Action Plan

A detailed legislation and development action plan is presented in **Table 9**, outlining the strategic initiatives designed to institutionalize wildfire resilience. For each entry, the plan provides a unique action identifier, the initiative's name and description, and the specific spatial or organizational scale at which the action will be taken. To support project management and resource allocation, the table further details the relevant FireSmart disciplines, the implementation timeline, a generalized rating of the relative cost and impact for each action, and potential key performance indicators to enable progress to be tracked and measured effectively through annual implementation planning and reporting.

***Table 9**. Legislation and Development Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
LD1	**Implement Wildfire Resilience Measures into the Zoning Bylaw** + Through Action 6 of the CRPD Action Plan and under the authority of Part 17, Section 624 of the Municipal Governance Act, add a Wildfire Resilience Overlay to the Zoning Bylaw that clearly maps which properties are within the regulated wildland-urban interface and apply appropriate zoning regulations to applicable types of development in order to mitigate wildfire risk.	Legislation, Development, Education, Emergency Planning	WUI-Specific	2 years	Low	High	+ WUI Regulatory Integration: Completion of the Wildfire Resilience Overlay and its formal adoption into the Zoning Bylaw.
LD2	**Update Governing Policies and Plans to Incorporate Wildfire Resilience** + Through Action 7 of the CRPD Action Plan, identify opportunities to integrate wildfire risk mitigation standards in WUI areas within the City's Design and Construction Standards. + Through Action 8 of the CRPD Action Plan, identify priority design outcomes that support wildfire resilience through neighbourhood design. + Review and update the Ribbon of Green Strategy, Urban Forest Asset Management Plan, and City-Wide Natural Area Management Plan to integrate wildfire risk mitigation into park design, operations, and vegetation management in natural areas. When implementing the Breathe: Green Network Strategy, look for opportunities to integrate wildfire resilience. + When updating the City Plan and District Plans, determine whether appropriate direction from the Wildfire Risk Strategy can be incorporated to inform future land use.	Education, Vegetation Management, Legislation, Development	City-Wide	Ongoing	Low	Medium	+ Policy Integration: % of governing documents (e.g., City Plan, Breathe) updated with wildfire resilience language. + Operational Alignment: % of management plans (e.g., Forestry, Natural assets) with synchronized vegetation protocols.

5.1.2 Educate: Increase Wildfire Awareness and Preparedness by Engaging the Community, Providing Accessible Information, and Supporting Local Initiatives

Education actions focus on promoting wildfire awareness and preparedness through community engagement. An informed and empowered community is a resilient community. Education actions focus on promoting wildfire awareness and preparedness through community engagement. An informed and empowered community is a resilient community; therefore, public education is a key discipline of FireSmart and a fundamental component of the WUI Wildfire Risk Strategy. Public education and communication approaches represent a whole-of-society effort to build awareness around a culture of wildfire prevention and responsible behaviours in the WUI. Many of these initiatives will be City-led and focus on improving education programs and public messaging about wildfire risk in the WUI, though there is also a need for strong communication and education programs within and across City departments and opportunities for community-led initiatives (e.g., the FireSmart Neighbourhood Recognition Program).

The Education discipline integrates and reinforces all other FireSmart disciplines. For example, lessons from Vegetation management activities inform defensible space. Insights from emergency planning (below) shape community preparedness. Knowledge from development and interagency cooperation (below) supports consistent messaging and coordinated action across all partners. In this way, Education actions are not standalone activities, but the thread that connects every FireSmart practice across the city.

As part of the development of this Strategy, the City undertook an extensive engagement campaign to better understand residents' awareness of wildfire risk in Edmonton, inform residents of the development of the WUI Wildfire Risk Strategy, and gather resident input on preferences for mitigation activities. The public engagement process is summarized further in **Section 3.4** above and in the What We Heard and Did Report [20]. In addition to the engagement efforts undertaken during the development of this Strategy, Edmonton Fire Rescue Services (EFRS) has been delivering FireSmart education and outreach presentations to internal and external stakeholders to build wildfire awareness. This includes sharing information, supporting FireSmart presentations and working with interested communities and FireSmart Neighbourhood Champions to help navigate the FireSmart Neighbourhood Recognition Program.

While previous efforts have helped build awareness of wildfire risk in Edmonton, further work will be taken to sustain community engagement and information sharing. Targeted education programs will be developed to deliver the necessary information and resources to residents using a range of tactics. These initiatives will focus on ensuring that engagement is both consistent and tailored to the specific needs of residents living in high-risk WUI areas.

+ **Indigenous Engagement:** Continued inclusion of Indigenous-led work in climate action. The translation of resources into Indigenous languages and support for Indigenous communities to complete their own hazard assessments.

+ **Tailored Wildfire Education:** Audience-specific education materials, including translated materials, to support education for newcomers to Edmonton.
+ **Youth and School Engagement:** Integration of wildfire education into school outreach programs.
+ **Emergency Preparedness Tools:** Evacuation route maps, shelter-in-place guidance, and "go-bag" instructions.
+ **Reaching Vulnerable Populations:** Outreach to reach and protect vulnerable populations, including unhoused populations, seniors, and people with disabilities. This includes working with partner organizations engaged with target populations.

These priorities form the basis for the education action plan presented below.

Education Action Plan

An education action plan is presented in **Table 10**, outlining the strategic initiatives designed to enhance community awareness and wildfire preparedness. The plan provides a unique action identifier, the name and description of the initiative, and the specific spatial or organizational scale at which the action will be taken. To support project management and resource allocation, the table further details the relevant FireSmart disciplines, the implementation timeline, a generalized rating of the relative cost and impact for each action, and potential key performance indicators for ongoing monitoring and reporting.

***Table 10**. Education Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
ED1	**FireSmart Engagement and Education Program** + Continue to champion the FireSmart program in collaboration with FireSmart Alberta with focused consideration for properties in areas exposed to wildland fuels. + Distribute educational resources through physical mailouts to properties residing in the WUI and utilize social media communications for wider educational purposes. + Deliver FireSmart presentations at public events. + Promote the FireSmart Neighbourhood Recognition Program (NRP) and work with neighbourhood champions and committees to share resources and support volunteer neighbourhood events and the NRP process. Encourage community participation. + Conduct periodic surveys to measure wildfire awareness and education program effectiveness. Refine outreach strategies and track progress over time.	Education, Cross Training	City-Wide	1 years	Medium	High	+ Outreach Impact: Total volume of physical mailouts and digital engagement on wildfire campaigns. + Neighborhood Recognition: Annual number of communities achieving or renewing FireSmart NRP status. + Program Uptake: Measured increase in community access to resources and program participation.

5.1.3 Respond: Support Integrated Emergency Responses and Wildfire Training across City Departments

Actions under the Respond pillar support integrated emergency responses and wildfire training across City departments to support a cohesive and effective reaction to wildland fire events. A unified approach will be taken to operational readiness by comprehensive emergency response planning, expanding data collection and monitoring, and ensuring all partners involved are adequately trained and prepared. The following two subsections explore the FireSmart disciplines of emergency planning and cross training.

5.1.3.1 Emergency Planning

Effective emergency planning transforms preparedness into action. The emergency planning discipline of FireSmart focuses on enabling communities to be ready to respond quickly, efficiently, and safely when wildfire threats emerge. While wildfire remains a key hazard, the City of Edmonton's emergency and evacuation planning follows an all-hazards model. By centering municipal processes on the Emergency Management Act and the Local Authority Emergency Management Regulation, the City maintains adaptable systems designed to protect residents and responders across a wide spectrum of risks. This approach supports operational readiness meeting all provincial legislative requirements while remaining flexible for all potential emergency events, including WUI fires.

The Municipal Emergency Plan is reviewed and updated annually. This document establishes a framework for the City to manage and coordinate the prevention, mitigation, preparedness, response, and recovery activities for all hazards that might impact the City and its residents. It identifies the key decision points, governance structures, and procedures for the City to effectively and efficiently respond to an emergency that may require response and resources that cannot be provided through normal operations.

Two of the main sections responsible for organizing an effective wildfire response are Edmonton Fire Rescue Services (EFRS), which is responsible for on-the-ground firefighting response, and the Office of Emergency Management (OEM), which sits within the Community Safety and Risk section of the EFRS branch and is responsible for emergency management coordination and public alerting. In the event of a significant fire, these organizations work quickly to initiate emergency response procedures, commence fire suppression, establish needs for resident notification and safety measures, and collaborate response efforts with other supporting organizations like Wildfire Alberta and the Canadian Red Cross. EFRS has established a WUI-specific training module for all recruits to gain knowledge of the differences between structural and wildfire behaviour and response, which is discussed further in the following section on cross training.

To monitor wildfire activity and hazardous weather conditions, the OEM utilizes the expertise from Alberta Wildfire Services and the Community Safety and Risk section, such as Fire Protection Engineers. The City is also developing digital tools, such as EmberWise, to assist in wildfire risk monitoring and early hazard identification in order to inform a targeted and rapid response. EmberWise is a City of

Edmonton-specific fire weather forecasting tool. This program draws data from provincial fire weather index (FWI) models and Edmonton-specific fuel, topography, and weather values to predict fire weather in any location in Edmonton. Daily briefings are generated from the system and provided to EFRS leadership, dispatch, and other parties who may benefit from the information.

Finally, it is necessary to practice emergency response procedures. To this end, a WUI Tabletop Exercise (TTX) facilitated by the OEM and EFRS was completed in 2025. This exercise included 15 EFRS staff who completed 4-hour sessions within the Emergency Coordination Centre. This exercise focused on enhancing collective wildfire response abilities, including communication protocols, validating existing EFRS WUI emergency response plans, and identifying/testing current internal and external primary and secondary resources. Key recommendations identified through the TTX relevant to emergency management included:

+ Increase the Frequency and Realism of WUI Training Exercises
+ Emphasize Hazard-Based Dispatch of WUI Resources
+ Explore and Integrate Predictive Fire Behaviour Tools
+ Review Initial Size-Up Procedures for WUI Events
+ Develop Media Management Protocols

Additional recommendations from the WUI TTX are highlighted in the following subsections on Cross Training (**Section 5.1.3.2**) and Interagency Cooperation (**Section 5.1.4)**.

Responses to public engagement activities during the development of the WUI Wildfire Risk Strategy highlighted that Edmonton residents generally feel unprepared for an emergency evacuation and have limited awareness of wildfire risk reduction and emergency planning programs in the City. Public comments reflect a desire for more information to help them understand wildfire risks in Edmonton. Residents generally support proactive risk mitigation efforts like vegetation management, fuel breaks, and fire-resistant building practices as more cost-effective strategies than increased emergency response efforts. They also recognize the importance of establishing evacuation plans and improving firefighting resources in WUI areas to minimize damage and risk to human life and safety during an emergency.

Through proactive emergency planning, the City of Edmonton will continue to strengthen situational awareness, enhance response capacity, and support every department, responder, and resident to act effectively when wildfire conditions arise.

Emergency Planning Action Plan

An emergency planning action plan is presented in Table 11, outlining strategic initiatives designed to enhance response capabilities in and around the Wildland-Urban Interface. For each entry, the plan provides a unique action identifier, the name and description of the initiative, and the specific spatial or organizational scale at which the action will be taken. To support effective implementation, the table further details the relevant FireSmart disciplines, the lead

department responsible for the action, the implementation timeline, a generalized rating of the relative cost and impact, and potential key performance indicators for ongoing monitoring and reporting.

***Table 11**. Emergency Planning Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
EP1	**Develop Structure Protection Plans (SPPs)** + Develop structure protection plans for critical infrastructure in high-risk WUI areas and neighbourhoods based on wildfire hazard risk assessments. Neighbourhood-level and/or asset-specific risk assessment should be informed by wildfire exposure mapping and in-field validation of fuel hazards and structure vulnerabilities. Make structure protection plans available to and understood by City teams involved in response efforts.	Emergency Planning, Cross Training, Interagency Cooperation	WUI-Specific	2 years	High	High	+ Asset Protection: % of critical infrastructure in high-risk zones with a validated SPP. + Personnel Readiness: % of emergency response personnel trained or oriented on localized SPPs. + Plan Currency: % of protection plans updated to reflect new developments or fuel hazards.

EP2	**Develop a Wildfire Data Collection and Monitoring Program** + Establish real-time inter-departmental wildfire data sharing to delineate fire extents and gather essential data for post-wildfire assessments and ecological monitoring. + Continue developing the EmberWise Tool and drone overwatch program to improve wildfire monitoring and response. During periods of High to Extreme wildfire weather, utilize the City's drone overwatch program and EmberWise platform to closely monitor Fire Hazards in WUI areas. Drones should be launched immediately upon receipt of a 911 call about a wildfire to assist with initial size-up and ongoing monitoring of response efforts. + Develop a multi-layer GIS map that has all critical infrastructure (including gas lines, power lines, water lines), wildfire exposure layers, and evac routes to support first responder size-up and response planning. The map/application should be user-friendly to support easy in-field operations. + Utilize dual-use city and traffic cameras to monitor heat, fire migration, evacuation progress, security of property, among others.	Development, Emergency Planning, Vegetation Management, Education	City-Wide	3 years	High	High	+ System Integration: Establishment of real-time, inter-departmental wildfire data-sharing protocols. + Monitoring Compliance: % of target flights achieved of scheduled drone monitoring flights. + Operational Readiness: Completion and field-usability of the multi-layer GIS emergency response map. + Surveillance Coverage: % of high-risk WUI areas monitored via drones and sensors.
EP3	**Expand Tactical Emergency Wildland Response Planning** + Establish standards for wildfire-fighting equipment/apparatus for all fire stations/trucks with significant WUI areas in their district. Consider stocking a reserve apparatus at fire stations in high-risk WUI areas during periods of high fire danger. + Increase firefighting staffing during periods of high fire danger at fire stations with significant WUI coverage. Extra staffing should be planned for in the early spring before vegetation green up and in mid to late summer during hot and dry conditions. + Integrate wildfire considerations into an all-hazards evacuation plan in alignment with provincial requirements. The plans should clearly outline procedures for early warning systems, evacuation routes, and communication strategies.	Emergency Planning, Interagency Cooperation, Cross Training, Development	City-Wide	Ongoing	High	Medium	+ Standardization Compliance: % of WUI-district stations achieving 100% adherence to the new wildland equipment and reserve apparatus standards. + Peak-Risk Coverage: % of "High" to "Extreme" fire danger days where augmented staffing targets were fully met in high-risk districts.

EP4	**Review Risks to City Facilities and Response Infrastructure** + Review the locations of city-owned facilities and/or critical infrastructure that may be in WUI areas. If assets are exposed to potential fire hazards, consider structure protection improvements and/or secondary backup locations/resources that could be used to support operations in an emergency WUI fire.	Emergency Planning	WUI-Specific	3 years	Medium	Medium	+ Facility Assessment: % of WUI-based City facilities with a completed FireSmart assessment. + Resilience Upgrades: Number of high-priority facilities with integrated secondary power or structural protection improvements.

5.1.3.2 Cross Training

The Cross Training discipline of FireSmart focuses on building interoperability, shared capability, and a common understanding of wildfire prevention and response practices across all organizations involved in wildfire management. Wildfire resilience depends not only on specialized knowledge but on the ability of diverse teams, including municipal staff, emergency services, planners, utilities, park operations, and community partners, to work together effectively under pressure. In Edmonton's WUI, cross training enables everyone involved in reducing wildfire risk and protecting the community to act as a cohesive, coordinated unit. Cross training bridges the gaps between prevention and response, planning and operations, and policy and field application.

EFRS has established a WUI-specific training module for all recruits to gain knowledge of the differences between structural and wildfire behaviour and response. This training provides a strong foundation for EFRS staff to prepare for WUI fire responses but also contains valuable information on factors that influence fire behaviour to inform vegetation management and infrastructure requirements for effective evacuation and firefighting responses. Building on existing EFRS training, specialized programs will be developed for other City departments to institutionalize a shared understanding of local wildfire hazards and the specific roles required for risk management, response, and recovery. Strategic opportunities for EFRS to collaborate with Natural Areas Operations and Parks staff will be utilized to enhance cross-training on wildland fuel reduction activities, particularly prescribed burns. These initiatives will focus on scaling successful pilot programs to support a high level of inter-departmental competency and operational alignment.

The most recent cross training initiative undertaken by the City was the 2025 WUI Tabletop Exercise (described in section 5.1.3.1), which tested emergency response procedures and identified strengths and weaknesses in WUI-related emergency training. The key recommendations emerging from this exercise, related to cross training, include:

+ Increase the Frequency and Realism of WUI Training Exercises
+ Incorporate Task Force Concepts into Incident Command Training and Procedures
+ Enhance Training on Strategic Planning and Decision-Making
+ Conduct Further Training on Emergency Coordination Centre (ECC) Activation and Functions
+ Continue to Support and Implement WUI Training Standards

By formally integrating cross training into Edmonton's approach to wildfire preparedness, the City will strengthen operational readiness, foster collaboration, and support team members, from planners to responders, to understand how their role contributes to a unified, fire-resilient Edmonton.

Cross Training Action Plan

A cross-training action plan is presented in **Table 12**, outlining priority initiatives to enhance integrated response capabilities across all municipal departments. These

actions will include a combination of formal training programs, workshops, tabletop exercises, field simulations, and after-action reviews. Such activities will be utilized to promote the consistent application of FireSmart practices and foster institutional learning across all levels of the organization and its partner agencies.

For each entry, the plan provides a unique action identifier, the name and description of the initiative, and the specific spatial or organizational scale at which the action will be taken. The table further details the relevant FireSmart disciplines, the implementation timeline, and a generalized rating of the relative cost and impact for each action. These ratings are based on the standardized criteria provided in **Table 6** at the beginning of **Section 5**. The final column includes potential Key Performance Indicators (KPIs) to enable progress in cross-departmental readiness to be measured and tracked effectively.

***Table 12**. Cross Training Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
CT1	**Expand Tactical Emergency Wildland Response Training Program** + Develop a training and certification program for municipal staff and partner agencies to increase organizational awareness and capacity for wildfire risk management and response. The program should highlight key wildfire initiatives and the responsibilities of various municipal departments, and when they apply (e.g., Prevention, Mitigation, Preparedness, Response, Recovery) and a Continuous Improvement system. + Provide accreditation and specialized training for all EFRS recruits and existing staff focused on standards for WUI fire response and Incident Command System training. + Conduct joint training exercises and simulations with local public safety partners and supporting organizations.	Emergency Planning, Cross Training, Interagency Cooperation	City-Wide	3 years	High	Medium	+ Personnel Accreditation: % of EFRS personnel and recruits with NFPA-compliant wildland firefighting accreditation. + Operational Drills: Completion and validation of an annual joint simulation or tabletop wildfire exercise. + Operational Readiness: Adherence to provincial training requirements for employees with key emergency management responsibilities.

5.1.4 Coordinate: Collaborate with Neighbouring Jurisdictions and External Agencies to Build Regional Resilience

The final pillar of effective wildfire risk mitigation and response is rooted in the FireSmart discipline of Interagency Cooperation. This requires an outward-looking perspective on the neighboring jurisdictions and partner organizations that will work with Edmonton to manage wildfire risk and improve response and recovery efforts. Key participants in Interagency cooperation include Edmonton Fire Rescue Services, the Office of Emergency Management, City Operations and Urban Planning and Economy as well as Alberta Wildfire, EPCOR, utility providers, neighbouring municipalities, Indigenous Partners, and community organizations. Collaboration can also lead to increased opportunities for accessing funding supports, sharing knowledge and data, and strengthening response efforts in the event of a wildfire. A coordinated approach enables wildfire mitigation that is not addressed in isolation, but as an integrated part of the City's broader risk management and resilience framework.

Interagency cooperation also enhances the effectiveness of all other FireSmart disciplines. Vegetation management efforts rely on coordinated maintenance and jurisdictional clarity; development decisions benefit from integrated planning across departments; Emergency Planning depends on shared intelligence and operational protocols; Education is strengthened by consistent messaging across agencies; and Legislation and policy can only be enforced effectively when developed collaboratively. Each discipline informs and depends upon the other, making cooperation the backbone of the City's wildfire resilience.

The City has initiated efforts toward improved interagency cooperation on WUI wildfires in recent years, most notably the WUI Tabletop Exercise completed in 2025 (outlined in **Section 5.1.3.1**). Key recommendations relevant to interagency cooperation identified through the Tabletop exercise included:

+ Address Inter-Agency Radio Communication Interoperability
+ Finalize and Streamline Mutual Aid Agreements

The City has mutual aid agreements with most neighbouring municipalities and counties through a variety of frameworks, including the Capital Region Mutual Aid agreement (annual term) and the City of Edmonton Fire Services Aid agreement (10-year term). In addition to these fixed-term arrangements, the City maintains evergreen agreements that remain in effect indefinitely unless specifically modified. Mutual aid agreements seek to improve regional emergency response capabilities by formalizing roles and responsibilities, confirming equipment availability, and addressing other vital logistical elements for all partners during emergencies. These are reciprocal agreements that state Edmonton will receive and offer support to neighbouring communities in times of need.

Further opportunities to enhance regional wildfire resilience include the development of Intermunicipal Development Plans (IDP). These high-level statutory plans are required under the Municipal Governance Act for municipalities sharing a common border, as Edmonton does with eight neighbours. When applied to wildfire risk management, IDPs can inform land use, transportation, and environmental matters across jurisdictions to reduce vulnerabilities. This collaborative approach would enable wildfire mitigation strategies to be consistent and effective at a

regional scale, recognizing that wildfire hazards do not respect municipal borders. As the first municipality in the capital region to undertake the development of a comprehensive Wildfire Risk Strategy, Edmonton is well-positioned to be a leader, setting the direction for effective wildfire risk management when collaborating on IDPs.

Interagency Cooperation Action Plan

An interagency cooperation action plan is presented in **Table 13**, outlining strategic initiatives designed to strengthen collaborative wildfire management. For each entry, the plan provides a unique action identifier, the name and description of the initiative, and the specific spatial or organizational scale at which the action will be taken. To support effective coordination and resource allocation, the table further details the relevant FireSmart disciplines, the implementation timeline, and a generalized rating of the relative cost and impact for each action.

These ratings are based on the standardized criteria provided in Table 6 at the beginning of **Section 5**. The final column in the table includes potential Key Performance Indicators (KPIs) for each action to enable the progress of interagency partnerships to be tracked and measured effectively.

***Table 13**. Interagency Cooperation Action Plan*

Action ID	Action Description	Relevant FireSmart Disciplines	Scale	Timeline	Cost	Impact	Key Performance Indicators
IC1	**Establish a FireSmart Action Group** + Create a cross-departmental group to establish and monitor annual implementation plans and report on progress to leadership and Council. + Collaborate with utilities, transportation agencies, and industrial operators to encourage the development of wildfire mitigation plans on large private properties and utility corridors. Align FireSmart principles across critical infrastructure sectors. + Collaborate with external agencies, including surrounding municipalities, Indigenous partners, utility companies, community organizations, and other governmental agencies to align on FireSmart disciplines and progress. + Establish a group Chair and Lead Coordinator and create a Terms of Reference for roles for all group members (internal and external).	Emergency Planning, Cross Training, Interagency Cooperation, All	Regional	2 Years	Medium	High	+ Group Launch: Establishment of the FireSmart Action Group. + Program Governance: Approval of the FireSmart Action Group Terms of Reference and the appointment of a Chair and Lead Coordinator. + Annual Progress: Completion of an annual report detailing strategy implementation and performance.
IC2	**Collaborative Prescribed & Cultural Burn Program** + Use City-led prescribed and cultural burns as opportunities for joint training with Indigenous partners, for education and academic research, and to integrate and advance the COE's Indigenous Framework. Promote traditional fire stewardship and vegetation management best practices.	Vegetation Management, Education, Cross Training, Interagency Cooperation	Regional	2 years	Medium	Medium	+ Burn Footprint: Annual hectares of cultural burn treatments. + Indigenous Collaboration: Number of burn events co-led with Indigenous knowledge keepers and practitioners. + Ecological Recovery: % of burn sites showing improved biodiversity post-assessment.
IC3	**Review and Update Mutual Aid Agreements** + At the next renewal of Mutual Aid Agreements, consider the need for wildfire responses and planning updates. Use the renewal process as an opportunity to connect with neighbouring municipalities to align on wildfire risk management approaches and response procedures. Consider opportunities for communication systems and other resource sharing.	Emergency Planning, Interagency Cooperation	Regional	Ongoing	Low	Low	+ Mutual Aid Updates: Number of Mutual Aid Agreements updated.

5.2 Potential Funding Sources for Actions

External funding opportunities have been identified that support ongoing wildfire mitigation and preparedness work. The City could consider exploring the following external funding opportunities as needed to supplement internal budgets and resource requirements. Potential, existing, external funding sources of note include:

+ **Forest Resource Improvement Association of Alberta (FRIAA) FireSmart Program.** This program supports communities in carrying out activities to reduce the impact of wildfires across Alberta. It provides funds up to $200,000 CAD for operational expenditures related to any of the seven FireSmart disciplines. Applications are considered twice per year, typically in the summer and winter, subject to funding availability.

+ **Green Municipal Fund's Climate Adaptation in Action: Implementation Projects.** This program supports long-term climate adaptation projects for communities to implement projects to adjust and respond to the impacts of climate change. It provides funds up to 60% of the eligible costs up to $1,000,000 CAD. Municipal governments are among the eligible recipients and projects can include modifying the landscape to reduce wildfire risks. Emergency response and recovery projects are not eligible for funding. Projects should proactively address the impacts of climate change [21].

+ **Wawanesa's Community Wildfire Prevention Grant.** Wawanesa is an insurance company with a Wawanesa Climate Champions commitment that includes a Community Wildfire Prevention Grant in partnership with FireSmart Canada and the Institute for Catastrophic Loss Reduction (ICLR). They offer grants for smaller-scale wildfire prevention projects, up to $20,000. The grants are intended to foster cultures of wildfire prevention; therefore, funded projects are aimed at mitigating or preventing damages to communities from wildfires. Projects must align with at least one of the FireSmart disciplines. Wildfire response or suppression equipment and prescribed burn activities are not eligible for this funding [22].

6. Conclusions

Edmonton's first WUI Wildfire Risk Strategy marks a pivotal step in strengthening the City's resilience against increasing wildfire risk. The Strategy utilizes advanced fire exposure mapping and inter-departmental collaboration to identify proactive, coordinated actions that reduce risk to communities, infrastructure, and natural assets. Built on four strategic pillars below, the Strategy translates technical findings and community priorities into clear, actionable pathways for implementation:

+ **Reduce:** Advancing vegetation management, updated development standards, and defensible-space practices.
+ **Educate:** Prioritizing sustained, audience-specific outreach to build shared capacity across neighborhoods.
+ **Respond:** Strengthening emergency planning and cross-departmental training to support rapid, coordinated action.
+ **Coordinate:** Enhancing regional partnerships and interagency alignment across municipal boundaries.

Wildfire resilience is a continuous process requiring ongoing monitoring and adaptation. As climate conditions and urban development evolve, the City will maintain a commitment to iterative, collaborative actions that allow Edmonton to adapt to a changing environment. Progress will be tracked through key performance indicators to enable successful implementation across all departments. To remain aligned with the municipal budget cycle and evolving priorities, the Strategy will be reviewed and updated every four years. Through sustained commitment and adaptive management, Edmonton will advance its vision of a safer, more wildfire-resilient future.

Glossary

Adaptation: The process of adjusting systems, practices, and structures to reduce harm associated with climate change and wildfire risk. In wildfire contexts, adaptation includes measures like vegetation management and building retrofits.

Climate: The long-term patterns of temperature, precipitation, wind, and other atmospheric conditions in a region.

Defensible Space: A managed buffer around a structure where flammable materials are reduced to increase the chances of a structure's survival from a wildfire.

Embers: Small burning pieces of vegetation and/or structures that can become airborne and transported by wind.

Ember transport and spotting: When burning wildfire embers are carried by the wind and travel ahead of the main fire, igniting new fires.

Exposure: The presence of people, property, infrastructure, or ecosystems in areas where they could be adversely affected by wildfire hazards.

FireSmart: A national program to help Canadians increase neighbourhood resilience to wildfire and minimize its negative impacts. FireSmart Alberta is the provincial implementation of the national FireSmart Canada program.

Fire weather: Weather conditions that influence wildfire ignition, spread, and intensity, including temperature, humidity, wind speed, and precipitation.

Fuel conversion: Introducing plants that are less likely to ignite and spread fire in key WUI areas (e.g. removing coniferous trees and shrubs like spruce, pine and juniper, and replacing them with deciduous trees like aspen and birch).

Hazard: A natural or human-caused event or condition with the potential to cause harm. In wildfire contexts, hazards include fuel sources in the form of wildland vegetation that could be easily ignited and spread and a fire. A wildfire hazard can be modified by topography and weather conditions.

Home Ignition Zone: The immediate area around a home, extending up to 100 metres, where practical actions can be taken to reduce wildfire risk.

Interface: Distinct transition from wildland areas to urban development.

Intermix: Low-density development located within a primarily wildland area.

Ladder fuels: Vegetation that allows fire to climb from the ground into tree canopies, such as shrubs or low branches beneath taller trees. Ladder fuels increase the risk of crown fires.

Long-range ember transport: The movement of burning embers over distances greater than 100 metres, often carried by strong winds, which can ignite spot fires far ahead of the main wildfire front.

Mitigation: Actions taken to reduce the severity or likelihood of wildfire impacts. Examples include fuel reduction, defensible space creation, and FireSmart building retrofits.

Natural Assets: Edmonton's natural assets are divided into six categories - maintained trees, naturalization areas, naturally wooded areas, wetlands, naturally non-wooded areas, and naturally non-vegetated areas.

Occluded: Isolated patches of wildland surrounded by urban development.

Radiant heat: Heat energy emitted from burning structures or vegetation that can ignite nearby combustible materials without direct flame contact.

Risk: The combination of the likelihood of a wildfire hazard occurring and the potential consequences for exposed people, property, and ecosystems.

Short-range ember transport: The movement of burning embers over shorter distances, typically less than 100 metres, which can ignite nearby structures or vegetation.

Urban conflagration: The rapid spread of fire within built environments when multiple structures ignite and burn simultaneously. This phenomenon is often initiated by ember showers or radiant heat and can escalate quickly if there is insufficient separation or defensible space between combustible structures.

Vegetation management: An approach to mitigate wildfire risks by managing wildland fuels, specifically by controlling the amount, type, and location of fuel that can sustain a fire.

Vulnerability: The degree to which people, property, or ecosystems are susceptible to harm from wildfire hazards, influenced by factors such as building materials, preparedness, climate change, and adaptive capacity.

Wildfire: An unintentional and uncontrolled fire in an area with flammable vegetation.

Wildland fuel: Any combustible vegetation, living or dead, that can burn in a wildland fire, including grasses, shrubs, trees, leaves, and dead wood. The amount and type of fuel directly influence the intensity and behaviour of a wildfire, and fuels are categorized to help predict fire behaviour and manage fire risk.

Wildland vegetation: Vegetation found in undeveloped areas, including trees, shrubs, grasses and other herbaceous vegetation.

Wildland-Urban Interface (WUI): An area where human development (residential, industrial, agricultural) meets or is intermingled with wildland vegetation.

Abbreviations & Acronyns

AEMA: Alberta Emergency Management Agency

CIFFC: Canadian Interagency Forest Fire Centre

CRPD Action Plan: Climate Resilience Planning and Development Action Plan

EMO: Office of Emergency Management

ECC: Emergency Coordination Centre

EFRS: Edmonton Fire Rescue Services

EPS: Edmonton Police Service

FBP: Forest Fire Behaviour Prediction

FRIAA: Forest Resource Improvement Association of Alberta

FWI: Fire Weather Index

GCM: Global Climate Model

GHG: Greenhouse Gas

HIZ: Home Ignition Zone

IWUIC: International WUI Code

KPI: Key Performance Indicator

MWAP: Municipal Wildfire Assistance Program

NRC: National Research Council of Canada

PACE: Primary, Alternate, Contingency, Emergency

PIO: Public Information Officer

OSM: Open Street Maps

SME: Subject Matter Expert

TTX: Tabletop Exercise

TUC: Transportation Utility Corridor

uPLVI: Urban Primary Land and Vegetation Inventory

WUI: Wildland-Urban Interface

WRS: Wildfire Risk Strategy

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Appendix A: Methods

A.1 Jurisdictional Scan

A jurisdictional scan was conducted at the outset of the Strategy development to inform the modeling and mapping of wildfire risk, WUI delineation for regulatory purposes, and the development of risk mitigation strategies and recommendations for wildfire risk in the WUI. The scan employed a structured approach to identify, analyze, and compare jurisdictions in diverse contexts, applying the seven FireSmart disciplines through core wildfire risk initiatives. Specific comparison of jurisdictions' approaches to wildfire risk mapping and WUI delineation methods for regulatory purposes was also a core focus of the scan. Finally, a review of high-level costs of wildfire impacts and mitigation efforts referenced by each jurisdiction was considered, though little information on municipal budgets for wildfire planning and mitigation projects was publicly available.

The scan encompassed Edmonton and six additional jurisdictions that were selected for their leadership in WUI regulation, implementation of other wildfire risk strategies, and range of geographical contexts (City of Kelowna, Regional Municipality of Wood Buffalo, District of North Vancouver, City of Austin, City of Boulder, Greater Geelong Australia).

A systematic review of key documents was performed for each jurisdiction to ascertain current practices, understand leading practices among the jurisdictions, and assess alignment with FireSmart disciplines. Reviewed documents included:

+ Municipal wildfire risk assessments
+ Online mapping portals
+ Community wildfire protection plans
+ Zoning bylaws and regulatory frameworks
+ Municipal Development Plans (or equivalent)
+ FireSmart program implementation guides
+ Provincial/state and federal guidelines

Comparative analysis highlighted standard practices, regulatory innovations, and gaps, providing a foundation for recommendations applicable to the local Edmonton context.

A.2 Public Engagement

See the What We Heard And Did Report for more information on public engagement methodology and results [20].

A.3 Wildfire Exposure Modeling and Mapping

For this assessment, wildfire exposure is used as the primary metric for understanding risks related to wildfire hazards in Edmonton. As described in Section 4.1, a wildfire hazard is described by three components: fuel, topography, and weather. Of these components, fuel is the foundation for fire ignition and spread, dictating the maximum possible extent and reach of a fire, while topography and

weather can be considered modifiers that influence fire behaviour. Wildfire exposure, therefore, is primarily influenced by the proximity of infrastructure or valued assets to wildland fuels. The fireexposuR R package (developed by Air Forbes and Dr. Beverly [16]) was applied to model and map exposure in Edmonton's WUI. This model uses a nationally recognized method for mapping wildfire exposure in alignment with guidance from FireSmart Canada [23] and the National Guide on WUI Fires [24]. The model is being used by the Canadian National Research Council of Canada (NRC) to develop a national standard for wildfire exposure assessment.

The fireexposuR model is designed to assess wildfire exposure based on existing vegetation conditions and is not intended to predict future wildfire events. While the model does not guarantee identified areas will or will not experience wildfire impacts, the model is valuable for highlighting current areas of concern using the best available vegetation data. The model assesses fire exposure as a function of asset proximity to vegetation fuel hazards and the fire behaviour associated with each fuel type. The model evaluates exposure based on the ability of a given fuel type to contribute to three ignition processes:

+ Radiant heat: heat emitted from nearby flaming vegetation within 30 m
+ Short-range spotting (or short-range ember transport): embers traveling up to 100 m
+ Long-range spotting (or long-range ember transport): embers traveling up to 500 m

Because fuel patches in Edmonton are relatively small and primarily consist of narrow bands of deciduous forest in the North Saskatchewan River valley and ravine system, it was identified by City of Edmonton teams that fires are unlikely to become large enough to support long-range spotting to be a significant concern. Therefore, the exposure assessment focused only on potential ignition from radiant heat and short-range spotting.

Data Inputs and Treatment

The core inputs to the fireexposuR model come from landcover data that can be used to classify vegetation fuel type (i.e., the hazard). For Edmonton the best available source of data to allow for accurate landcover classification is the City's vegetation database called the "urban Primary Land and Vegetation Inventory" (uPLVI). This dataset provides polygon data that characterizes the vegetation within the City's Natural Area network and across the urban landscape. Vegetation classes from this dataset were reviewed by subject matter experts in wildfire behaviour and vegetation management to classify each landcover type as hazardous (represented by a 1) or non-hazardous (represented by a 0) for each of the fire ignition processes identified above. The fuel classifications used are shown in **Table A-1** below.

***Table A-1**. Land Cover Types and Fuel Classifications Based on the uPLVI Dataset*

Database Code	Label	Wildfire Fuel Hazard	30 m (Radiant Heat) Hazard Classification	100 m (Short-Range Ember) Hazard Classification
CLM	Coniferous Leading Mixedwood	Extreme	1	1
SW	White Spruce	Extreme	1	1
SB	Black Spruce	Extreme	1	1
CS	Closed Shrub	High	1	1
MS	Medial Shrub	High	1	1
OS	Open Shrub	High	1	1
NG	Non-Maintained Grass/Shrubs	High	1	1
HG	Herbaceous Grass	High	1	1
NZ	Naturalization	High	1	1
DLM	Deciduous Leading Mixedwood	Moderate	1	1
WT	Treed Bog	Moderate	1	1
AW	Trembling Aspen	Moderate	1	1
PB	Balsam Poplar	Moderate	1	1
MM	Manitoba Maple	Moderate	1	1
MD	Mixed Deciduous	Moderate	1	1
TS	Treed Shelterbelt	Moderate	1	1
TT	Transplant Trees	Moderate	1	1
CP	Tame Pasture	Moderate	1*	1*
CPR	Rough Pasture	Moderate	1*	1*
CA	Annual Crops	Moderate	1*	1*
NT	Nursery/Tree farm	Moderate	0	0
WS	Shrub Bog	Moderate	0	0
SF	Shrub Fen	Low	0	0
SW	Swamp	Low	0	0
TF	Treed Fen	Low	0	0
GF	Grass Fen	Low	0	0
M	Marsh	Low	0	0
EMS	Exposed Mineral Soil	NA	0	0
CL	Recent Clearing	NA	0	0
MG	Maintained Grass	NA	0	0
AF	Aggregates and/or Fill Site	NA	0	0
AIH	Transportation Surface	NA	0	0
AS	Acreage Subdivision	NA	0	0

Database Code	Label	Wildfire Fuel Hazard	30 m (Radiant Heat) Hazard Classification	100 m (Short-Range Ember) Hazard Classification
AW	Anthropogenic Water Body	NA	0	0
BPC	Building/Parking Complex	NA	0	0
CDS	Commercial/Industrial Development	NA	0	0
ECS	Established Commercial/Industrial	NA	0	0
ERC	Established Residential Community	NA	0	0
FS	Farmyard/Acreage	NA	0	0
HT	Agriculture Hygric Tillage	NA	0	0
MT	Maintained Trails	NA	0	0
NMS	Sand	NA	0	0
NW	Natural Water Body	NA	0	0
OG	Oil and/or Gas field	NA	0	0
RDS	Residential Development	NA	0	0

* denotes agricultural fuels that are only considered for seasonal exposure models in the spring and autumn (see Appendix D).

While the uPLVI dataset provides appropriate vegetation classification for the fireexposuR model, the resolution of the data is limited. The polygons provided in the uPLVI lack specificity to clearly delineate the boundary between wildland and urban areas (i.e., polygons are too large and often contain developed non-fuel areas within a polygon classified as natural forest cover). If not addressed, this issue would result in an overestimation of wildfire exposure by characterizing urban land cover as hazardous wildland fuels. To address this issue, the vegetation classification labels from the uPLVI were projected onto more accurate landcover polygons retrieved from Open Street Maps (OSM). OSM polygons were reviewed and identified to have better spatial resolutions and boundary accuracy for delineating wildland and urban/agricultural landcover types (i.e., OSM polygons closely match the real extent of wildland areas). However, OSM data lacks specificity in the delineation of different fuel hazards within wildland areas. To overcome these data limitations, the two data layers were combined by mapping the more detailed fuel hazard classification of the uPLVI onto the more detailed spatial boundaries of the OSM polygons. With the vegetation fuel types from the uPLVI properly assigned to the more accurate OSM polygons, the data were converted to a raster layer with 5-m resolution for processing in the fireexposuR model.

Data resolution could be further improved in the future through the updating of uPLVI data using automated processing of aerial imagery to more accurately delineate the boundaries of distinct land cover types. A current limitation with the uPLVI data is that it uses a minimum patch size of one hectare to classify land cover with little consideration for patch geometry, leading to mischaracterization of small

skinny patches. Future updates to the uPLVI should consider classifying land cover at as fine a resolution as possible before generalizing classifications at a one-hectare resolution if required. Improving the resolution of the uPLVI will improve the resolution and accuracy of the wildfire exposure model in the future by providing more detailed land cover input data.

Data Processing and Model Outputs

Using the fuel hazard input raster, each ignition process was analyzed using a circular moving window to assess the exposure for every grid cell over the city boundary plus a 200-m buffer. The radius of the window is equal to the maximum distance of each ignition process. The proportion of pixels within the window containing hazardous fuels estimates the exposure rating. The exposure is rated on a numerical value from 0-1 and then categorized on a scale from low to extreme in alignment with the NRC's national Guide on WUI Fires. The exposure scale used are as follows:

+ Exposure < 0.05 = not exposed
+ Exposure 0.05-0.1 = Low
+ Exposure 0.1-0.25 = Moderate
+ Exposure 0.25-0.45 = High
+ Exposure > 0.45 = Extreme

The output of the fireexposuR model shows one raster layer for each ignition process, identifying areas within range to be impacted by hazardous fuels. These maps can then be overlaid with other asset and demographic data to provide a better understanding of vulnerability and risk across the city. These mapping overlays are described further in the following section.

Wildfire Risk Mapping

Wildfire risk mapping considers characteristics of the built environment and population data that may affect the outcomes of a wildfire. For example, two areas with the same wildfire exposure may have different types of assets and/or more vulnerable populations, making one area at a comparatively higher wildfire risk than the other. Wildfire risk mapping can inform wildfire mitigation and adaptation strategies by identifying areas of relatively high exposure to prioritize areas for action and identifying the characteristics of the built environment and population to inform types of actions and considerations for implementation.

As this is a broad-scale assessment of wildfire risk over the entire City of Edmonton, it was necessary to make generalizations about the community characteristics that may impact structure susceptibility and resident vulnerability to wildfire. To do this, vulnerability indicators were selected from census data and aggregated by dissemination area. Vulnerability data has been presented as individual layers to support a visual exploration of different equity and socioeconomic factors that may impact residents' ability to prepare for, respond to, and recover from a wildfire in their neighbourhood. A list of vulnerability indicators is provided below with more description of the intended use of each indicator presented in **Section 4.3**.

- Structure density: An indicator of the vulnerability of a fire spreading through the built environment
- Dwelling density: An indicator of the vulnerability of a fire spreading through structures used as dwellings
- Median household income: An indicator of social vulnerability
- Median property value: An indicator of infrastructure costs and the potential financial impact of wildfire damage, should a wildfire occur
- Median age: An indicator of social vulnerability
- Population racialization: an indicator of social vulnerability
  - Percent of population noted as Indigenous
  - Percent of population noted as a visible minority

In addition to this census data, vulnerability was also assessed by looking at structures directly exposed to hazardous fuels and by assessing structure density in dissemination areas exposed to hazardous fuels. Structure data was extracted from the OSM dataset, which contains polygons for all buildings interpreted from aerial imagery. This structure layer was then clipped to show all structures intersecting the fire exposure layers. Maps outlining structure exposure to short-range ember transport are provided in Appendix C, along with exposure to valued municipal assets, a data layer provided by the City of Edmonton. Structure data was also aggregated by census dissemination area to show structure density (structures/km^2), which is presented along with the other risk maps in **Section 4.4.**

A.4 Climate Change Projections

Projections of future climate change play a fundamental role in improving the understanding of the climate system as well as characterizing societal risks and mitigation response options. Climate projections provide an estimation of how future climate conditions are likely to change based on known observations of historical weather patterns and predicted future trends in greenhouse gas (GHG) emissions and human development.

As there is no single definitive Global Climate Model (GCM) design and/or configuration, it is necessary to consider a group of GCM projections, called an ensemble, when completing assessments. All climate models carry uncertainties in projected future greenhouse gas (GHG) emissions and in how the models simulate natural climate variability. Climate models also consist of mathematical representations of the real climate system that use well-established physical principles to simulate the climate; however, each model uses slightly different approaches, which produce inter-model differences. This means each model has different strengths and weaknesses. For example, the use of different spatial scales, which affects how well they represent topography or variation in model parameters, can be either a strength or weakness. Statistical analyses of an ensemble of projections allows the presentation of a range of anticipated results. It is therefore best practice in climate research and analysis to consider the statistics across the ensemble of projections, most often represented by selected percentiles.

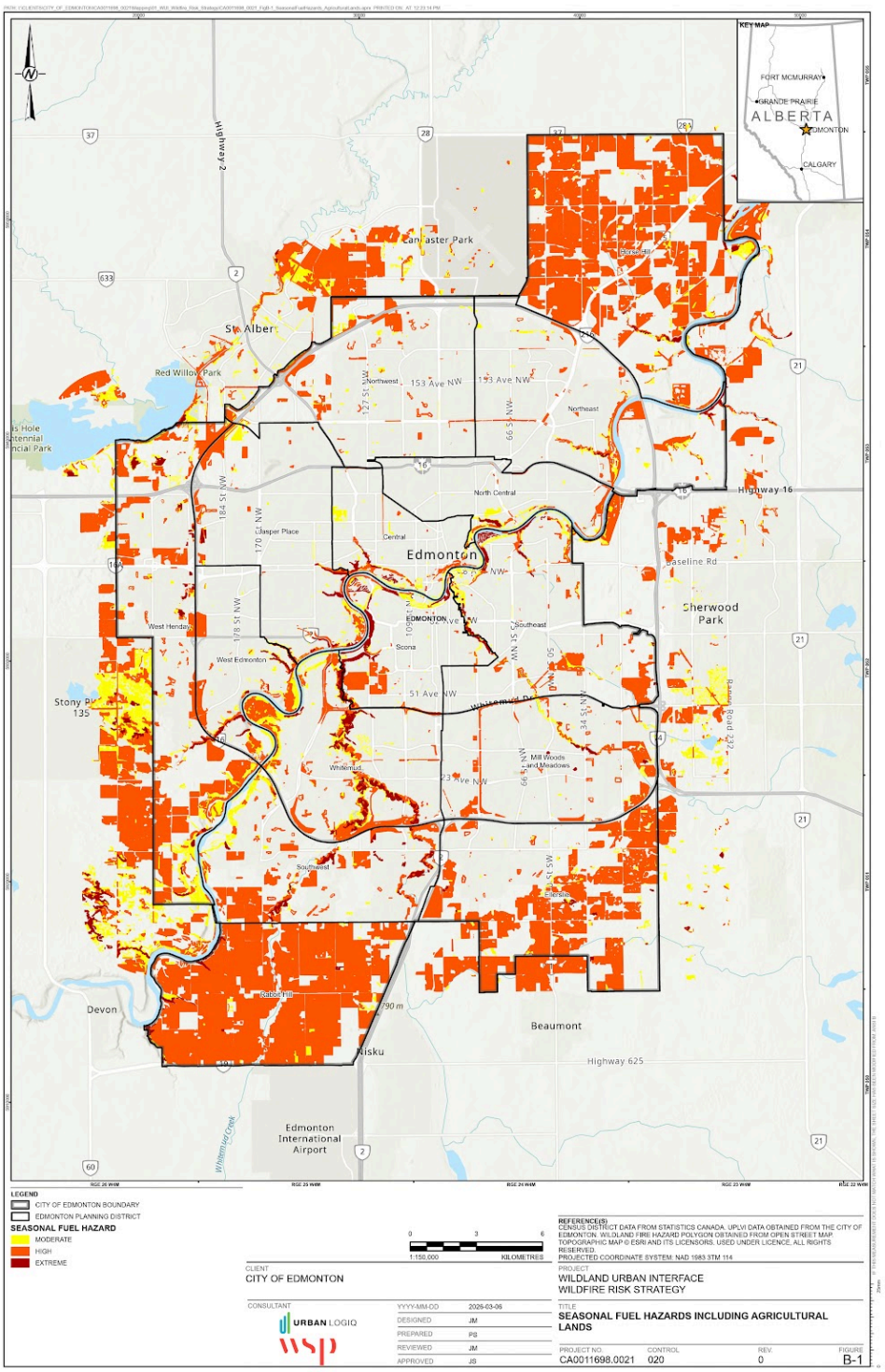
The 2021 Intergovernmental Panel on Climate Change's (IPCC's) 6th Assessment Report (AR6) features new Coupled Model Intercomparison Project (CMIP) 6 models. Improvements from the last intercomparison project include an increased number

of modeling groups participating, the number of future scenarios examined, and the number of different experiments conducted, as well as a new baseline starting from 2015 (rather than 2006 previously) [25]. The energy modeling community has developed a new set of emissions scenarios driven by different socioeconomic assumptions, called the Shared Socioeconomic Pathways (SSPs). These updated scenarios are called SSP1-2.6 (low end of the change spectrum), SSP2-4.5 (intermediate end of the spectrum), SSP4-6.0 (intermediate to high end of the change spectrum), and SSP5-8.5 (high end of the change spectrum), where the number after the hyphen represents the level of radiative forcing by 2100 (e.g., SSP5-8.5 will achieve 8.5 W/m^2 of radiative forcing by 2100) [26].

Projections were extracted for the City of Edmonton (53.5417N; 113.4583W) for the SSP5-8.5 scenario. This is a high-emission scenario that assumes little is done to reduce global GHG emissions, with global development following a business-as-usual development pathway with sustained and expanded use of fossil fuels. This scenario results in more dramatic climate change, representing a worst-case scenario for more conservative and robust adaptation planning. As climate varies naturally over many different timescales, from season to season, year to year, and decade to decade, thirty-year time horizons are often used to smooth out the short-term variations and natural climate variability [27]. For this assessment, ten 30-year periods were assessed starting from 1991 and ending in 2100 centered on the midpoint for each 30-year range (e.g., the 2050s represents the period from 2041 to 2070).

Climate projections were assessed for a suite of climate indicators that can inform potential changes in wildfire activity in the future. Indicators assessed cover a range of temperature, precipitation, and drought parameters that can influence fuel moisture, and wildfire intensity. Refer to **Section 4.4** for a list of all climate indicators assessed and a summary of key trends.

Appendix B: Seasonal Exposure to Wildfire Including Agricultural Fuel Hazard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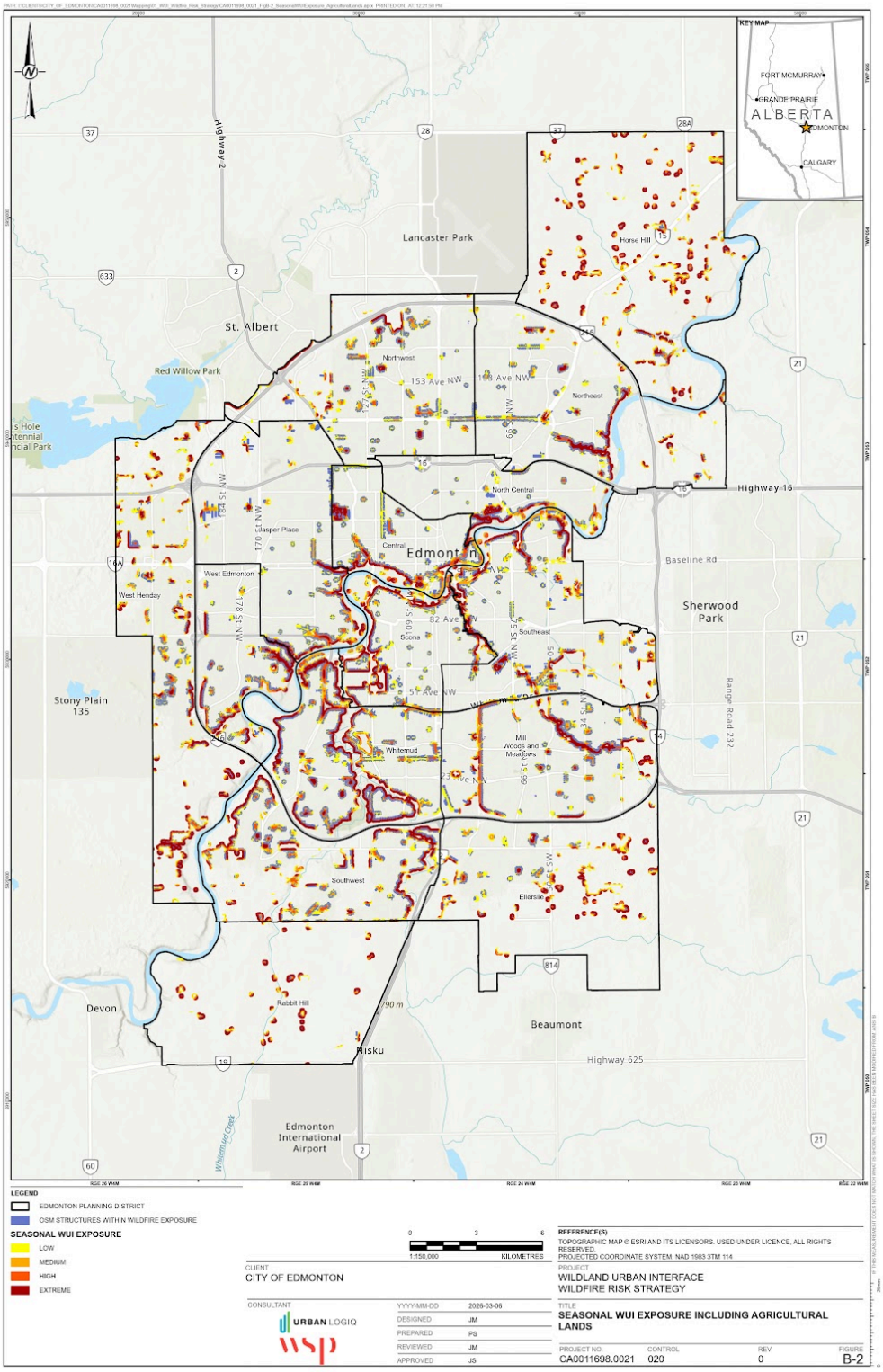
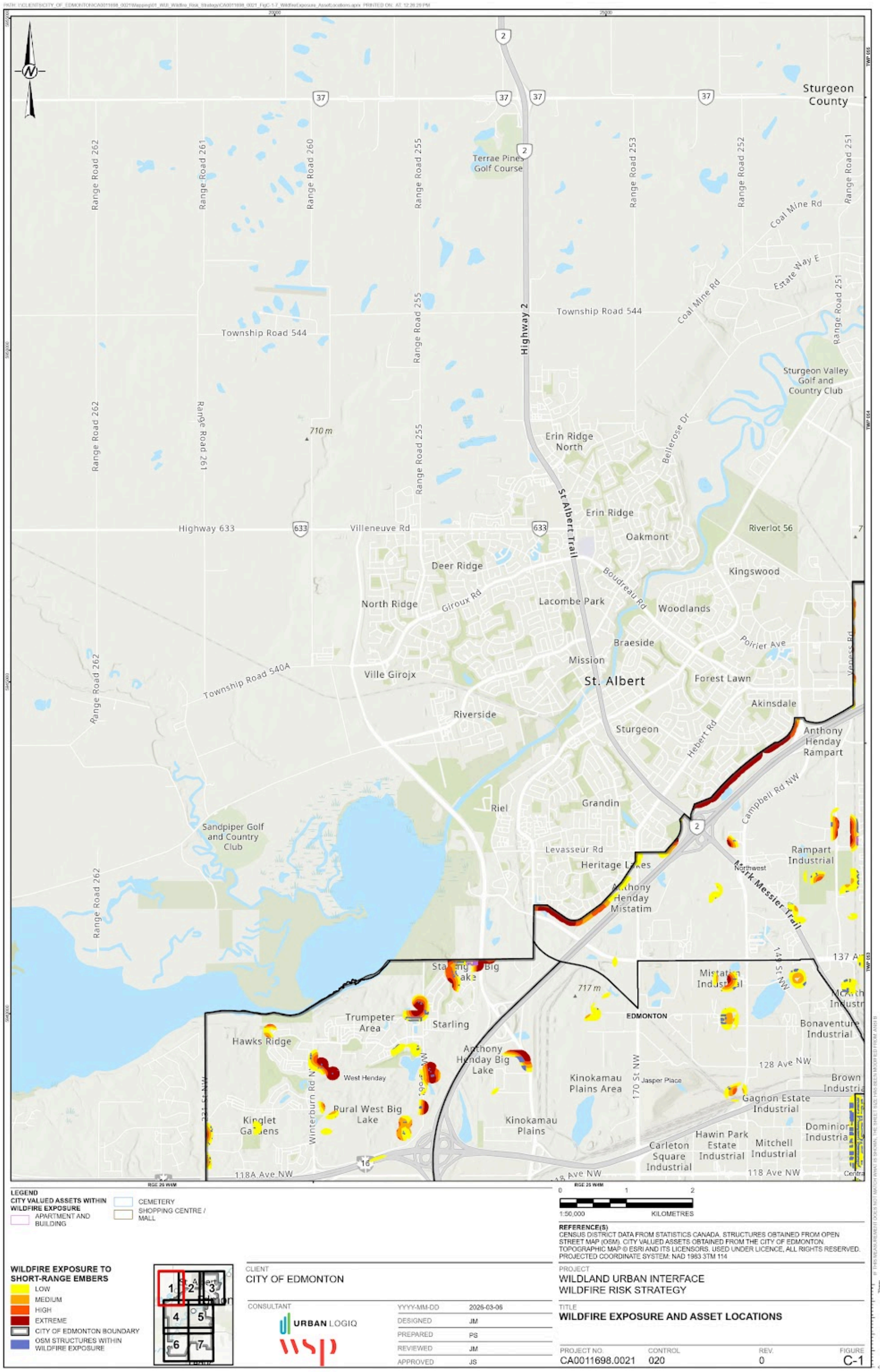
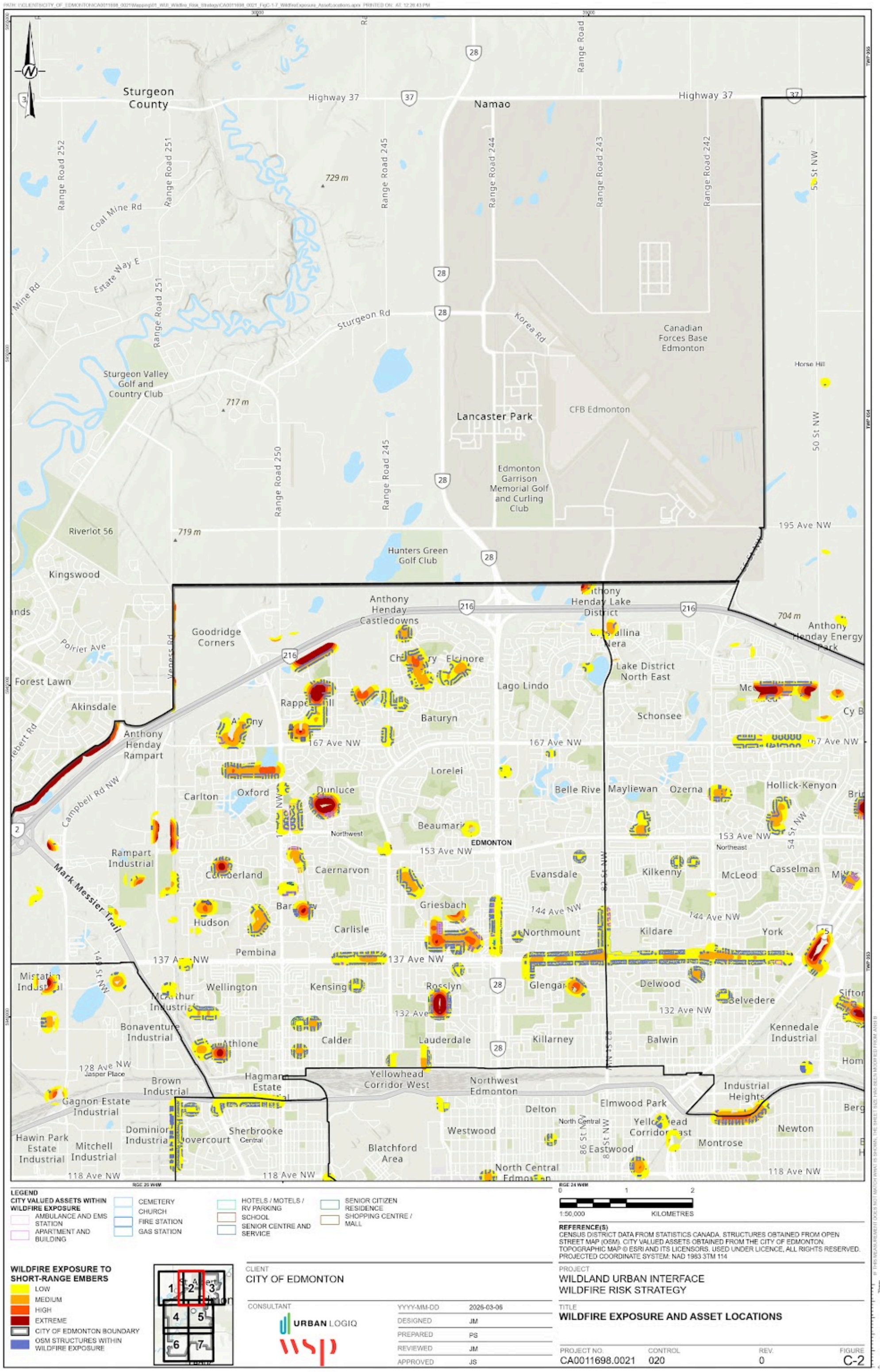
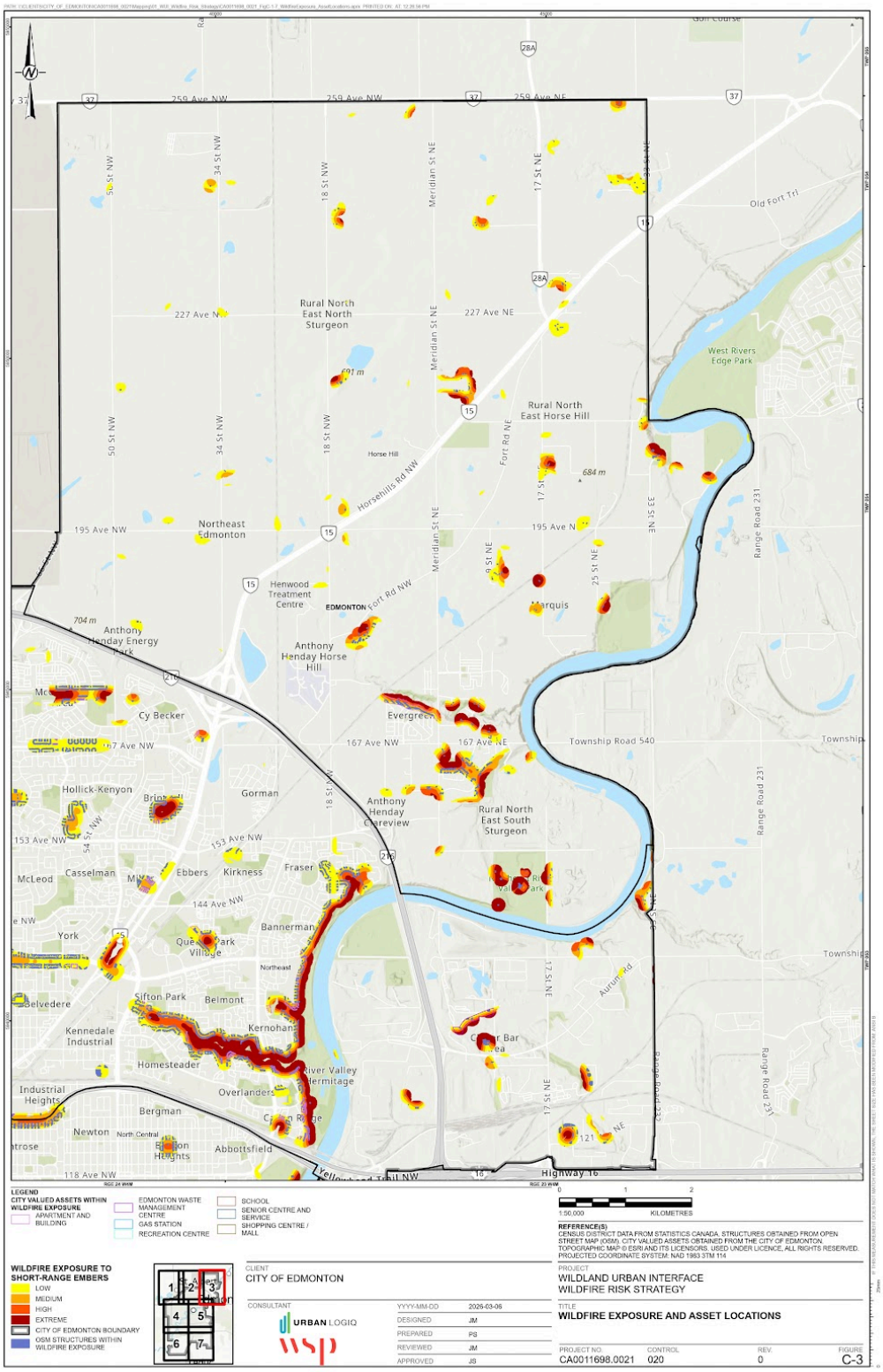
FORT MCMURRAY
GRANDE PRAIRIE
ALBERTA
EDMONTON
CALGARY
Edmonton
St. Albert
Sherwood Park
Beaumont
Devon
Stony Plain
Spruce Grove
Leduc
Fort Saskatchewan
Highway 2
Highway 16
Highway 625
Edmonton International Airport
Whitemud Creek
LEGEND
CITY OF EDMONTON BOUNDARY
EDMONTON PLANNING DISTRICT
SEASONAL FUEL HAZARD
MODERATE
HIGH
EXTREME
1:150,000
KILOMETRES
CLIENT
CITY OF EDMONTON
CONSULTANT
URBAN LOGIQ
PROJECT
WILDLAND URBAN INTERFACE
WILDFIRE RISK STRATEGY
TITLE
SEASONAL FUEL HAZARDS INCLUDING AGRICULTURAL LANDS
PROJECT NO.
CA0011698.0021
CONTROL
020
REV.
0
FIGURE
B-1


KEY MAP
FORT MCMURRAY
GRANDE PRAIRIE
ALBERTA
EDMONTON
CALGARY
Lancaster Park
Horse Hill
St. Albert
Red Willow Park
Northwest
Northeast
North Central
Central
Edmonton
West Edmonton
West Henday
Jasper Place
Highway 16
Baseline Rd
Sherwood Park
Sconna
Southeast
Stony Plain
135
Whitemud
Mill Woods and Meadows
Range Road 232
Southwest
Ellerslie
Devon
Rabbit Hill
790 m
Beaumont
Nisku
Highway 625
Edmonton International Airport
Whitemud Creek
LEGEND
EDMONTON PLANNING DISTRICT
GSM STRUCTURES WITHIN WILDFIRE EXPOSURE
SEASONAL WUI EXPOSURE
LOW
MEDIUM
HIGH
EXTREME
1:150,000
KILOMETRES
REFERENCE(S)
TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE, ALL RIGHTS RESERVED.
PROJECTED COORDINATE SYSTEM: NAD 1983 STM 114
CLIENT
CITY OF EDMONTON
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
CONSULTANT
URBAN LOGIQ
wsp
YYYY-MM-DD 2026-03-06
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
TITLE
SEASONAL WUI EXPOSURE INCLUDING AGRICULTURAL LANDS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE B-2

Appendix C: Structure and Valued Asset Exposure to Wildfire


Sturgeon County
Terrae Pines Golf Course
Highway 2
Township Road 544
Range Road 262
Range Road 261
Range Road 260
Range Road 255
Range Road 253
Range Road 252
Range Road 251
Coal Mine Rd
Estate Way E
Sturgeon Valley Golf and Country Club
Erin Ridge North
Erin Ridge
Oakmont
Highway 633
Villeneuve Rd
St Albert Trail
Riverlot 56
Kingswood
Deer Ridge
North Ridge
Giroux Rd
Lacombe Park
Woodlands
Boudreau Rd
Braeside
Poirier Ave
Township Road 540A
Ville Giroux
Mission
St. Albert
Forest Lawn
Akinsdale
Riverside
Sturgeon
Anthony Henday Rampart
Grandin
Riel
Campbell Rd NW
Sandpiper Golf and Country Club
Levasseur Rd
Heritage Lakes
Rampart Industrial
Anthony Henday Mistatim
Mark Messier Trail
Starling
Trumpeter Area
Hawks Ridge
West Henday
Anthony Henday Big Lake
EDMONTON
Mistatim Industrial
Bonaventure Industrial
128 Ave NW
Kinokamau Plains Area
Jasper Place
170 St NW
Rural West Big Lake
Kinglet Gardens
Winterburn Rd NW
Kinokamau Plains
Gagnon Estate Industrial
Dominion Industrial
Hawin Park Estate Industrial
Mitchell Industrial
Carleton Square Industrial
118A Ave NW
118 Ave NW
LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
APARTMENT AND BUILDING
CEMETERY
SHOPPING CENTRE / MALL
WILDFIRE EXPOSURE TO SHORT-RANGE EMBERS
LOW
MEDIUM
HIGH
EXTREME
CITY OF EDMONTON BOUNDARY
OSM STRUCTURES WITHIN WILDFIRE EXPOSURE
1:50,000
KILOMETRES
REFERENCE(S)
CENSUS DISTRICT DATA FROM STATISTICS CANADA. STRUCTURES OBTAINED FROM OPEN STREET MAP (OSM). CITY VALUED ASSETS OBTAINED FROM THE CITY OF EDMONTON. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 3TM 114
CLIENT
CITY OF EDMONTON
CONSULTANT
URBAN LOGIQ
YYYY-MM-DD 2026-03-06
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
TITLE
WILDFIRE EXPOSURE AND ASSET LOCATIONS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE C-1


LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
AMBULANCE AND EMS STATION
APARTMENT AND BUILDING
CEMETERY
CHURCH
FIRE STATION
GAS STATION
HOTELS / MOTELS / RV PARKING
SCHOOL
SENIOR CENTRE AND SERVICE
SENIOR CITIZEN RESIDENCE
SHOPPING CENTRE / MALL
WILDFIRE EXPOSURE TO SHORT-RANGE EMBERS
LOW
MEDIUM
HIGH
EXTREME
CITY OF EDMONTON BOUNDARY
OSM STRUCTURES WITHIN WILDFIRE EXPOSURE
1:50,000
KILOMETRES
REFERENCE(S)
CENSUS DISTRICT DATA FROM STATISTICS CANADA. STRUCTURES OBTAINED FROM OPEN STREET MAP (OSM). CITY VALUED ASSETS OBTAINED FROM THE CITY OF EDMONTON. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 3TM 114
CLIENT
CITY OF EDMONTON
CONSULTANT
URBAN LOGIQ
YYYY-MM-DD 2026-03-06
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
TITLE
WILDFIRE EXPOSURE AND ASSET LOCATIONS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE C-2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259 Ave NE
227 Ave NW
227 Ave NE
195 Ave NW
195 Ave NE
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167 Ave NE
153 Ave NW
144 Ave NW
118 Ave NW
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34 St NW
18 St NW
Meridian St NE
17 St NE
33 St NE
25 St NE
9 St NE
Fort Rd NE
Horsehills Rd NW
Old Fort Trl
Range Road 231
Township Road 540
Rural North East North Sturgeon
Rural North East Horse Hill
Rural North East South Sturgeon
Northeast Edmonton
Henwood Treatment Centre
Anthony Henday Energy Park
Anthony Henday Horse Hill
Anthony Henday Clareview
West Rivers Edge Park
Horse Hill
691 m
684 m
704 m
Cy Becker
Hollick-Kenyon
Gorman
Casselman
Ebbers
Kirkness
Fraser
McLeod
York
Bannerman
Belvedere
Sifton Park
Belmont
Kennedale Industrial
Kernohan
Homesteader
River Valley
Overlanders
Industrial Heights
Bergman
Newton
Abbottsfield
Autumnwood
Highway 16
LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
APARTMENT AND BUILDING
EDMONTON WASTE MANAGEMENT CENTRE
GAS STATION
RECREATION CENTRE
SCHOOL
SENIOR CENTRE AND SERVICE
SHOPPING CENTRE / MALL
WILDFIRE EXPOSURE TO SHORT-RANGE EMBERS
LOW
MEDIUM
HIGH
EXTREME
CITY OF EDMONTON BOUNDARY
OSM STRUCTURES WITHIN WILDFIRE EXPOSURE
1:50,000
KILOMETRES
REFERENCE(S)
CENSUS DISTRICT DATA FROM STATISTICS CANADA. STRUCTURES OBTAINED FROM OPEN STREET MAP (OSM). CITY VALUED ASSETS OBTAINED FROM THE CITY OF EDMONTON. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE. ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 3TM 114
CLIENT
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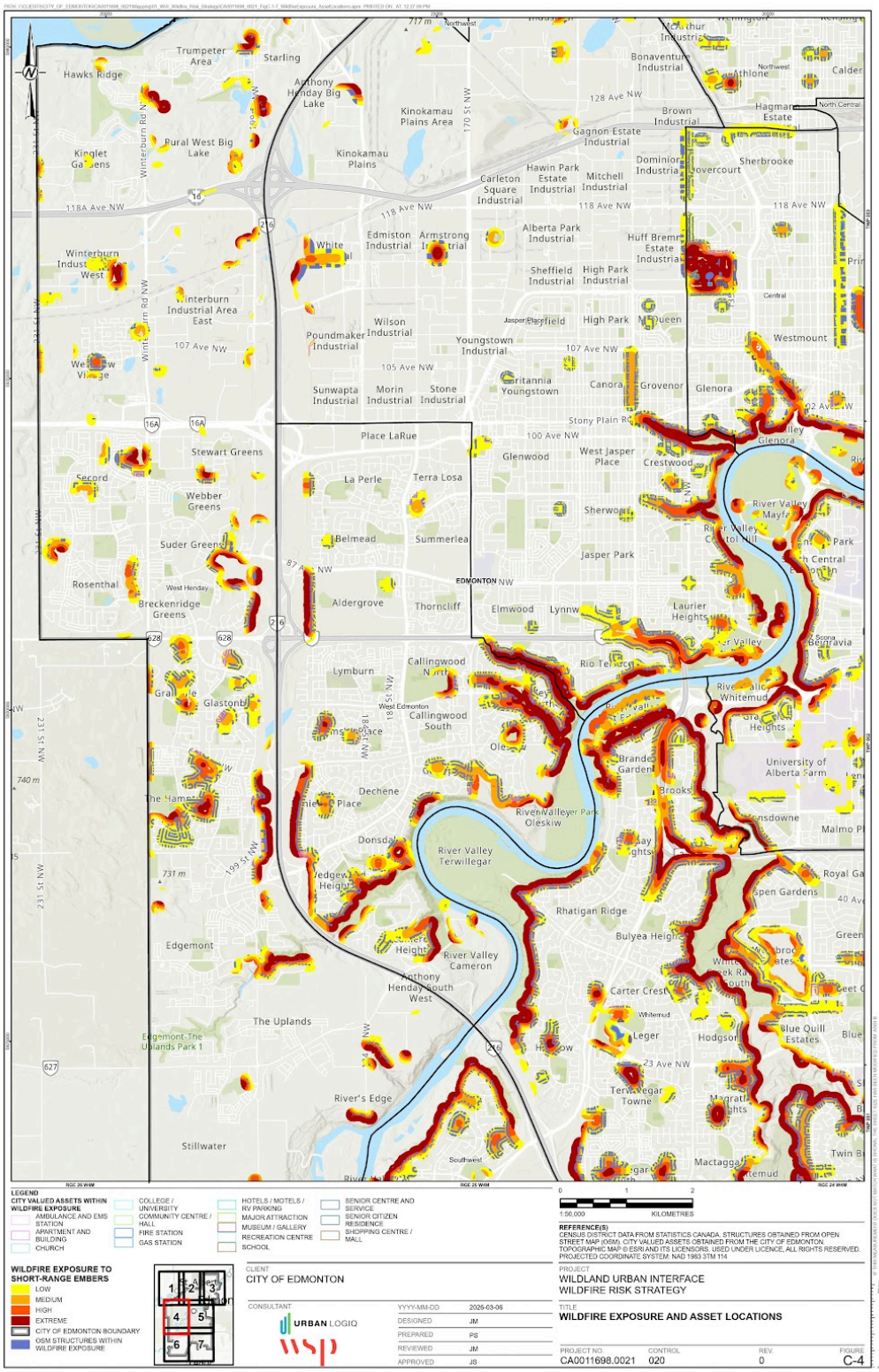
CONSULTANT
URBAN LOGIQ
WSP
YYYY-MM-DD 2026-03-06
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
TITLE
WILDFIRE EXPOSURE AND ASSET LOCATIONS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE C-3


Trumpeter Area
Starling
Hawks Ridge
Anthony Henday Big Lake
Kinokamau Plains Area
Rural West Big Lake
Kinokamau Plains
Winterburn Rd NW
170 St NW
128 Ave NW
Gagnon Estate Industrial
Brown Industrial
Hagman Estate
Kinglet Gardens
Carleton Square Industrial
Hawin Park Estate Industrial
Mitchell Industrial
Dominion Industrial
Sherbrooke
Covercourt
118A Ave NW
118 Ave NW
Alberta Park Industrial
Huff Bremner Estate Industrial
Winterburn Industrial West
White
Edmiston Industrial
Armstrong Industrial
Sheffield Industrial
High Park Industrial
Winterburn Industrial Area East
Poundmaker Industrial
Wilson Industrial
Youngstown Industrial
High Park
Westmount
107 Ave NW
105 Ave NW
Sunwapta Industrial
Morin Industrial
Stone Industrial
Britannia Youngstown
Canora
Grovenor
Glenora
Stony Plain Rd
100 Ave NW
Place LaRue
Stewart Greens
Glenwood
West Jasper Place
Crestwood
Secord
La Perle
Terra Losa
Webber Greens
Sherwood
River Valley Mayfair
Belmead
Summerlea
Suder Greens
Jasper Park
Rosenthal
West Henday
Breckenridge Greens
Aldergrove
Thorncliff
Elmwood
Lynnwood
Laurier Heights
Lymburn
Callingwood North
Callingwood South
West Edmonton
Glastonbury
Oleskiw
University of Alberta Farm
Brander Gardens
Brookside
Dechene
The Hamlets
River Valley Oleskiw
Donsdale
River Valley Terwillegar
Wedgewood Heights
Rhatigan Ridge
Bulyea Heights
Edgemont
River Valley Cameron
Anthony Henday South West
Carter Crest
The Uplands
Edgemont The Uplands Park 1
Leger
Blue Quill Estates
River's Edge
Terwillegar Towne
Stillwater
Mactaggart
Twin Brooks
LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
AMBULANCE AND EMS STATION
APARTMENT AND BUILDING
CHURCH
COLLEGE / UNIVERSITY
COMMUNITY CENTRE / HALL
FIRE STATION
GAS STATION
HOTELS / MOTELS / RV PARKING
MAJOR ATTRACTION
MUSEUM / GALLERY
RECREATION CENTRE
SCHOOL
SENIOR CENTRE AND SERVICE
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KILOMETRES
REFERENCE(S)
CENSUS DISTRICT DATA FROM STATISTICS CANADA. STRUCTURES OBTAINED FROM OPEN STREET MAP (OSM). CITY VALUED ASSETS OBTAINED FROM THE CITY OF EDMONTON. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE. ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 3TM 114
CLIENT
CITY OF EDMONTON
CONSULTANT
URBAN LOGIQ
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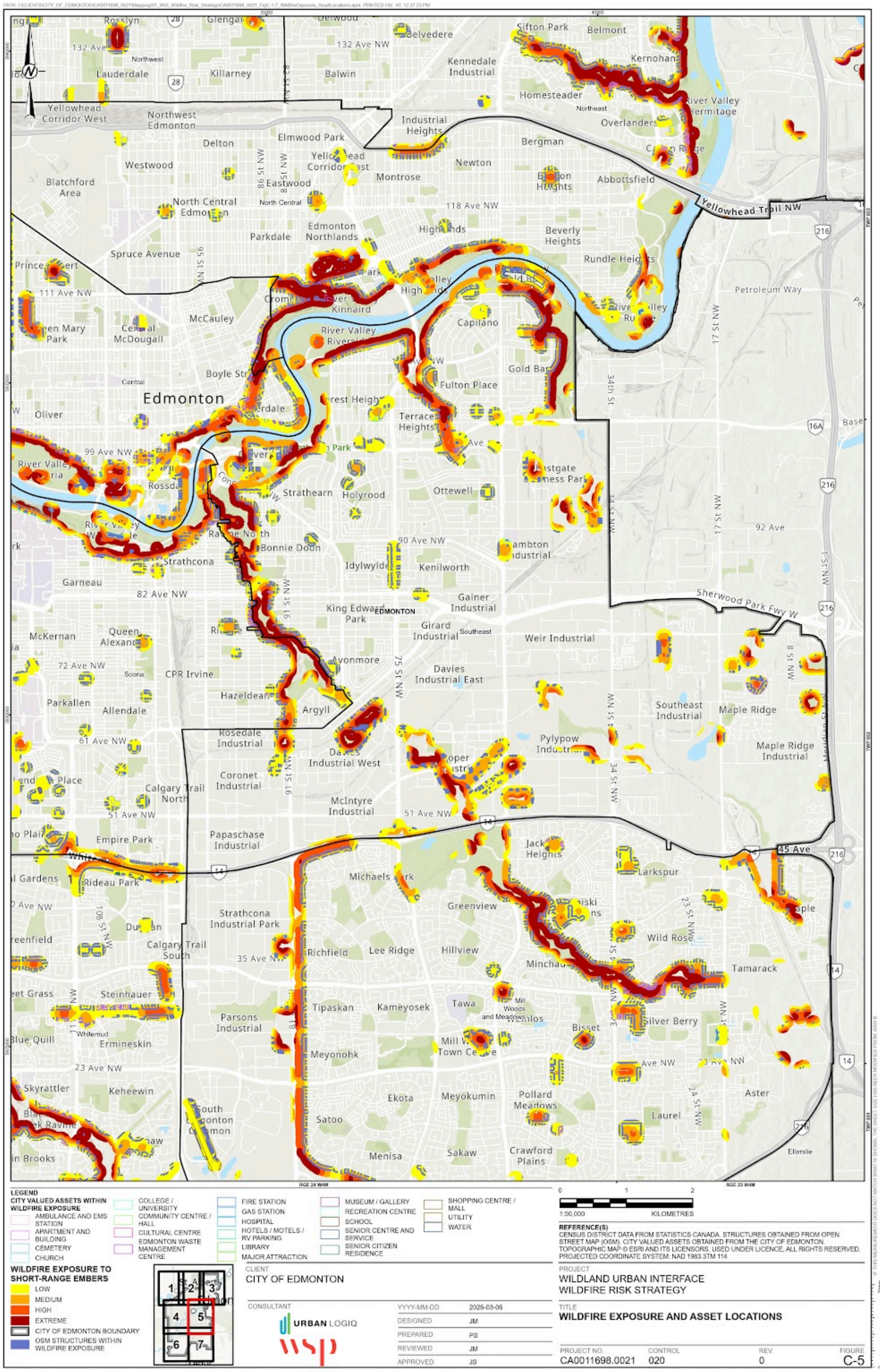
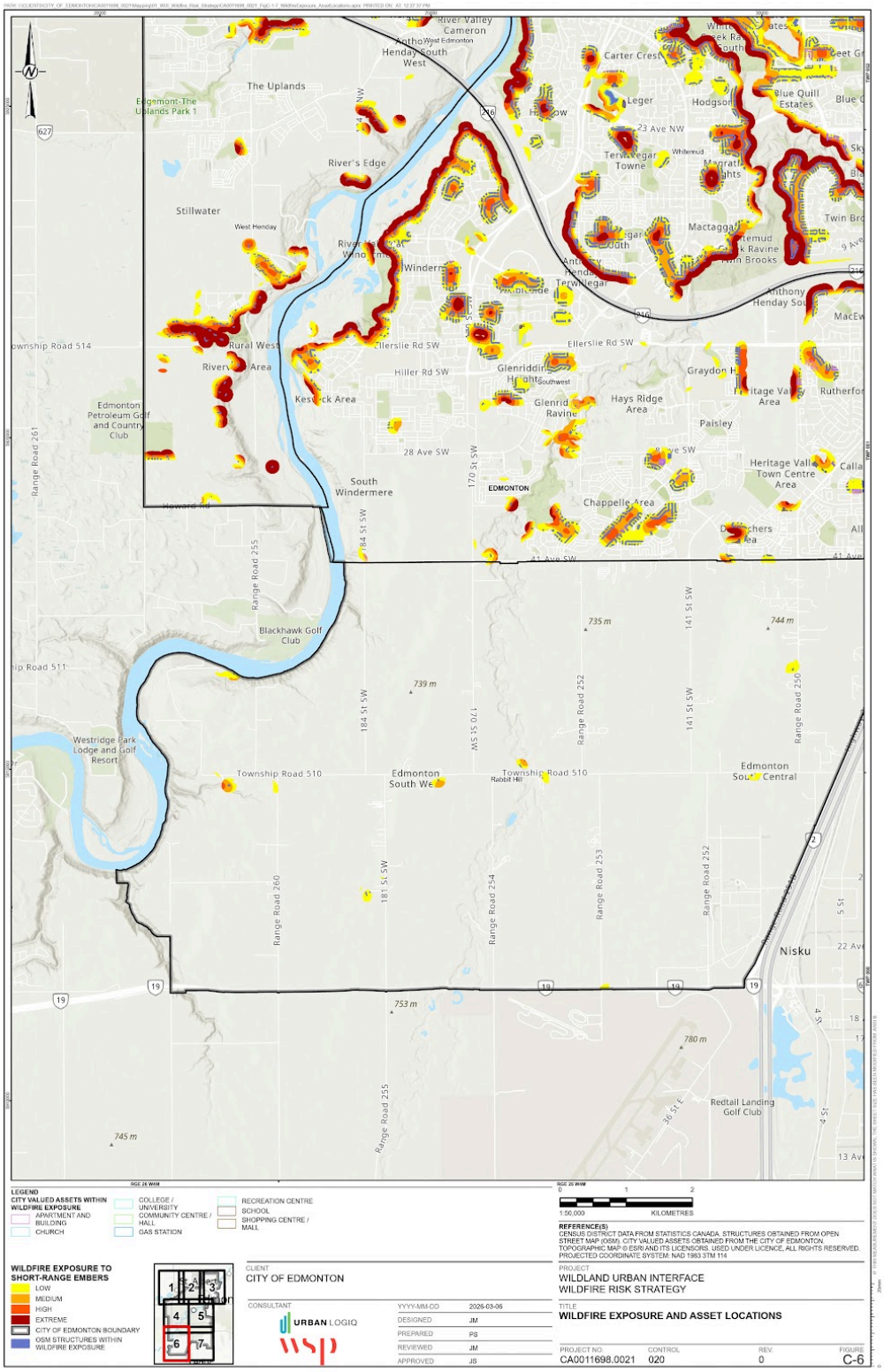
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
TITLE
WILDFIRE EXPOSURE AND ASSET LOCATIONS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE C-4


LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
AMBULANCE AND EMS STATION
APARTMENT AND BUILDING
CEMETERY
CHURCH
COLLEGE / UNIVERSITY
COMMUNITY CENTRE / HALL
CULTURAL CENTRE
EDMONTON WASTE MANAGEMENT CENTRE
FIRE STATION
GAS STATION
HOSPITAL
HOTELS / MOTELS / RV PARKING
LIBRARY
MAJOR ATTRACTION
MUSEUM / GALLERY
RECREATION CENTRE
SCHOOL
SENIOR CENTRE AND SERVICE
SENIOR CITIZEN RESIDENCE
SHOPPING CENTRE / MALL
UTILITY
WATER
WILDFIRE EXPOSURE TO SHORT-RANGE EMBERS
LOW
MEDIUM
HIGH
EXTREME
CITY OF EDMONTON BOUNDARY
OSM STRUCTURES WITHIN WILDFIRE EXPOSURE
0 1 2
1:50,000 KILOMETRES
REFERENCE(S)
CENSUS DISTRICT DATA FROM STATISTICS CANADA. STRUCTURES OBTAINED FROM OPEN STREET MAP (OSM). CITY VALUED ASSETS OBTAINED FROM THE CITY OF EDMONTON. TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENCE, ALL RIGHTS RESERVED. PROJECTED COORDINATE SYSTEM: NAD 1983 3TM 114
CLIENT
CITY OF EDMONTON
CONSULTANT
URBAN LOGIQ
wsp
YYYY-MM-DD 2026-03-06
DESIGNED JM
PREPARED PS
REVIEWED JM
APPROVED JS
PROJECT
WILDLAND URBAN INTERFACE WILDFIRE RISK STRATEGY
TITLE
WILDFIRE EXPOSURE AND ASSET LOCATIONS
PROJECT NO. CA0011698.0021
CONTROL 020
REV. 0
FIGURE C-5


LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
APARTMENT AND BUILDING
CHURCH
COLLEGE / UNIVERSITY
COMMUNITY CENTRE / HALL
GAS STATION
RECREATION CENTRE
SCHOOL
SHOPPING CENTRE / MALL
WILDFIRE EXPOSURE TO SHORT-RANGE EMBERS
LOW
MEDIUM
HIGH
EXTREME
CITY OF EDMONTON BOUNDARY
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1:50,000
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FIGURE C-6
The Uplands
Edgemont-The Uplands Park 1
River's Edge
Stillwater
West Henday
Rural West
Edmonton Petroleum Golf and Country Club
Keswick Area
South Windermere
EDMONTON
Glenridding Heights
Glenridding Ravine
Hays Ridge Area
Paisley
Chappelle Area
Heritage Valley Town Centre Area
Blackhawk Golf Club
Westridge Park Lodge and Golf Resort
Township Road 510
Edmonton South West
Edmonton South Central
Nisku
Redtail Landing Golf Club
Range Road 261
Range Road 255
Range Road 260
Range Road 254
Range Road 253
Range Road 252
Range Road 250
184 St SW
170 St SW
181 St SW
141 St SW
Ellerslie Rd SW
Hiller Rd SW
28 Ave SW
41 Ave SW
23 Ave NW
735 m
744 m
739 m
753 m
780 m
745 m

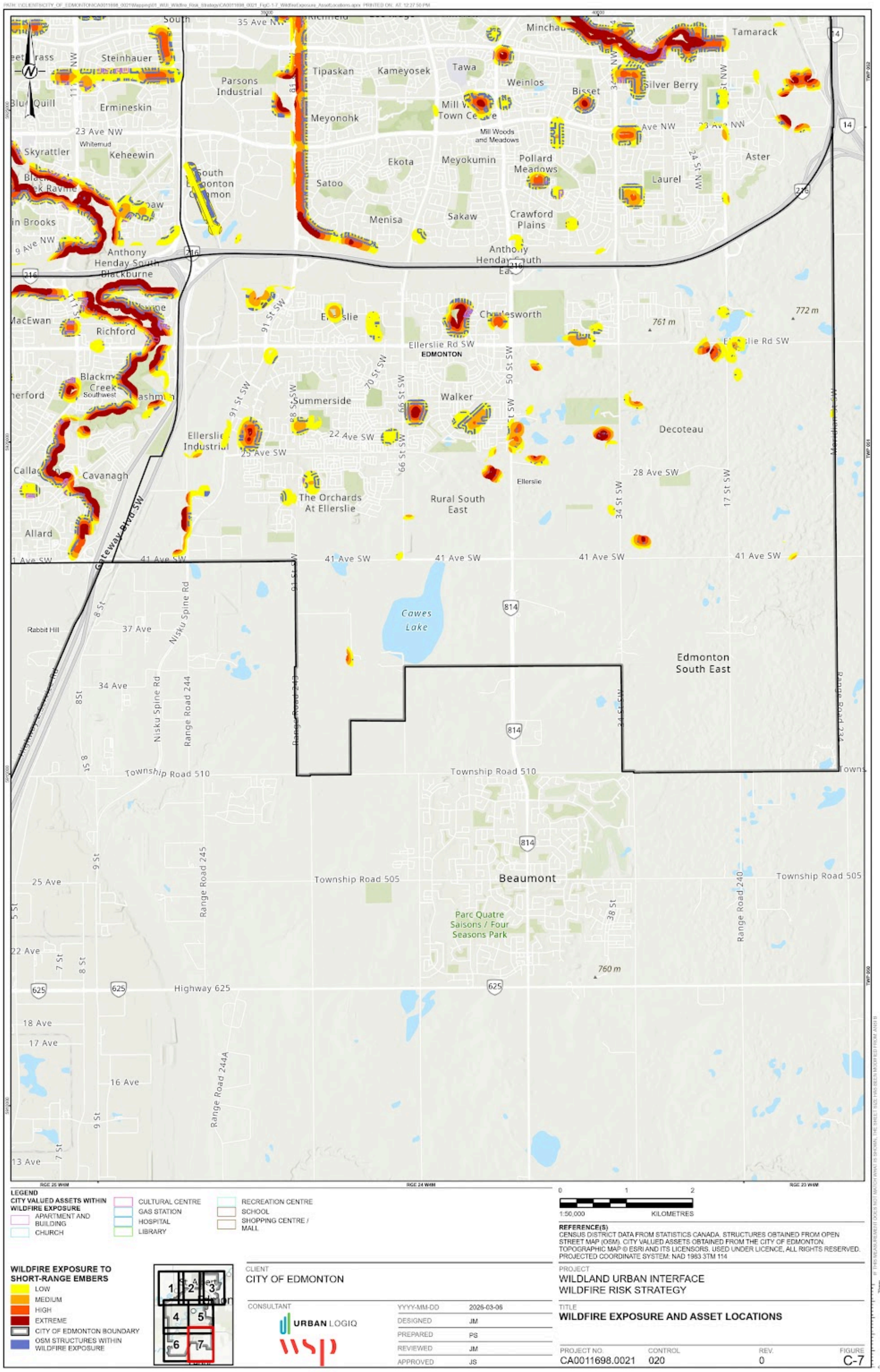
Tamarack
Minchau
Steinhauer
Parsons Industrial
Tipaskan
Kameyosek
Tawa
Weinlos
Bisset
Silver Berry
Ermineskin
Meyonohk
Mill Woods Town Centre
Mill Woods and Meadows
Skyrattler
Keheewin
Ekota
Meyokumin
Pollard Meadows
Laurel
Aster
Satoo
Menisa
Sakaw
Crawford Plains
Anthony Henday South
Blackburne
MacEwan
Richford
Ellerslie
Chappelle
Charlesworth
Ellerslie Rd SW
EDMONTON
Summerside
Walker
Decoteau
Ellerslie Industrial
The Orchards At Ellerslie
Rural South East
Cavanagh
Allard
41 Ave SW
Cawes Lake
Edmonton South East
Township Road 510
Beaumont
Township Road 505
Parc Quatre Saisons / Four Seasons Park
Highway 625
LEGEND
CITY VALUED ASSETS WITHIN WILDFIRE EXPOSURE
APARTMENT AND BUILDING
CHURCH
CULTURAL CENTRE
GAS STATION
HOSPITAL
LIBRARY
RECREATION CENTRE
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FIGURE C-7

Appendix D: Vegetation Management Methods Based on Land Management and Fuel Type

Fuel Type	Fuel Reduction	Fuel Removal	Fuel Conversion
Coniferous and Coniferous-Leading Mixedwood	+ Prune limbs within 2 m of the ground, thin stems to have 3 m spacing. + Remove excess woody debris from the forest floor to avoid the build-up of flammable coniferous detritus along trails/pathways and in areas close to development neighbourhoods. + Scatter fuel to support a low-intensity prescribed surface fire to simulate natural fire cycles. + Avoid the use of bark mulch, avoid build-up of flammable coniferous detritus. + Consider prescribed burns where safe and appropriate, and where it follows natural succession. + Provide irrigation where feasible.	+ In high-risk areas, consider clearing a strip of vegetation adjacent to the built-up area.	+ In disturbed areas that are being naturalized, consider planting/promoting the growth of deciduous, fire-resistant species. + Use fire-resistant species in landscaping adjacent to trails or facilities. + Convert coniferous ornamental trees in parks to fire-resistant, deciduous species (birch, aspen, poplar, cottonwood, willow, mountain ash, maple, alder, cherry). This could be done proactively or as trees need to be replaced.
Deciduous-Leading Mixedwood and Deciduous Stands	+ Reduce the amount of fine and medium surface fuels, space out heavy fuels, and verify full contact with the ground to promote moisture uptake and decomposition. + Scatter fuel to support a low-intensity prescribed surface fire to simulate natural fire cycles.	+ In high-risk areas, consider clearing a strip of vegetation adjacent to the built-up area.	+ Encourage natural seeding and suckering of deciduous species and favour deciduous saplings when treating these stands. Natural succession will lean towards more coniferous volume; therefore, some seeding and suckering may be needed to maintain a Mixedwood balance.
Grassland and Shrubland	+ Maintain grass and low shrubs during the fire season through mowing, prescribed burns, or grazing. + Time mowing throughout the dry season and in fall prior to snowfall to minimize accumulated fuel in spring. + In tall, closed shrub stands, prune lower branches within 2 m of the ground and remove surface fuels. + Scatter fuel to support a low-intensity prescribed surface fire to simulate natural fire cycles. + Remove tall, dead/dying shrubs.	+ In high-risk areas, consider clearing a strip of vegetation adjacent to the built-up area, particularly dense shrubs (e.g., caragana).	+ Use fire-resistant species in landscaping adjacent to trails or facilities. + Convert planted coniferous shrubs (e.g., dwarf mugo pine) to fire-resistant deciduous species (e.g., Red-osier dogwood, cranberry, willow, rose). + Consider fire-resistant natural species with low resin content (e.g., yarrow, bunchberry, rocky mountain fescue, blue grama grass) in landscaping.

Fuel Type	Fuel Reduction	Fuel Removal	Fuel Conversion
Pasture and Crop	+ Encourage property owners within the WUI to reduce combustible fuels around their properties. This could include removing fuels along roads, which are a common source of ignition. Encourage property owners to irrigate to minimize risk.	+ Encourage property owners within the WUI to remove combustible fuels around their properties, particularly within 1.5 m of all buildings and around ignition sources (e.g., roads, shops, equipment).	+ Encourage property owners within the WUI to replace hazardous vegetation on their property (e.g., coniferous shelterbelts) with fire-resistant vegetation as vegetation declines/dies.
Landscaping on Private Property	+ Encourage property owners within the WUI to reduce combustible fuels around their properties, prioritizing built-up areas in high to extreme wildfire exposure areas. Encourage property owners to irrigate to minimize risk.	+ Encourage property owners within the WUI to remove combustible fuels around their properties, particularly within 1.5 m of all buildings.	+ Encourage property owners within the WUI to replace hazardous vegetation with fire-resistant vegetation as vegetation declines/dies. + Create incentives for property owners within the WUI to adopt wildfire-resilient defensible space landscaping.
Wetlands (Marshes, Swamps, Peatlands)	+ If deemed necessary, reduce the amount of fine and medium surface fuels, space out heavy fuels, and verify full contact with the ground to promote moisture uptake and decomposition. The City must remain compliant with the Provincial Water Act and Wetland Policy before planning any fuel reduction measures; consult an environmental professional prior to completing work in wetland areas. + Prescribed burning may be appropriate in some areas around some wetland areas to promote ecosystem health and the regeneration of fire-adapted grasses.	+ Wetland fuel removal is not recommended. Would require provincial Water Act and Wetland Policy approval if wetland removal is deemed necessary.	+ In wetland areas that are drying or in poor health, consider wetland restoration activities to reduce wildfire risk, while gaining the benefits of functional wetlands.