breathe

EDMONTON'S GREEN NETWORK STRATEGY

Edmonton's Green Network Context
July 2016

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OVERVIEW

OVERVIEW

An Integrated Approach

Parks and open spaces are vital to a community's health. These spaces provide places for people to play, gather, grow, learn, and celebrate. The Edmonton Green Network Strategy is a holistic approach to fostering a multi-functional, integrated network of open spaces within the city. Providing a high quality open space network is more than just investment in recreation facilities and stormwater management projects; it is the creation of a connected system that promotes healthy living, supports and enhances the environment, and connects people to each other while building a sense of place. Building off The Ways guiding documents (The Way Ahead, The Way We Green, The Way We Grow, The Way We Live, and The Way We Prosper) for the City of Edmonton's Strategic Vision to 2040, the Green Network Strategy can re-envision Edmonton's Urban Parks Management Plan 2006-2016 to realize the full potential of the city's open spaces in a multi-functional network that is relevant today, and for the next 30 years.

The Green Network Strategy is aligned with the City of Edmonton's vision of holistic strategic planning that acknowledges the interdependent reality of complex urban environments; meets the needs of the present without compromising the needs of the future; supports the livability of the City; and enables the adoption of new techniques, technologies, and ways of thinking to lead progressive and meaningful change. Edmonton's Green Network Strategy is a part of the City of Edmonton's commitment to:

» Transform Edmonton's urban form;

» Enhance use of public transit and active modes of transportation;

» Improve Edmonton's liveability;

» Preserve and sustain Edmonton's environment;

» Ensure Edmonton's financial sustainability; and

» Diversify Edmonton's economy.

This commitment is reflected in the Green Network Strategy's guiding principles:

1. Recognizable and Unique: Edmonton's signature open space network highlights its unique cultural and ecological character, and celebrates the relationship between Indigenous peoples and Edmontonians in meeting the needs of a culturally diverse, rapidly-growing, thriving Metro Region – now and for future generations.

2. Integrated and Multifunctional: Edmonton's open space network integrates and layers multiple open space types and functions to form a complete system.

3. Equitable and Accessible: Edmonton's open space network is inclusive and equitably accessible.

4. Connected and Coherent: Edmonton's open space network facilitates connections for people and wildlife throughout the Metro Region.

5. High Quality Public Realm: Edmonton's high-quality public realm celebrates and connects people to our unique natural and cultural heritage.

6. Community Capacity: Edmontonians understand the value of recreation and open space, and are empowered to be active participants in the creation, stewardship, programming, and use of Edmonton's open space network.

7. Ecological Integrity and Conservation: Edmonton's open space network sustains healthy and resilient ecosystems.

8. Safety: Edmonton's open space network is safe to access and use.

9. Wellness: Edmonton's open space network promotes the health and wellness of Edmontonians through active living, access to the natural environment and connection to a vibrant, inclusive and caring community.

10. Financial Resilience: Edmonton's open space network is flexible and financially sustainable in delivering open space services in changing and growing communities.

A Multi-Functional Green Network

Edmonton's Green Network Strategy will examine how open space in the City of Edmonton functions as an integrated network of public spaces that provide real, measurable value to Edmontonians. Open spaces contribute to human health and wellness, improve the urban environment, and provide places for people to come together. These contributions are the central themes of the Green Network Strategy, and provide the organizing framework for assessing open space.

In the same way that organisms function within a natural ecosystem, open spaces function as part of a larger integrated whole within the urban ecosystem. The primary functions of open space, organized by the central themes of the Green Network Strategy, will be used to understand the role that plans, policies, stakeholders, funding strategies, and management play in providing and shaping the value of the existing open space network, and assessing the network's capacity to meet current (and future) needs of the city and residents.

For each identified function, a brief has been created that highlights the internal stakeholders, plans/policy, current projects underway, funding streams and mechanisms, stakeholder groups and organizations, best practices and trends, and precedents related to that function. Additionally, these functions will guide future spatial analysis of the quality and capacity of the open space system, as well as help provide relatable, accessible topics for internal and external engagement during the development of the Plan.

WELLNESS
Promotes healthy living. Fosters wellbeing through diverse kinds of recreation and mobility.

ECOLOGY
Supports and enhances the environment. Sustains healthy and resilient ecosystems by providing and enhancing ecological services.
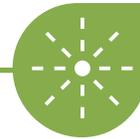
CELEBRATION
Connects people to each other and builds a sense of place. Places for communities to thrive, gather, and celebrate.

Open Space Briefs

WELLNESS

Recreation
Open spaces function as recreation spaces that accommodate sport facilities, as well as outdoor recreation, such as running, cycling, field sports/activities, walking, etc. High quality recreation spaces that are easily accessible and accommodate a range of different activities are crucial to promoting healthy living.

Active Transportation
The inclusion of well-connected, high quality trails and pathways within the open space network is key to promoting and encouraging active transportation modes, improving residents' health, improving overall mobility, reducing carbon emissions, and alleviating general demand on vehicular transportation networks.

Mental Health & Wellbeing
An important function of open space is the role of spaces in providing calm and therapy, by reducing stress and providing opportunities for the disabled or elderly to engage in therapeutic activities, such as gardening. Spending time in open spaces can foster a connection with nature that promotes spiritual fulfilment.

Learn & Play
Nature provides unique opportunities for people of all ages to learn (about environmental processes and cultural and historical heritage) through a variety of programming or free form play. Open spaces and nature are also integral to the mental and physical development of children.

ECOLOGY

Water Management
Open spaces have the capacity to handle a significant amount of stormwater, as well as provide water storage, treatment, and purification for the city, reducing the impact of urban areas on water quality and quantity in the North Saskatchewan River and its tributaries.

Climate Regulation
Open spaces provide a myriad of benefits for the urban, built environment, including mitigating the urban heat island effect, stabilizing micro-climates, reducing wind tunnels, improving air quality, and mitigating climate change.

Biodiversity
Not limited to just preservation and conservation lands, many types of open space provide habitats for plants and animals that can help ensure biodiversity and wildlife connectivity. Effective and appropriate management and regulation of these spaces is crucial to integration with other open space functions.

Waste Management
When considering the role of open space in waste management, most think of landfills. However, open spaces can be innovatively used to close the loop for waste management, providing spaces for active composting, and recycling / biofuel facilities.

Risk Mitigation
Open spaces can be used to minimize environmental risks, for example, by stabilizing slopes, protecting floodways, and repurposing contaminated sites. Rehabilitating contaminated sites (i.e. brownfields, former landfills) restores or improves the function of open spaces.

Food Production
Open spaces provide opportunities for food production, which in turn provides the city with food security, healthier communities, community interaction, food/local agriculture connections, and skill development.

CELEBRATION

Aesthetic Value
Welcoming spaces with attractive design, natural scenery and public art are place-makers, attracting and retaining people. Proper maintenance, colourful vegetation, and protection for unique views can promote aesthetic appeal.

Community Building
Open spaces make cities. They act as gathering spaces – anchors – that facilitate social interactions and providing space for programming such as community events (i.e. farmers markets, art fairs). Open spaces created in partnership with the local community foster a sense of community identity and ownership.

Public Safety
Trees and open spaces can contribute to public safety by creating a vibrant public realm, providing transitions between land uses where otherwise conflicts might occur (such as noise), and serving as a traffic calming devices. Well-designed open space can help create safer streets for pedestrians and drivers.

Heritage
Open spaces can be effectively used to highlight the cultural and historical significance of a site, a feature, or the city's heritage in general. Cultural expression in the form of public art often finds a home in the green network.

Destination & Tourism
Open spaces not only serve as gathering spaces for a neighbourhood or community, but can also function as a destination, a draw for the larger area whether the region, province, or nation.

Planning For the Green Network

Edmonton's Green Network Strategy will be built on a foundation already provided by the City of Edmonton The Ways visioning documents, the Urban Parks Management Plan 2006-2016, and the Natural Connections Strategic Plan.

The Urban Parks Management Plan was developed to guide the acquisition, design, construction, maintenance and use of City parks, the North Saskatchewan River Valley, and natural areas. This plan was formative in the way that the City of Edmonton has planned and managed its green network for the last ten years. The Green Network Strategy will build on the successes of the Urban Parks Management Plan and address its limitations while projecting open space planning ahead another 30 years. The Natural Connections Strategic Plan confirms the commitment of the City of Edmonton to integrate planning and protection measures for natural areas within municipal boundaries by strengthening the connections between natural areas and between people. The Green Network Strategy will honour the holistic systems approach of the Natural Connections Strategic Plan and will apply it to all publicly accessible outdoor spaces in the urban ecosystem.

Land Use Planning Framework

The Alberta Land-use Framework provides the legislative hierarchy for regional and municipal planning in Alberta. Under the framework there are seven regional planning areas for Alberta based on major watershed boundaries and aligned with existing municipal boundaries and natural regions. The Alberta Land Stewardship Act is the legal mechanism through which the Framework is implemented, and it supports regional planning activities and ensures coordination between the provincial government and land use decision makers. Through this Act, plans are underway to establish the North Saskatchewan Regional Plan, which includes the City of Edmonton. The Capital Region Growth Management Plan is part of the North Saskatchewan Regional Plan and supports implementation of the Land-use Framework at the metropolitan planning level for the 25 municipalities within the capital region.

The Municipal Government Act (MGA) works in tandem with the Land-use Framework and forms the legal basis for the way local governments in cities, towns, villages, and rural areas operate in Alberta. The MGA gives municipalities responsibility for land use planning within their boundaries, and requires that each municipality create a Municipal Development Plan (MDP), which outlines policies for land use for the entire municipality. The MGA also grants municipalities the power to designate lands as Municipal or Environmental Reserve, and to require developers and land owners to set aside 10% of their total developable land area as Municipal Reserve for the use of parks, recreational areas, schools, or other municipal purposes. The City of Edmonton MDP must be consistent with the North Saskatchewan Regional Plan, when completed, and the Capital Region Growth Management Plan.

Other important regional planning Acts include the Alberta Public Lands Act (2014), which requires authorization for all projects or proposed construction that is on Crown land, or will impact water bodies claimed by the Crown. Through the Act, Crown land is protected and managed to ensure the province's long term sustainability. This Act works together with the Alberta Plan for Parks (2009-2019), which outlines the province's plan for managing provincial parks specifically.

Plans and Policies by Open Space Function

Within the regulatory framework are plans and policies that directly govern the different functions of open space. These plans and policies are explored in detail within each brief, but are summarized in the following pages in terms of which functions they are related to. This summary illustrates the interconnectedness of the open space functions and the policies that influence them.

TABLE 1. PLANS / POLICIES
FEDERAL

Plan / Policy	🏃	🚲	💓	🔬	💧	🌫	🐦	♻	⚠	🌿	🌱	🌾	🌿🌿	🏙	🌳	🪧
A Framework for Recreation in Canada 2015: Pathway to Wellbeing (2015)	⊙	⊙	⊙	⊙									⊙			
Active Canada 20/20: A Physical Activity Strategy & Change Agenda for Canada (2012)		⊙		⊙												
Agriculture and Agri-Food Canada (AAFC) Regulations										⊙						
Air Quality Health Index		⊙	⊙			⊙	⊙									
Canada Ambient Air Quality Standards		⊙	⊙			⊙							⊙			
Canada Fisheries Act (2015)					⊙											
Canada Wastewater Systems Effluent Regulations (2012)					⊙											
Canada Water Act (2014)					⊙											
Canada Wildlife Act							⊙									
Canada`s Action on Climate Change		⊙				⊙	⊙									
Canadian Environmental Protection Act					⊙	⊙	⊙	⊙	⊙	⊙						
Canadian Sport Policy 2012 (2012)	⊙		⊙													
Convention on Biological Diversity (1992)							⊙									
Creating a Healthier Canada: Making Prevention a Priority (2010)	⊙		⊙													
Curbing Childhood Obesity: A Federal, Provincial, and Territorial Framework for Action to Promote Healthy Weights (2009)	⊙		⊙													
EAPA (Export/Import Hazardous Waste & Recyclable Material Regulations)								⊙	⊙							
Edmonton International Airport Zoning Regulations (2009)													⊙			
Federal Flood Reduction Program					⊙				⊙							
Federal Policy on Wetland Conservation (1991)					⊙											
Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment (2011)													⊙			
Import / Export Regulations							⊙			⊙						
Migratory Birds Convention Act (1994)							⊙									
National Recreation Statement (1987)	⊙															
Navigation Protection Act (2014)					⊙											
Pan-Canadian Physical Activity Strategy (2004)	⊙		⊙													
Species at Risk Act (2002)							⊙									
Standards and Guidelines for the Conservation of Historic Places in Canada, 2nd ed (2010)															⊙	

TABLE 2. PLANS / POLICIES PROVINCIAL

Plan / Policy	🏃	🚴	❤	🔍	💧	☀	🐦	♻	⚠	🌱	🍃	🌲	🏠	🌳	🪧
Active Alberta Policy 2011-2021 (2011)	●		●												
Aging Population Policy Framework (2010)			●												
Alberta Agriculture and Forestry Regulations										●					
Alberta Ambient Air Quality Objectives			●			●	●	●					●		
Alberta-based Offset Credit System						●	●	●							
Alberta Capital Airshed			●			●	●	●							
Alberta`s Climate Change Strategy / Leadership Plan						●	●								
Alberta Community Resiliance Program					●	●				●		●			
Alberta Env., Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (2013)					●						●				
Alberta Environmental Protection and Enhancement Act (EPEA) (2014)					●	●	●			●	●		●	●	
Alberta Framework for Water Management Planning					●										
Alberta Green Building Products and Technologies Strategy 2015						●									
Alberta Historical Resources Act														●	
Alberta Land Stewardship Act											●			●	
Alberta Municipal Policies and Procedures Manual (2001)					●										
Alberta Plan for Parks 2009-2019 (2009)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alberta Recreation Survey Results (2013)	●														
Alberta Safety Codes Council Barrier-Free Design Guide (2008)												●	●		
Alberta's Strategic Approach to Wellness (2013)	●		●	●											
Alberta's Strategy for the Management of Species at Risk (2009-2014)							●								
Alberta Subdivision and Development Regulation (2002)									●				●		
Alberta Tourism Framework 2013-2020 (2013)	●														●
Alberta Water Act (2014)					●										
Alberta Water for Life Strategy (2008)					●										
Alberta Water Quality Guidelines					●										
Alberta Wetland Pollicy (2013)					●										
Alberta Wildlife Act						●									
Alberta Weed Control Act						●				●			●		
Capital Region Ambient Air Quality Management Framework						●							●		
Capital Region Ozone Management Plan		●				●							●		
Climate Change and Emissions Management Act						●		●					●		
Creating Connections: Alberta's Addiction and Mental Health Strategy (2011)			●												
Floodway Development Regulations (Bill 27)									●						
Going the Distance (2014): Alberta Sport Plan 2014-2024	●		●												
Municipal Recovery Toolkit									●						
North SK River Intgrates Watershed Management Plan (2012)					●										
Recreation: A Best Buy in Public Health (ARPA) (2004)	●														
Standards for Composting Facilities in Alberta								●		●					
Storm Water Management Guidelines for Alberta (1999)					●										
Water Management Framework fo the Industrial Heartland and Capital Region					●										
Waste Control Regulations								●	●						

TABLE 3. PLANS / POLICIES
CITY OF EDMONTON

Plans / Policies	🏃	🚲	❤️	🔍	💧	☀️	🐦	♻️	⚠️	🌱	🍂	👥	🏛️	🌳	🌲	🪧
10-Year Gymnasium Strategy (2013)	●															
10-Year Arena Capital Development Strategy 2009-2019 (2007)	●															
Active Transportation Policy C544 (2009)		●				●										
Aging in Place Study (2007)			●									●				
Artificial Turf Plan 2009-2015 (2008)	●															
Bicycle Transportation Plan (2009)	●	●														
Biodiversity Action Plan							●									
Bylaw 15982 (No Idling Outside Schools/Hospitals)			●			●										
Capital City Downtown Plan (2010)		●									●	●			●	●
Carbon Dioxide Reduction Edmonton Program						●			●				●			
Celebrating Wild Adaptations in a World of Extremes: Edmonton Valley Zoo Master Plan Update (2005)				●												●
Child Friendly Edmonton Strategy (2006)	●			●								●				
City Centre Area Redevelopment Plan	●	●			●	●			●	●	●	●		●		
City of Edmonton Design and Construction Standards					●						●		●			
City of Edmonton Historical Resources Management Plan														●		
City of Edmonton North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)					●	●	●				●					
City of Edmonton Source Water Protection Plan					●											
City of Edmonton Wetland Strategy (2012)					●											
City Operations GHG Management Plan						●	●		●							
Citywide Natural Area Management Plan					●	●	●				●					
Community Energy Transition Strategy						●						●				
Community Facilities and Parks Accessiblity Guide (2010)	●											●				
Community Standards Bylaw 14600							●				●	●	●			
Corporate Tree Management Policy C456A						●	●				●					
Designing New Neighbourhoods: Guidelines for Edmonton's Future Residential Communities		●			●	●					●	●	●	●		
Development Setbacks from River Valley Ravine (Policy C542)					●		●		●		●					
Drainage Services Master Plan 2004-2014 and 2015-2024					●											
Drainage Services Stormwater Quality Strategy (2006)					●											
Edmonton Active Recreation and Sport Strategy: 2016-2026	●		●													
Edmonton Complete Streets Guidelines		●									●					
Edmonton Design and Construction Standards											●	●	●			
Edmonton Historic Resource Management Plan (2009)														●		
Edmonton International Airport Vicinity Protection Area Regulation (2006)													●			
Edmonton Public Art Master Plan (2008)											●	●			●	●
Edmonton's Stormwater Quality Control Strategy and Action Plan (2008)					●											
ELEVATE Report of the Community Sustainability Task Force (2012)												●	●			
Energy Transition Strategy Policy C585		●				●			●							
Environmental Policy C512					●	●	●									
Environmental Management Systems Policy C501					●	●	●									
For the Love of Winter: Edmonton's Winter City Strategy											●	●	●	●		●
Fort Edmonton Park Master Plan				●										●		●
Fresh: Edmonton's Food and Agriculture Strategy				●						●	●	●	●	●		
Green Building Plan and Policy C567				●		●	●	●			●					
Growth Coordination Strategy (2012)	●	●														

TABLE 3. PLANS / POLICIES CITY OF EDMONTON (CONT.)

Column legend (icons left→right): C1 recreation/running · C2 cycling · C3 health · C4 research · C5 water · C6 energy/sun · C7 wildlife/bird · C8 recycling · C9 hazard · C10 naturalization · C11 plant · C12 grass · C13 sign · C14 tree · C15 tree

Plan / Policy	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
Herbicide-Free Sites			●			●							●		
Integrated Pest Management Policy C501			●			●							●		
Low Impact Development Best Management Practices Design Guide (2014)					●					●					
Medium Size Stadium Strategy (2014)	●														
Medium Term Recreation Facility and Sports Field Plan (2008)	●														
Municipal Cemeteries Master Plan (2008)	●									●					
Natural Area Systems Policy C531					●	●	●								
Natural Connections Strategic Plan					●	●	●								
North Saskatchewan River Valley and Ravine System					●	●	●		●	●					
North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188	●				●				●	●					
Organics Processing Program						●		●							
Outdoor Aquatic Strategy 2008-2017 (2006)	●														
Parks and River Valley Conservation Report					●	●	●								
Parkland Bylaw 2202	●	●	●	●	●	●	●			●	●	●			
Parkland and River Valley Utility Installation (Policy C307)					●		●			●					
Percent for Art Policy C458C										●	●			●	●
Proposed Walkability Strategy for Edmonton (2009)	●	●									●	●			
REACH Report (2009)											●	●			
Recreation Facility Master Plan (2004)	●														
Recreation User Fee Policy C167B (2014)	●	●	●	●											
Renewable Energy Taskforce (Report)						●		●							
Ribbon of Green Concept Plan (1990) and Master Plan (1992)	●				●	●	●		●	●					
River Access Strategy and Guiding Principles Policy C586	●				●		●								
River Valley Alliance Plan of Action (2007)	●				●	●	●		●						
Roadways and Parks Naturalization Master Plan					●	●	●			●					
Seniors' Centres Plan 2011-2021 (2011)	●		●										●		
Snow Storage Facilities	●					●									
Sustainable Building Policy C532					●	●	●	●							
The Art of Living: A Plan for Securing the Future of Arts and Heritage in the City of Edmonton (2008)											●			●	●
The Way Ahead: Edmonton's Strategic Plan 2009-2018	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
The Way We Green: the City of Edmonton's Environmental Strategic Plan (2011)	●				●	●	●	●	●	●					
The Way We Grow: Edmonton's Municipal Development Plan (MDP) Bylaw 15100 (2010)	●				●		●	●							
The Way We Live Implementation Plan (2012)	●								●	●	●				
The Way We Live: the City of Edmonton's People Plan (2010)	●								●	●	●				
The Way We Prosper: A New Direction for Economic Development (2013)															●
Top of Bank Policy C542 (2010)					●		●			●					
Turning Design Upside Down: Civic Precinct Master Plan (2013)										●	●			●	●
Urban Forest Management Plan						●	●			●					
Urban Parks Management Plan (2006)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Waste Management Centre and Recycling Depots						●		●	●						
Wildlife Passage Engineering Design Guidelines							●			●					
Zoning (Bylaw 12800)					●	●	●	●	●	●					

Engaging the Community

The City of Edmonton is committed to timely and transparent communication. Because of the city-wide scale, regional impacts and time frame of this project, a network of interlinking engagement activities will be fundamental to the success of the Green Network Strategy. Stakeholders within the City of Edmonton's municipal government will be engaged throughout the project, helping to align the Green Network Strategy with other city strategies. The engagement process will give staff the opportunity to:

» Provide feedback as to how the Green Network Strategy can align with City plans, strategies, and policies;

» Facilitate informed decisions about the future of open space planning/design/management (plan development and implementation);

» Validate the draft vision and guiding principles throughout the engagement process;

» Jointly determine how the public's vision/desired outcomes can be implemented; and

» Help establish priorities for improvement expenditures.

» Additional details regarding the internal stakeholder engagement process are outlined in the Internal Engagement Plan included in Attachment A.

The Green Network Strategy should be built and owned by the people that live in the neighbourhoods. Edmontonians will be asked to identify key uses, needs and strategies for green spaces and participate in an ongoing dialogue about building a green network, what these spaces might look like in the future, and how these spaces can support neighbourhoods as well as ecological and infrastructure needs. Edmontonians will be engaged in the planning process during all key project stages.

The public engagement process for the Green Network Strategy will aim to make the most of stakeholders' and citizens' input and problem-solving potential, help build community, and help create advocates for the transformative vision of Edmonton's green network. Additional detail on the scope and goals of the public engagement process are outlined in the Public Engagement Plan included in Attachment B.

> As part of the engagement process, the City of Edmonton has reached out to stakeholders - community organizations, industry groups, and others - to help build the Strategy. Even if your group was not formally contacted to participate, the City wants to hear your perspectives and feedback through one of the many platforms or events listed in the Public Engagement Plan.

TABLE 4. INTERNAL STAKEHOLDERS

	🏃	🚲	❤️	🔍	💧	☀️	🐦	♻️	⚠️	🌱	🌳	🌿	🏕️	🌲	🪧
Citizen Services - Community & Recreation Facilities	⊙	⊙	⊙	⊙				⊙	⊙	⊙	⊙	⊙		⊙	⊙
Citizen Services - Community Inclusion & Investment	⊙	⊙	⊙	⊙				⊙	⊙		⊙	⊙		⊙	⊙
Citizen Services - Community Standards	⊙	⊙	⊙	⊙				⊙	⊙		⊙	⊙	⊙		
Citizen Services - Fire Rescue Services													⊙		
Citizen Services - Integrated Strategic Development	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Citizen Services - Neighbourhoods	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	
City Operations - Building & Parks Operations	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			⊙
City Operations - Edmonton Transit					⊙	⊙						⊙			⊙
City Operations - Fleet Services					⊙										
City Operations - Transportation Operations		⊙			⊙							⊙			
City Operations - Utility Services					⊙	⊙									
Integrated Infrastructure Services - Drainage Services					⊙		⊙								
Integrated Infrastructure Services - Facilities & Landscape Infrastructure	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Integrated Infrastructure Services - LRT Projects	⊙	⊙	⊙	⊙		⊙	⊙						⊙		
Integrated Infrastructure Services - Transportation Infrastructure		⊙				⊙	⊙						⊙		
Integrated Infrastructure Services - Utilities Infrastructure					⊙	⊙	⊙		⊙				⊙		
Sustainable Development - City Planning	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Sustainable Development - Development Services	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Sustainable Development - Economic & Environmental Sustainability	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Sustainable Development - Real Estate & Housing					⊙	⊙	⊙		⊙		⊙	⊙		⊙	

TABLE 5. EXTERNAL STAKEHOLDERS FEDERAL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Canadian Association for Conservation							●							●	
Canadian Forestry Service											●				
Canadian Heritage (Government of Canada)														●	
Canadian Heritage Information Network														●	
Canadian Public Arts Funders											●			●	
Commuter Challenge	●	●	●												
Creative City Network of Canada												●		●	
Destination Canada															●
Environment and Climate Change Canada		●			●	●	●	●	●						
Fisheries and Oceans Canada					●										
International Council on Monuments and Sites (ICOMOS) Canada														●	
Mental Health Commission of Canada			●												
Parks Canada	●										●			●	
Pest Management Regulatory Agency							●						●		
Public Health Agency of Canada	●	●	●	●									●		
Royal Canadian Mounted Police													●		
Transportation Canada		●			●								●		

TABLE 6. EXTERNAL STAKEHOLDERS PROVINCIAL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Alberta Agriculture											●	●			
Alberta Culture and Tourism	●	●		●							●			●	●
Alberta Education				●											
Alberta Env. Monitoring, Eval. & Reporting Agency (AEMERA)					●	●					●			●	●
Alberta Environment and Parks (AEP)	●	●	●	●	●	●	●						●		
Alberta Health Services (AHS)	●	●	●											●	
Alberta Historical Resources Foundation					●	●									●
Alberta Hotel and Lodging Association															●
APPLE Schools: Alberta Project Promoting Active Living & Healthy Eating	●		●	●											
Capital Region Board	●	●		●	●	●		●		●		●	●		●
Confederacy of Treaty 6 First Nations	●	●	●	●	●	●	●			●	●	●	●	●	●
Health & Physical Education Council - The Alberta Teachers' Association	●		●	●											
Healthy U (Province of Alberta)	●		●	●											
Metis Nation of Alberta	●	●	●	●	●	●	●			●	●	●	●	●	●

TABLE 7. EXTERNAL STAKEHOLDERS CITY OF EDMONTON & OTHER ORGANIZATIONS

Organization	🏃	🚲	❤	🔍	💧	☀	🐦	♲	⚠	🌱	🍃	👪	🏞	🌲	🪧
Alberta Bicycle Association		⊙													
Alberta Biodiversity Monitoring Institute							⊙								
Alberta Centre for Active Living	⊙		⊙		⊙							⊙			
Alberta Conservation Society							⊙				⊙				
Alberta Council for Environmental Education				⊙							⊙				
Alberta Environmental Network					⊙	⊙	⊙	⊙	⊙	⊙					
Alberta Land Trust Alliance					⊙		⊙				⊙				
Alberta Low Impact Development Partnership					⊙										
Alberta Public Health Association (APHA)	⊙	⊙	⊙												
Alberta Recreation & Parks Association	⊙	⊙	⊙	⊙			⊙				⊙	⊙	⊙	⊙	⊙
Alberta Riparian Habitat Management Society (Cows & Fish)					⊙		⊙								
Alberta Water Council	⊙				⊙		⊙								
Boys and Girls Clubs of Canada (Western Region)	⊙		⊙	⊙											
Business Improvement Areas (BIAs) and Business Revitalization Zones (BRZs)											⊙	⊙	⊙		⊙
Canada Sport for Life	⊙		⊙												
Canada Walks		⊙	⊙									⊙			
Canadian Coalition for Public Health in the 21st Century	⊙	⊙	⊙	⊙											
Canadian Fitness and Lifestyle Research Institute	⊙	⊙	⊙	⊙											
Canadian Land Reclamation Association								⊙	⊙						
Canadian Parks and Wilderness Society (CPAWS) Northern Alberta Chapter	⊙		⊙		⊙		⊙					⊙			
Canadian Playground Safety Institute				⊙								⊙			
Canadian Public Health Association (CPHA)	⊙		⊙	⊙											
Canoeheads	⊙				⊙										
Capital City Health Authority					⊙	⊙					⊙	⊙			
Centre for Public Involvement											⊙	⊙			
Ceyana Canoe Club	⊙				⊙										
Child and Nature Alliance of Canada	⊙		⊙	⊙											
Children and Nature Network				⊙			⊙								
Communities in Bloom							⊙				⊙				⊙
Convention on Biological Diversity					⊙		⊙								
DirtGirls (Women's Mountain Bike Club)		⊙													
Earth Rangers				⊙			⊙								
EcoCity					⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
Edmonton & Area Land Trust					⊙		⊙								
Edmonton Arts Council											⊙	⊙		⊙	⊙
Edmonton Bicycle & Touriing Club		⊙													
Edmonton Bicycle Commuters' Society		⊙													
Edmonton Bird Club							⊙				⊙				
Edmonton BMX	⊙	⊙													
Edmonton Canoe	⊙				⊙										
Edmonton Catholic School Board	⊙			⊙											
Edmonton Chamber of Commerce											⊙	⊙		⊙	⊙
Edmonton Chamber of Voluntary Organizations												⊙			
Edmonton Community Sustainability Partnership							⊙					⊙	⊙		
Edmonton Disc Golf Association	⊙														
Edmonton Dragon Boat Festival Association	⊙				⊙										⊙
Edmonton Dragon Boat Racing Club	⊙			⊙	⊙										

TABLE 7. EXTERNAL STAKEHOLDERS CITY OF EDMONTON & OTHER ORGANIZATIONS (CONT.)

Organization	🏃	🚲	❤	🔍	💧	☀	🐦	♻	⚠	🌱	🌿	👥	🏞	🌲	🪧
Edmonton Economic Development Corporation															●
Edmonton Federation of Community Leagues										●	●	●	●	●	●
Edmonton Francophone School Board	●			●											
Edmonton Heritage Council														●	
Edmonton Historical Board														●	
Edmonton Horticultural Society			●	●						●	●				
Edmonton Masters Cycling Club		●													
Edmonton Mountain Bike Alliance		●													
Edmonton Native Plant Group				●			●	●			●				
Edmonton Natural Areas Advisory Committee							●				●				
Edmonton Naturalist Society							●				●				
Edmonton Nature Club	●		●	●	●	●	●		●		●				
Edmonton Off Leash Dog Walking Group (Meetup Group)	●														
Edmonton Outdoor Club (Meetup Group)	●		●												
Edmonton Outrigger Canoe Club	●														
Edmonton Paddling Centre	●														
Edmonton Public Libraries				●								●		●	
Edmonton Public School Board	●			●											
Edmonton Road and Track Club	●														
Edmonton Running Club	●	●													
Edmonton Sport Council	●		●												●
Edmonton Whitewater Paddlers	●				●										
Environmental and Outdoor Education Council				●			●								
Evergreen					●	●	●			●	●	●			
Faith communities												●		●	
Federation of Alberta Naturalists					●	●	●			●	●				
Federation of Canadian Municipalities										●					
Forest School Canada				●			●			●					
Glenora Child Care Society				●											
Greater Edmonton Alliance													●		
Greater Edmonton Racing Kayak Club	●				●										
Green Communities					●	●	●	●	●	●		●			
Haskin Canoe	●				●										
International Union for the Conservation of Nature (IUCN)							●								
Kids at Hope	●			●			●								
Landscape Alberta	●			●			●			●	●				
Leisure Information Network (LIN)	●	●	●	●											
Local bicycle shops		●													
Local Governments for Sustainability							●								
Make Room for Play (ParticipACTION)	●			●											
Make Something Edmonton	●	●		●								●			●
Mill Woods Cultural and Recreational Facility Association	●	●										●		●	
Mill Woods Crime Council													●		
Mistaya Paddling Club	●														
Mountain Equipment Co-op	●	●													
Nature Alberta	●		●	●	●		●				●			●	
Nature Conservancy of Canada				●	●		●				●				

TABLE 7. EXTERNAL STAKEHOLDERS CITY OF EDMONTON & OTHER ORGANIZATIONS (CONT.)

	Run	Cycle	Health	Research	Water	Air	Wildlife	Recycle	Hazard	Plants	Trees	People	Park	Forest	Signage
North Alberta Institure of Technology (NAIT)										⊙					
North Saskatchewan River Valley Conservation Society					⊙		⊙								
North Saskatchewan River Keeper					⊙										
North Saskatchewan Watershed Alliance					⊙		⊙								
Northlands										⊙					
Northwest Voyeageurs Canoe and Kayak Club	⊙				⊙										
Paddle Alberta	⊙				⊙										
Pan-Canadian Joint Consortium for School Health			⊙	⊙											
Pan-Canadian Public Health Network	⊙	⊙	⊙	⊙									⊙		
PLUS Network							⊙								
Prescription to Get Active	⊙	⊙	⊙												
REACH Edmonton Council for Safe Communities													⊙		
Residents' and homeowners' associations	⊙	⊙		⊙						⊙	⊙	⊙	⊙		
River City Runners	⊙	⊙													
River Valley Alliance	⊙		⊙	⊙	⊙	⊙	⊙				⊙				
RiverWatch					⊙	⊙	⊙								
Scouts and Girl Guides of Canada	⊙			⊙			⊙					⊙			
Seniors' associations and clubs	⊙	⊙	⊙							⊙		⊙	⊙		
Show Up and Play Sports Edmonton (Meetup Group)	⊙		⊙												
Society to Prevent Dutch Elm Disease											⊙				
Sustainable Food Edmonton				⊙						⊙		⊙			
The Edmonton Hiking/Walking (Meetup Group)	⊙		⊙												
The Edmonton Rowing Club	⊙				⊙										
The North Saskatchewan River Conservation Society							⊙				⊙			⊙	
The Sierra Club	⊙		⊙	⊙			⊙								
Toxics Watch Society of Alberta					⊙	⊙	⊙						⊙		
Trails, Paths, and Routes Advisory Committee		⊙			⊙		⊙								
University of Alberta - environmental and outdoor education specialists	⊙			⊙	⊙		⊙								
Urban Development Institute					⊙				⊙						
UWALK	⊙														
Valley Zoo Development Society				⊙											⊙
Wildlife Rehabilitation Society of Edmonton							⊙		⊙						

Paying for the Green Network: An Overview of Open Space Funding and Financing

Municipalities face tight budgets and increased pressure for every financial decision they make. Infrastructure needs such as roads, bridges, water, energy, and sewerage can often take precedence over other types of spending; as a result, it is estimated that there is a $15.25 billion deficit in recreational and cultural infrastructure funding in Canada (Innovative Finance for Urban Spaces and Places, Action Canada Foundation, 2015). However, innovative funding mechanisms for open space development and provincial and federal grant programs can help support sustainable urban development. General municipal funding mechanisms and funding sources specific to the different functions of open space are identified here. Other funding mechanisms are also included in each open space function brief.

Public Funding

» Tax revenue (residents)

» Special levies (separate from general tax)

» Transportation revenues / incentives

» Transfer payments and contributions (federal/provincial)

» Government service partnerships

Financial Planning

» Capital Improvement Planning funds

» Strategic budget allocations

» Contingency funds

» Full-cost accounting practices

User Fees and Levies

» Permitting / licensing fees for storm water discharge, sewer extensions, sewer / wastewater hookups, etc.

» Utility fees (water, wastewater, storm water)

» Park entrance fees, recreational fees, etc.

» Developer fees

» Special district financing

Credits and Incentives

» Credit / rebate programs for water conservation practices

» Rebates and installation financing for green infrastructure

» Municipal bonds / loans

» Private partnerships (sponsorships)

WELLNESS

The Green Network promotes healthy living and fosters wellbeing through diverse kinds of recreation and mobility.

WELLNESS

Recreation

Open spaces function as a recreation spaces that accommodate sport facilities, as well as outdoor recreation, such as running, cycling, field sports/activities, walking, etc. High quality recreation spaces that are easily accessible and accommodate a range of different activities are crucial to promoting healthy living.

Key External Stakeholders / Organizations

In the past two decades, the connection between residents' health and active lifestyles has solidified and evolved, such that recreation is not just for outdoor or sports enthusiasts, but also actively encouraged and promoted by public health groups. Edmonton's Green Network Strategy can take advantage of this growing relationship to further encourage the integration of prescriptive and preventative health measures with a quality, comprehensive and accessible system of recreation spaces and facilities. In addition to local sport organizations and clubs, and schools (including higher level education), other potential external stakeholder groups include health-oriented agencies, national advocacy and best practice groups, and loosely networked social media based clubs, such as Meetup groups. See below for a complete list of potential external stakeholders and partners.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how recreation is developed and planned for within Edmonton's Green Network.

Alberta Centre for Active Living

Alberta Culture and Tourism

Alberta Environment and Parks (AEP)

Alberta Health Services (AHS)

Alberta Public Health Association (APHA)

Alberta Recreation & Parks Association

Alberta Water Council

APPLE Schools: Alberta Project Promoting Active Living & Healthy Eating

Boys and Girls Clubs of Canada (Western Region)

Canada Sport for Life

Canadian Coalition for Public Health in the 21st Century

Canadian Parks and Wilderness Society (CPAWS) Northern Alberta Chapter

Canadian Public Health Association (CPHA)

Canoeheads

Ceyana Canoe Club

Child and Nature Alliance of Canada

Edmonton Canoe

Edmonton Dragon Boat Festival Association

Edmonton Dragon Boat Racing Club

Edmonton Nature Club

Edmonton Off Leash Dog Walking Group (Meetup Group)

Edmonton Outdoor Club (Meetup Group)

Edmonton Outrigger Canoe Club

Edmonton Paddling Centre

Edmonton public and private schools (including higher level education)

Edmonton Sport Council

Edmonton Whitewater Paddlers

Ever Active Schools

Greater Edmonton Racing Kayak Club

Haskin Canoe

Health & Physical Education Council – The Alberta Teachers' Association

Healthy U (Province of Alberta)

Leisure Information Network (LIN)

Make Room for Play (ParticipACTION)

Make Something Edmonton

Mistaya Paddling club

Mountain Equipment Co-op

Nature Alberta

Paddle Alberta

Pan-Canadian Joint Consortium for School Health

Pan-Canadian Public Health Network

Prescription to Get Active

Public Health Agency of Canada

River Valley Alliance

Show Up and Play Sports Edmonton (Meetup Group)

The Edmonton Hiking/Walking (Meetup Group)

The Edmonton Rowing Club

The North Saskatchewan River Conservation Society

The University of Alberta – environmental and outdoor education specialists

Other Edmonton sports organizations and clubs

Relevant Plans & Policies

Recreation can take place almost anywhere; to varying degrees, recreation is a part of almost every open space. As a key component to quality of life and creating complete communities, many city plans and policies involve recreation. Several national and provincial plans and advocacy / leadership groups also provide documents that establish both recreation strategies for the area and best practices for recreation in open spaces. In addition to Edmonton's Urban Parks Management Plan and the Natural Connections Strategic Plan, there are several recreation-specific documents that can provide guidance in the development of the Green Network Strategy.

A Framework for Recreation in Canada 2015: Pathway to Wellbeing (2015)

Pathway to Wellbeing is a joint initiative by the Interprovincial Sport and Recreation Council and the Canadian Parks and Recreation Association to define recreation, explore the challenges and benefits of recreation today, and provide a new vision and direction for recreational goals and their underlying values and principles. The Framework highlights a set of recreation priorities based on the document's five goals: Active Living, Inclusion and Access, Connecting People and Nature, Supportive Environments, and Recreation Capacity. These priorities are intended to improve recreation experiences across Canada, and in so doing address the key trends across Canada that are both challenges and opportunities for recreation. These trends are as follows:

» The population is aging, with a declining proportion of children, and an increasing proportion of older adults. This trend is particularly pronounced in rural areas, where young people migrate to urban centres, and the elderly wish to "age in place."

» Canada's population is becoming increasingly diverse, with immigrants from around the world, and a younger and faster-growing Aboriginal community than before.

» Rapid urbanization (80% of Canadians now live in cities) is placing more demand on open space and recreation opportunities in cities.

» Modern lifestyles combined with changes in the built environment and social communities have precipitated several negative health trends leading to increased risk behaviours (i.e. sedentary living), chronic diseases (i.e. diabetes and heart disease), and mental health concerns (i.e. depression and youth suicide).

» The rising economic inequality in Canada. Individuals and families with lower incomes typically have fewer opportunities for recreational experiences due to costs associated with transportation, equipment, some activities, and facility rental.

» Rapid social changes associated with increasing inequities, persistent unemployment, rapid development, the prevalence of social media, and the loss of traditional supports have compounded feelings of isolation for many people, and negatively affected civic involvement, social connectedness, community engagement, and social cohesion, all of which are key components to a quality green network and recreation community.

» The recreation field is challenged to access and keep up with rapidly changing technologies, in order to provide opportunities for innovation, communication, improved efficiency, and enhanced connections (especially with young people). In contrast, there is growing concern with the increasing amount of time people spend connected to the digital world, and the related reduction of time spent outdoors and pursuing recreation activities.

» The many infrastructure deficits in communities across Canada – including the need to develop basic walking and cycling routes, facilities, and open spaces – vary significantly across communities, with some needing initial investments and others needing upgrades or reinvestment.

» Growing threats to the natural environment place additional environmental stresses on the spaces and places where people pursue recreational activities, necessitating the growing need for environmental stewardship as a major component of the recreation sector.

Active Canada 20/20: A Physical Activity Strategy & Change Agenda for Canada (2012)

Active Canada 20/20 provides a vision and an agenda to increase physical activity and reduce sedentary behaviour. Intended to engage decision makers and coordinate efforts between stakeholders at every level, this document focuses on recommendations that encourage physical activity and promote change. As a result, this document is an excellent resource for considering all interest groups and potential recreation partnerships.

Alberta Recreation Survey Results (2013)

First developed in 1981, this survey was conducted to determine participation patterns of Albertans and the factors which influence their recreation activity choices. This survey was conducted as a joint effort by Alberta Tourism, Parks and Recreation, and the Cities of Calgary, Edmonton, and Lethbridge. With a sample size of almost 2,000 people, some of the key insights are as follows:

» There is a high level of participation in leisure and recreational activities (about 98% of Albertans), with the most popular being physical activities, outdoor activities, and creative/cultural activities.

» The most popular activities are walking (13% first favourite), golf (9% first favourite), and camping (8% first favourite), with the preferred location of participation being in parks or outdoor space (58%).

» The top three motivations for leisure and recreational activities are: pleasure (89%), relaxation (86%), and physical health/exercise (83%).

» Over one-third of those surveyed would like to partake in an activity they're not currently doing, particularly swimming, gym/fitness, and yoga.

» The main barriers to participation in new activities are being too busy, various costs, and overcrowding.

» Nearly two out of five Albertans have participated in volunteer work having to do with culture, recreation, sports, or parks in the past 12 months, with Albertan volunteers averaging 6.6 hours per week.

» A high majority (88-95%) of Albertans agree with the importance of the benefits of recreation and parks.

» Over 75% of Albertans are in favour of picnic areas (88%), playing fields (78%), and courts (76%) in municipal parks and recreation areas, while snowmobiling (23%) and motorized off-road vehicles (17%) have less support.

» Participation by women and children is also highlighted as a concern, with a need to take efforts to address barriers in their participation.

Canadian Sport Policy 2012

This policy sets direction for the period of 2012-2022 for all governments, institutions, and organizations that are committed to realizing the positive impacts of sport on individuals, communities, and society. This document identifies high level policies and goals as a type of road map to guide the development of recreational, competitive, and high performance sports, as well as sports as a tool for social and economic development in communities. This document will be useful in identifying the types of goals and strategies Edmonton should consider in planning for recreation spaces, the different types and purpose of sports, and the different stakeholder groups to involve.

Community Facilities & Parks Accessibility Guide (2014)

The Guide was produced to inform Edmonton residents and visitors about the accessibility of Edmonton recreation facilities and parks. The accessibility of Edmonton's public recreation facilities and parks was assessed and rated with a score of 1 to 5. The facilities and parks reviewed include: indoor leisure centres/pools, outdoor leisure centres/pools, sport and fitness facilities, other recreation centres, attractions, golf courses, indoor arenas, and river valley parks. This document will help in the initial assessment of the quality and capacity of Edmonton's existing green network and its amenities in meeting residents' needs, as well as help identify standards and existing examples of quality recreation facilities in the city.

Going the Distance: Alberta Sport Plan 2014-2024

The Alberta Sport Plan provides a coordinated approach to advancing sport in Alberta. This document introduces a framework to set the direction for all committed stakeholders to realize the positive impacts of sports for individuals and communities across Alberta. The Province outlines its vision for Alberta as the national leader in sport, with a coordinated and adaptive system which promotes excellence and fosters opportunities for life-long participation for all Albertans. Through this document, the Province outlines a plan to: (1) coordinate efforts and activities, (2) advance the Alberta sport system, and (3) positively impact Albertans.

National Recreation Statement (1987)

Commissioned by the Minister of Recreation, this document provides a working definition of recreation, recognizes its importance to individuals and communities, and provides the basis of a National Recreation Framework. Additionally, this document outlines the roles of the federal, provincial/territorial, and municipal government in providing recreation spaces and facilities, and identifies the municipality as the primary agency for providing recreation services.

Recreation: A Best Buy in Public Health (ARPA) (2004)

As primarily an advocacy and informational report, this document provides an overview of the many benefits of recreation, including physical, psychological, environmental, social, and community benefits. Additionally, this document explores recreation's role in aiding children in positive development through play, providing positive activity alternatives for youth, acting as a balance and stress relief for adults at home and at work, and improving the overall quality of life for seniors. The general recommendations provided in this document can provide guidance in developing the higher level strategy for providing recreation, as well as mental health and wellbeing, and learn and play opportunities in the green network.

Dogs in Open Spaces Strategy (2016)

This policy is intended to develop strategic direction and park management instructions (i.e. guidelines, standards, responsibilities, and standard operating procedures) to provide sustainable and safe off-leash opportunities within the city. The policy culminated from a review of various existing policies and practices, which identified recommendations and best practices for off-leash areas; over the next year, the City will be undertaking site assessments and stakeholder engagement to inform an implementation plan. Public consultation completed in developing the Strategy offers excellent user feedback regarding the City's existing dog parks and desired facilities, and background research provides general planning guidelines for dogs in open spaces (regarding design of off-leash areas, site uses and adjacencies, as well as site selection, distribution, and funding, among other topics).

Recreation Facility Master Plan 2005-2015 (Update Underway)

This plan was developed by the City's Community Services department to provide a comprehensive strategy for public recreation facilities for the City of Edmonton, as well as a key action step in the City's Integrated Service Strategy. The Plan is currently (as of 2016) being updated, and once complete, this document will be useful in the Green Network Strategy process by providing context for the development of recreational facilities, as well as an providing an overview of existing facilities, partnerships, implementation methods, and costs for recreation facilities in Edmonton. Additionally, the plan highlights what the community values in regards to recreation, as follows:

» A sense of community
» Health and wellness
» Inclusiveness
» Safety
» Partnerships
» Civic pride
» Integrated Services

While the Green Network Strategy will not provide the same level of the detail as the Recreation Facility Master Plan, it will be able provide direction for its development and implementation.

Ribbon of Green: North Saskatchewan River Valley and Ravine System Concept Plan (1990) and Master Plan (1992)

Although these documents are discussed in some detail in the Biodiversity and Heritage Briefs, they also provide important guiding policy for recreation spaces in the city. They establish a long-term strategy for balancing preservation of the natural environment, conservation of historic resources, and development of public facilities in the river valley and ravines. The result is the division of the valley into three land management planning units: extensive use areas, suitable for a broad range of recreation services and facilities bordering major roads and pathways; conservation areas, suitable for low-intensity, trail-based recreation activities but oriented toward environmental naturalization and rehabilitation; and preservation areas, suitable for limited public access and recreational improvements. The Plan also establishes standards for trails and recreational amenities, guidelines for environmental review during construction or upgrading of park amenities, and a concept for recreational facilities in each of the five major parks.

Overall, the Concept and Master Plans provide a framework for recreational space and amenity planning over a significant portion of the city's green network.

Joint Use Agreements

Many sports fields, playgrounds and other recreational facilities are constructed and operated under Joint Use Agreements, which are partnerships among the City of Edmonton, Edmonton Public Schools, Edmonton Catholic Schools and the Conseil scolaire Centre-Nord (Central North Francophone Schools) for the planning and use of shared public facilities. This includes use of school gymnasiums for community groups after school hours, shared use of sports fields by students and the community, and the planning, development and maintenance of Joint Use Sites. These sites are a cornerstone in the provision of recreational open space, particularly playgrounds and sports fields; the Agreements that govern them must be considered in future planning for the green network.

Recreation User Fee Policy C167b (2014)

This policy provides a balanced approach for establishing fees that make efficient use of City resources; promote the shift from tax- to user-supported recreational services; provide a consistent process that encourages accessibility and participation; identifies pricing for different user groups; and establishes realistic but flexible goals to meet evolving social values and fiscal pressures.

Recreation Facility Plans

Several documents address specific recreation facilities. These will be useful in the assessment of Edmonton's recreation capacity, such as determining their location, quality, and future plans for additional spaces and facilities. These documents, which all originated from the 2004 Recreation Facility Master Plan update, include:

» **10-Year Gymnasium Strategy (2013)** focuses on City operated and maintained spaces (including those jointly operated and separately owned) that are indoor, with defined boundaries and managed access, and are suitable for gymnasium activities (such as basketball, volleyball, badminton, and floor hockey). Spaces reviewed do not include temporary use (such as auditoriums or arenas) or spaces with specialized surface, such as artificial turf fields. These spaces can be stand alone or linked with other indoor facilities as part of a larger recreation centre.

» **10-Year Arena Capital Development Strategy 2009-2019** provides a more specific analysis on the existing stock of arenas, and describes the community's priorities for future amenities, accounting for the City's current total inventory and overall current and future demands.

» **Artificial Turf Plan 2009-2015** is intended to assist the City in identifying short and mid-term rectangular artificial turf field locations, as well as field design preference recommendations and priorities for development/redevelopment.

» **Outdoor Aquatic Strategy 2008-2017** is a guide for the City's involvement in providing, developing, and managing outdoor aquatic amenities and facilities in Edmonton over the next ten years.

» **Medium Size Stadium Strategy (2014)**
The City of Edmonton defines a "medium size stadium" as an outdoor sport venue that includes 5,000 to 10,000 seats with an artificial rectangular turf field. This strategy provides a framework for a phased approach to meet the current and future needs for a stadium, by identifying the triggers for the phased development with site and program requirements, as well as operating and business model recommendations for the City.

» **Medium Term Recreation Facility and Sports Field Plan (2007)** provides more specific analysis on three priority areas of Edmonton (northeast, southeast, and west) by identifying the existing stock of facilities and amenities, as well as the community's priorities for future amenities. The Plan recommends the development of multi-purpose recreation facilities and District Activity Parks (active spaces that accommodate high schools, major recreation centres, and a massing of sports fields that create a balance between open space requirements and facility land requirements) that respond to geographic areas with populations ranging from 40,000 to 80,000 people.

Relevant Projects & Programs Underway

There are several recreation-related projects currently underway in Edmonton that will both inform the Green Network Strategy and benefit from the results of the project. The following is an overview of some of the major recreation-related projects in the city.

Edmonton Active Recreation and Sport Strategy 2016-2026

This strategy is currently being completed by the City. As a recommendation of The Way We Live Strategic Plan, this strategy is intended to raise awareness and help encourage Edmontonians to become more physically active, whether through sports, active living, or other recreational activities. Furthermore, this strategy will provide a road map for supporting active recreational and sporting needs of all Edmontonians throughout all four seasons.

River Access Strategy

This strategy is a 10-year plan to inform future programming, operations, and infrastructure improvements that support access to the river and activities associated with the river. Currently underway, the plan will define locations, regulations, and use guidelines for development of river-based amenities. The expected completion date for this project is the fall of 2016.

Various Parks and Community / Recreation Projects

There are currently a number of parks and community / recreation projects underway in concept, design, and build phases. The following is a list of these projects according to which phase of development they're in.

CONCEPT PHASE

» Argyll Park
» Dawson Park Master Plan
» Kinsmen Sports Centre Master Plan
» Londonderry Athletic Park Renewal
» Mill Woods Recreation Centre Master Plan

DESIGN PHASE

» Buena Vista / Sir Wilfrid Laurier Park Master Plan
» Coronation Park & Community Recreation Centre
» Dermott District Park Renewal
» Johnny Bright Sports Park Development
» Lewis Farms Facility and Park
» Louise McKinney Riverfront Park – Urban Beach
» Queen Elizabeth Park Master Plan Implementation
» Whitemud Equine Centre Redevelopment
» William Hawrelak Park Water Play Feature

BUILD PHASE

» Borden Natural Swim Experience
» Buena Vista / Sir Wilfrid Laurier Park Master Plan
» Ivor Dent Sports Park
» Mill Woods Sports Park Pavilion
» Queen Elizabeth Park Master Plan Implementation
» River Valley Park System – Wayfinding Signs for Parks & Trails

River Valley Alliance Projects

» **Boat Launches:** The building or refurbishing of seven docks, two hand launches, and one vehicle launch to allow for greater public access to the river and reinforce the river as a connection to other parts of the region.

» **East End Trails:** An addition of 16 kilometres of trails to the river valley in east Edmonton.

» **West End Trails:** The addition of approximately 5 kilometres of primary (paved) and secondary (gravel) trails to the river valley main trail.

» **River access:** Two projects designed to aid Edmontonians to access the river valley, including the Touch the Water Promenade (on the north side of the river, near the new Walterdale Bridge) and the River Valley Funicular (connecting 100 Street to the river valley trail system near the Low Level Bridge and to be completed by the fall of 2017).

» **Terwillegar Park Footbridge:** A new 262 metre long footbridge to link Terwillegar Park in the southwest to River Valley Oleskiw on the north side of the river. Scheduled to be completed in the fall of 2016.

1. BORDEN NATURAL SWIM EXPERIENCE

Rendering of the Borden Natural Swim Experience as part of the Borden Park Revitalization Plan.

Source: edmonton.ca
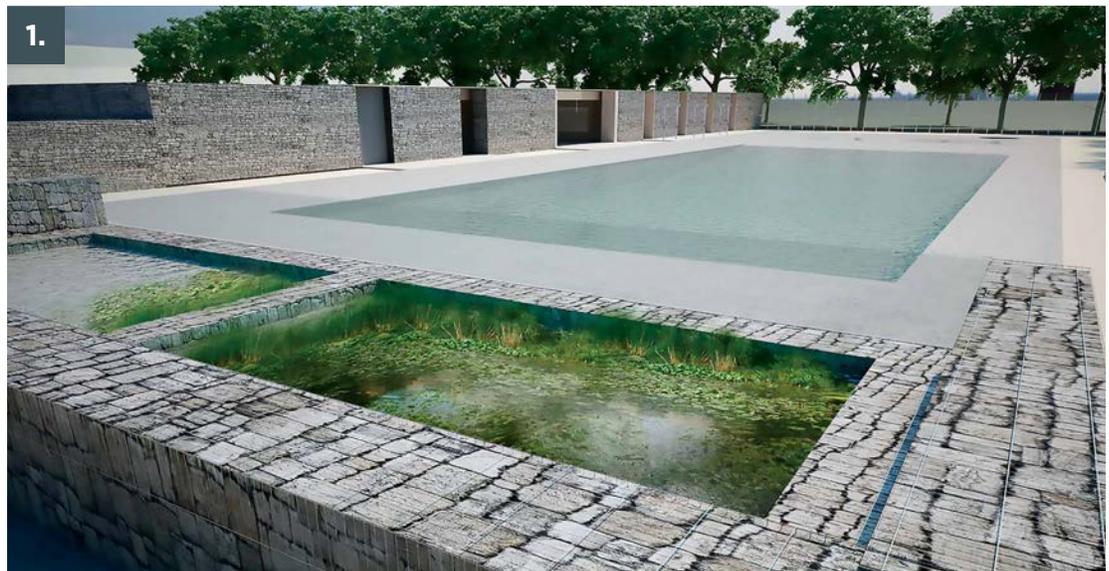
2. TERWILLEGAR FOOTBRIDGE

Rendering of the footbridge currently under construction across the North Saskatchewan River.

Source: edmonton.ca

Relevant Funding Streams & Mechanisms

The following is an overview of programs that are available specifically to fund recreation-related projects and operational costs.

Provincial Funding Sources

» **Community Facility Enhancement Programs (CFEP)** provides financial assistance for the expansion and upgrading of Alberta's extensive network of community-use facilities. Provides matching grants to Indian Band, Metis Settlements, and registered community non-profit groups to build, purchase, repair, renovate, or otherwise improve related family and community wellness facilities.

» **Community Initiatives Program (CIP)** supports project-based initiatives in areas such as community services, seniors' services, libraries, arts and culture, sports, education, and health and recreation. Maximum grant is $75,000 per project per year; funding is approved on a matching grant (met by financial contribution, volunteer labours, services, or donated materials or equipment) basis.

» **Alberta Active Living Grant** provides funding to assist Alberta Active Living Partners organizations and Alberta TrailNet Society with annual operating and programming costs.

» **Organizational Support Grant** provides assistance to recreational organizations for programs, operations, leadership, and volunteer development.

» **Recreation and Physical Activity Project Grant** supports projects that foster cooperation, innovation, and research in recreation and physical activity programming.

» **Recreation and Physical Activity Project Micro Grants** are project grants for up to $25,000 awarded in a competitive assessment process.

City of Edmonton Funding

» **Community Facility Partner Capital Grant Program (CFPCG)** supports partnerships that enhance public use facilities.

» **Community League Infrastructure Program (CLIP)** provides funding assistance to community leagues for capital costs to preserve and enhance existing facilities or for construction of new facilities that provide an overall benefit to the community and value to the citizens of Edmonton. Applicants must meet all terms and conditions of Policy C502A.

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhood play, wellness, and learning through active partnerships with the community.

Other Funding Sources

» **Alberta Recreation and Parks Association - Participation Teen Challenge**, sponsored by Coca-Cola Canada, aims to help teens become more active through grants of up to $500 that break down barriers to get teens "moving."

» **Alberta Sport Connection**

  • Above & Beyond Grant provides support to coaches and officials to pursue educational or developmental opportunities.

  • Event Support Program focuses on sport program development, providing financial support to communities and associations in hosting major sport events.

» **Canadian Tire Jumpstart Program**, a community-based charitable program that helps kids across the nation in financial need participate in organized sport and recreation.

» **Evergreen Grants** is a leading funder of nation-wide community and school greening projects, and provides training, design, maintenance advice, and a range of resources.

» **KidSport Alberta Chapter Provincial Funding** is a national not-for-profit that provides financial assistance for registration fees and equipment to kids aged 18 and under.

3. FLEXIBLE SPACES

Open fields and other areas provide flexible open space for a variety of activities and leisure.

Source: City of Edmonton

4. MULTI-SEASONAL SPACES

The plaza at City Hall provides opportunities for multi-seasonal activities, like skating in the winter and a wading pool in the summer.

Source: venuejar.com
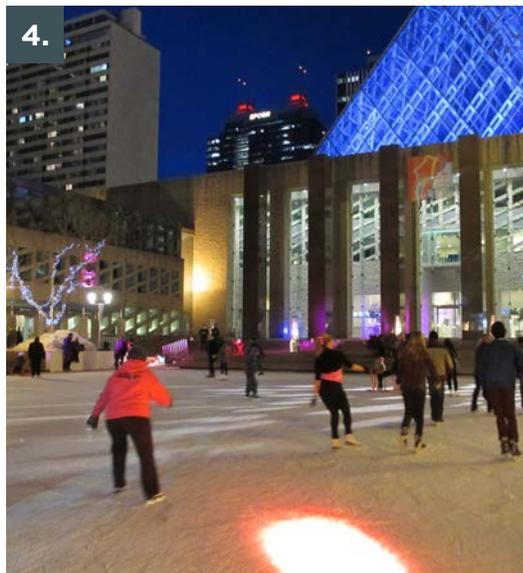
5. ACCESSIBLE SPACES

Level walking paths are important for accessibility for the people with mobility challenges.

Source: City of Edmonton

Best Practices & Trends

In recent years, several best practices and trends in the recreational industry have developed, such that these spaces and the approach to creating recreation amenities incorporate the following concepts:

» Multi-use, integrated facilities that share common infrastructure (such as irrigation, lighting, and drainage systems, as well as parking areas) to improve efficiency.

» Flexible spaces that can accommodate different uses and respond to changing preferences or trends.

» Cross-programming opportunities – something for everyone – to provide a one-stop recreation location for a range of user groups and help alleviate the common challenge of "too little time" for recreation.

» Decentralized, neighbourhood-based facility model that can celebrate and respond to the local and unique needs and strengths of each community, as well as improve convenience, and therefore accessibility. Neighbourhood recreation facilities and spaces can help create community identity, acting as focal points and anchors for a neighbourhood.

» Multi-seasonal opportunities that encourage activities throughout the year. These can be formal or informal facilities or programming that position the park as a year-round destination. An important component to multi-seasonal parks is careful, considerate design to mitigate climate extremes and encourage year-round use.

» Engage the community and users in the design and programming of spaces to ensure they are reflective and responsive to the community's needs, as well as instill a sense of ownership of the open space in the public. This is particularly relevant in the renovation or reinvestment in parks and open space as there is likely already a solid base of users or residents that understand the space's deficiencies.

» Create accessible spaces for all ages and abilities, with attention to design detail spaces can be designed to accommodate use by those of all ages, ability, and from any background.

Precedents

The precedents identified below are just a few of the numerous examples of recreation amenities in cities across the world.

Beltline Trail | Toronto, ON

This trail is a 9 kilometre cycling and walking route in Toronto along a reclaimed railway line. Comprised of three sections – the York Beltline Trail, the Kay Gardner Beltline Park, and the Ravine Beltline Trail – this trail provides an excellent opportunity not only for recreation, but for commuters to enjoy a safe and enjoyable route on foot or bicycle. For many who would prefer off-street bicycling or jogging (or in other cases, skating or cross-country skiing), linear parks are a key (and often overlooked) component to promoting physical activity and recreation in cities.

Hayes Valley Playground | San Francisco, CA

The redevelopment of this inner-city playground in 2011 was an exercise in engagement over a 6-month design process with community members, resulting in a handful of park features (a 2,500 sf clubhouse, play areas for school-aged children and tots, a stage and plaza for community gatherings, outdoor fitness equipment for adults, and community garden plots) that respond directly to the local residents' needs. Furthermore, the new park design also incorporates sustainable design features, such as a living roof on the clubhouse, water-saving drought-tolerant plants, recycled denim insulation, and solar panels for radiant floor heating.

6.

7.
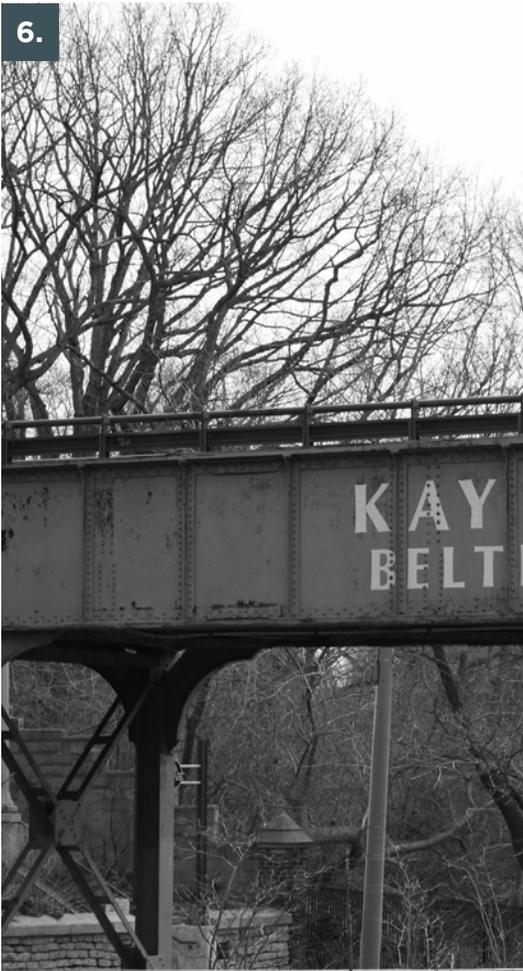
6. BELTLINE TRAIL

This bridge crossing over Yonge Street is just a portion of the Beltline Trail that runs through Toronto.

Source: Danielle Scott via Wikimedia

7. HAYES VALLEY PLAYGROUND

This playground in San Francisco was developed through a community design process that responded directly to locals' needs.

Source: Project for Public Spaces (pps.org)

Rundle Park | Edmonton, AB

Built on Edmonton's first landfill, Rundle Park now provides access to the North Saskatchewan River as well as a pedestrian connection across the river to Gold Bar Park. Located in the northeast part of the river valley, this park is one of the city's most well-known parks with a diverse range of recreation amenities and activities, including beach volleyball, disc golf, a paddling centre, mini golf, ice skating and shinny ponds, cross-country ski trails, etc.

Theodore Wirth Regional Park / Wirth Winter Recreation Area | Minneapolis, MN

Not too far from downtown Minneapolis, this large regional park is on the western side of the city. Not only does this park have a range of activities for summer, but it has also been specifically designed and marketed as the "Wirth Winter Recreation Area" in the winter, providing cross-country ski trails, snowboarding, snowshoeing, sledding, tubing, ice fishing, and ice rinks. Additionally, this park hosts an annual urban cross country ski festival, the City of Lakes Loppet Ski Festival.

8. RUNDLE PARK FOUNTAIN

This park in Edmonton is one example of the city's great recreational spaces that provides a variety of activities for all seasons.

Source: Wikipedia

9. WINTER IN WIRTH WINTER RECREATION AREA

This park in Minneapolis has an extensive cross-country skiing trail system that provide a perfect open space outlet for city residents throughout the winter.

Source: Minneapolis Star Tribune
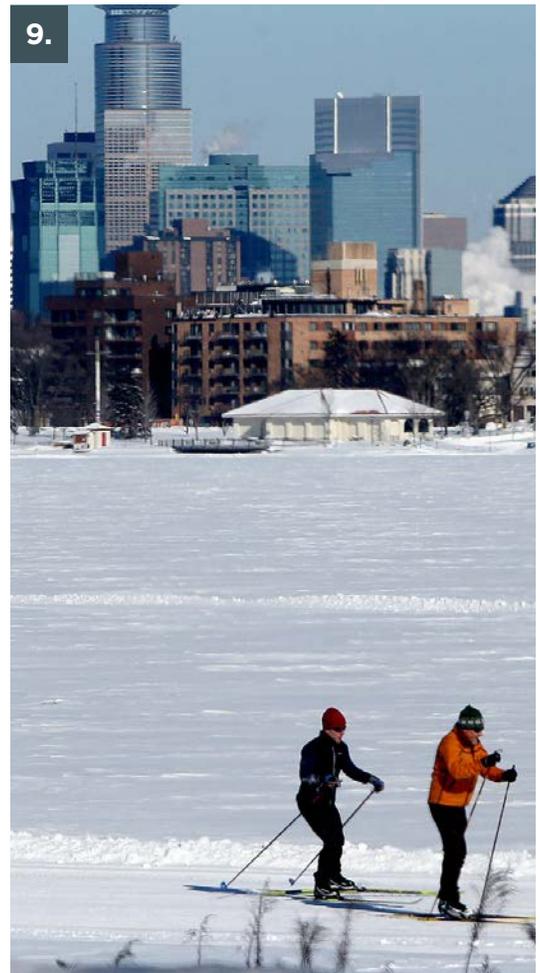
Active Transportation

The inclusion of well-connected, high quality trails and pathways within the green network is key to promoting and encouraging active transportation modes, improving residents' health, improving overall mobility, reducing carbon emission, and alleviating general demand on vehicular transportation networks.

Key External Stakeholders / Organizations

Active transportation means non-motorized types of transportation, and includes bicycling, walking, running, skateboarding, cross-country skiing, snowshoeing and other types of locomotion. Given that active transportation commuters generally use the same infrastructure as recreational users, this sections incorporates all types of active living stakeholder groups. Stakeholder groups that could be interested and invested in the green network and how it could be used for active transportation are identified below.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how active transportation, including infrastructure (such as bicycle lanes) and programming, is developed and planned for within Edmonton's Green Network.

Alberta Bicycle Association

Alberta Culture and Tourism

Alberta Environment and Parks (AEP)

Alberta Health Services (AHS)

Alberta Public Health Association (APHA)

Alberta Recreation & Parks Association

Canada Walks

Canadian Coalition for Public Health in the 21st Century

Canadian Fitness and Lifestyle Research Institute

DirtGirls (Women's Mountain Bike Club)

Edmonton Bicycle & Touring Club

Edmonton Bicycle Commuters' Society

Edmonton BMX

Edmonton Masters Cycling Club

Edmonton Mountain Bike Alliance

Edmonton Road and Track Club

Edmonton Running Club

Make Something Edmonton

Mountain Equipment Co-op

Pan-Canadian Public Health Network

Prescription to Get Active

Public Health Agency of Canada

River City Runners

Trails, Paths, and Routes Advisory Committee (TPRAC)

UWALK

Edmonton Bicycle Blogs:

» girlsandbicycles.ca
» loopframelove.com
» tuckamoredew.wordpress.com
» breakingchainstakinglanes.wordpress.com
» Critical Lass Edmonton (facebook group/events)

Relevant Plans & Policies

The bulk of the policy regarding active transportation is focused on the regulation of bicycles and bicycle use through highway and roadway regulation at the federal and provincial level; very few regulations pertain to other forms of active transportation, such as walking or skiing. However, there are several plans at the local level that focus on active transportation specifically. The plans and policies summarized below highlight some of the major goal and directions for active transportation in the city.

Transportation Strategy for Alberta (Draft)

Currently under development, Connecting Albertans with Each Other and the World: A Long-Term Transportation Strategy for Alberta envisions an integrated, cost-efficient, multi-modal transportation system that is safe, affordable and accessible to all Albertans. The six draft goals of the Strategy address the provision of active transportation through access to a variety of transportation modes, providing active transportation options to support a high quality of life, connecting communities with public transportation (which encourages active transportation to and from transit stops) and incorporating environmental stewardship into transportation planning (including transportation demand management). Suggested actions include collaborating with partners to perform a needs assessment in all Alberta communities; implementing best practices for integrating active transportation with public transit; developing multi-use trails; securing predictable funding; and encouraging municipalities to implement appropriate processes and infrastructure to meet active transportation needs in their communities. The Ministry of Transportation seeks to incorporate additional government direction and engagement with transportation stakeholders during 2016 before finalizing the Strategy.

Traffic and Transit Related Regulations

Both provincial legislation and City of Edmonton Bylaws regulate bicycle use through laws regarding rules of the road, vehicle safety, and appropriate use of transit.

» **Alberta Regulation 304/2002** regulates the use of highways and identifies the rules of the road for the Province. While bicycles are not motor vehicles, it is important to note that rules of the road apply to all vehicles (as opposed to just motor vehicles), including bicycles. Additionally, there are several laws that apply specifically to bicycles, including the operation of bicycles on roadways and the use of bicycle lights, among other regulations.

» **Alberta Regulation 122/2009** regulates vehicles' equipment, including specific requirements that cyclists must have at least one cycle light and a horn or bell, cyclists must wear a helmet, and other bicycle equipment requirements.

» **Alberta Traffic Safety Act** and its associated regulations govern cyclists' use of highways in Alberta.

» **Edmonton Zoning Bylaw 12800, section 54.3** addresses bicycle parking and the type of rack that may be used, including design standards, and bicycle parking requirements for building or site use.

» **City of Edmonton Bylaw 5590: Traffic Bylaw** regulates the use of highways under the direction, control, and management of the City, as well as regulating the parking of vehicles on highways and on privately owned property. Bicycles are permitted on all highways in Edmonton, including roads on private property that normally permit public use for passage or parking. This bylaw includes policy regarding bicycling on sidewalks, use of crosswalks, and yielding to pedestrians, among other regulations.

» **City of Edmonton Bylaw C8353: Conduct of Transit Passengers** regulates the conduct and activities of people using the Edmonton Transit System, in order to promote transit riders' safety and welfare. This bylaw includes policy that regulates the protocol for transporting bicycles on transit vehicles, as well as hours for bicycles on LRT and bus routes with bicycle racks.

Active Transportation Policy C544 (2009)

This policy states that the City supports all forms of active transportation by providing infrastructure, facilities, programs, and initiatives to:

» Enhance accessibility, safety, security, and convenience through strategic improvement, expansion, and maintenance of the infrastructure and facilities that support Active Transportation, including sidewalks, curb ramps, shared pathways, marked bicycle and shared-use lanes, and end-of-trip facilities.

» Raise awareness of the Active Transportation options available to Edmonton's citizens and the benefits of active, healthy living, recreation, and sustainable communities, through special events and promotions.

» Educate users of Edmonton's transportation systems about their rights and responsibilities, including drivers, cyclists, and pedestrians, through targeted outreach and educational campaigns.

» Enact bylaws, policies, procedures, directives, strategic plans, processes, programs, and guidelines to support and encourage Active Transportation modes.

» Share responsibility for the provision of infrastructure, facilities, programs, and initiatives to support and encourage Active Transportation through collaboration, cooperation, and partnerships.

Bicycle Transportation Plan (2009)

The Plan envisions a bicycle friendly city by creating a functional, comprehensive network of bicycle routes. In coordination with the The Way We Move: Edmonton's Transportation Master Plan, this document promotes healthy and active lifestyles by planning for appropriate cycling infrastructure that can support year-round cycling and encourage people to choose cycling as a safe, healthy, and efficient alternative to driving. It identifies specific roads that are important for establishing a city-wide integrated bicycle network, and provides guidance for:

» Marked on-street bike routes;

» Expansion of bicycle racks to all transit buses;

» An expanded bicycle parking program;

» Education and awareness needs;

» Improved maintenance schedule; and

» Street sweeping and snow clearing / removal.

This document will be helpful in determining the City's future plans for its bicycle network and how improvements might be integrated with the green network.

Edmonton Complete Streets Guidelines (2013)

These Guidelines were developed as part of the implementation strategy for Edmonton's Transportation Master Plan. Complete streets are "safe, comfortable, and convenient for travel for everyone, regardless of age or ability – motorists, pedestrians, bicyclists, and public transportation riders." As such, the Complete Streets Guidelines are intended to:

» Provide design guidance for new and rehabilitation road transportation projects.

» Accommodate the needs of all users (i.e. pedestrians, bicyclists, transit and transit riders, goods and service vehicles, and automobiles, among others).

» Provide innovative street builders with political and community support for doing things differently.

» Shift from a rigid design standard to a flexible approach acknowledging that "one size does not fit all" and the design of individual streets should reflect the local context, land uses, and types of users.

» Be efficient as possible with space.

» Acknowledge that Edmonton's existing street design generally provides complete streets as-is in many situations, but additional guidance is needed for missing network pieces.

» Work towards improving the aesthetics of roadways in the right contexts.

This document will be useful in determining appropriate standards and guidelines for open space edge conditions as well as connections to Edmonton's pedestrian, cycling, and transit networks.

Proposed Walkability Strategy Project (2009)

This project guides the work of improving walkability across Edmonton. Completed in 2009, this document (along with the Sidewalk Strategy, and Bicycle Transportation Plan Update) is a key step to supporting and encouraging active transportation in Edmonton. This document serves three main purposes:

1. Provide a summary of walkability (what it is, what it achieves, what is needed to support it) as well as an introduction and consistent definition of what is meant by "walkability."

2. Objectively review City of Edmonton planning, design, education, and funding practices as they relate to and impact the ability of Edmonton's residents to walk for commuting, education, and shopping purposes.

3. Create a recommended Action Plan of programs and initiatives that should be undertaken by City Departments to increase the number and proportion of trips that people make by walking.

This document will be useful for illustrating some of the major barriers (and solutions) to walkability in Edmonton, and help define the role and some of the approaches that the green network can have in improving Edmonton's overall walkability.

River Valley Alliance Plan of Action

Although discussed in more detail in the Biodiversity Brief, the Plan of Action is relevant to planning for active transportation in the open space network. The Plan establishes social, environmental and economic objectives for the entire river valley, including the use of trailways and waterways to connect communities and attractions along the valley, and supporting an active and healthy lifestyle for people in the Capital Region.

Relevant Projects & Programs Underway

There are a number of city projects underway that revolve around active transportation, including cycling infrastructure, walking routes and programs, and wayfinding. The following is a brief overview of some of these projects.

School Travel Plan

This active transportation program encourages children to choose walking and cycling as their primary way to travel to and from school. School Travel Plan is developed by SHAPE Alberta (Safe Healthy Active People Everywhere) in coordination with the City of Edmonton and multiple stakeholders, including candidate schools and their dedicated volunteers.

Wayfinding Project

This project is being developed as a part of Walk Edmonton to create a comprehensive wayfinding system of maps, digital applications, and signs for central areas of the city to support people who travel on foot, by bicycle, or by transit. This project is near completion (though not yet built), and has so far established the Edmonton Design Standard for Wayfinding, detailed corridor plans for wayfinding signage in primary pedestrian areas, and a concept plan for signage and mapping of the pedway network. Background work for this project also includes an audit of existing wayfinding conditions.

Walterdale Bridge

Walterdale Bridge currently spans the North Saskatchewan River, connecting the intersection of Queen Elizabeth Park Road and Waterdale Hill to the intersection of River Valley Road/Rossdale Road/105 Street on the north side of the river. After having served the city for a hundred years, this bridge is in the process of being replaced, with an expected completion date of 2017. The new bridge will have an attached, but separated, pedestrian and cyclist pathway.

River Valley Park System Wayfinding

Wayfinding signage for the River Valley park system is currently in the build phase, with all new signs being built to assist park and trail users to find their way around the River Valley Park System.

Bike Route Projects

» **Engage 40 Avenue** (between 106 St. and 120 St.) is a collector road that serves five neighbourhoods: Rideau Park, Duggan, Greenfield, Aspen Gardens, and Royal Gardens. This project identifies how and where bike routes should be located and designed to reflect local needs.

» **83 Avenue Bike Route** (Strathcona) is a one of two major bike routes currently being planned in the central part of Edmonton. This route will connect the communities of Strathcona, Garneau, and the University area (between Mill Creek Ravine and 111 Street). Main destinations in this route include: the University of Alberta, Faculté Saint-Jean, Mill Creek Ravine, and Old Strathcona Farmers' Market, as well as shopping areas, attractions, and festivals.

» **102 Avenue Bike Route** (Downtown) is the second major bike route being planned in central Edmonton. This route will connect the communities of Downtown, Oliver, and Glenora (between 96 St. and 136 St.), linking destinations that include Stanley Milner Library, City Hall, Winspear Centre, Alberta Art Gallery, City Market (104 Street), and the 124 Street and High Street shopping areas.

River Valley Alliance Projects

» **East End Trails**: An addition of 16 kilometres of trails to the river valley in east Edmonton.

» **West End Trails:** An addition of approximately 5 kilometres of primary (paved) and secondary (gravel) trails to the river valley main trail.

» **Terwillegar Park Footbridge:** A new 262 metre long footbridge to link Terwillegar Park in the southwest to River Valley Oleskiw on the north side of the river. Scheduled to be completed in the fall of 2016.

Relevant Funding Streams & Mechanisms

Active transportation infrastructure is typically extremely under-funded compared to what is spent on infrastructure for vehicles. According to the Bicycle Transportation Plan, sidewalks and bicycle infrastructure represents approximately 0.20% of the City's capital budget and less than 1% of the former Transportation Department's capital budget for roads. Below is a brief overview of some the sources for funding for active transportation projects and operations.

Federal Funding Sources

» **Infrastructure Canada: New Building Canada Fund (NBCF)** is one component of the overall New Building Canada Plan (NBCP) to support projects that promote economic growth, job creation, and productivity. This fund encourages investments in infrastructure projects that have broad public benefits, and that contribute to long-term economic growth and prosperity.

» **Infrastructure Canada: The Federal Gas Tax Fund** provides funding for a wide range of local infrastructure projects, including public transit, wastewater infrastructure, drinking water, solid waste management, community energy systems, local roads and bridges, capacity building, highways, airports, rail lines, short-sea shipping, disaster mitigation, broadband and connectivity, brownfield redevelopment, culture, tourism, sport, and recreation.

» **Infrastructure Canada: National Recreational Trails Program** is a partnership between the Government of Canada and the National Trails Coalition (NTC) to provide funding to expand and improve multi-purpose trails for walking, running, cross-country skiing, biking, all-terrain vehicle use, and snowmobiling.

» **Environment Canada: EcoAction Community Funding Program** provides financial support to community-based, non-profit organizations for projects that have measurable, positive impacts on the environment. The program supports projects that address the four following themes: clean air, clean water, climate change, and nature.

Provincial Funding Sources

» **Alberta Lottery Fund** is funded by the government's share of net revenue of video lottery terminals, slot machines, and ticket lotteries. This fund is used to support thousands of volunteer, public, and community-based initiatives annually.

» **Alberta Transportation: Green Transit Incentives Program (GreenTRIP)** supports public transit projects, such as buses, park-and-ride facilities, and LRT systems. Funded projects support public transit that is safe, affordable, accessible, and an environmentally sustainable transportation option.

» **Alberta Transportation: Strategic Transportation Infrastructure Program (STIP)** provides financial assistance to municipalities for developing and maintaining key transportation infrastructure to promote economic growth and improve mobility through strategic, project-specific investment in capital construction and rehabilitation of important local transportation infrastructure.

» **Municipal Sustainability Initiative (MSI)** provides municipalities with sustainable funding to assist them in meeting the challenges of growth and enhancing their long-term sustainability.

City of Edmonton Funding

» **City of Edmonton Community Investment Operating Grant** program provides operating assistance to Edmonton non-profit organizations whose activities benefit citizens of Edmonton with regards to social services, intercultural relations, or recreation/sport/leisure, including athletic, physical, historical, natural science, cultural, social and intellectual activities.

Best Practices & Trends

There are a number of best practices and general guidelines for bicycle and active transportation infrastructure, including documents by the City of Edmonton. The best practices and trends highlighted below provide an overview of the key elements to ensuring a cohesive and successful active transportation network.

Bike Share Systems

Of late, cities and towns across the world have been developing bike share programs, as an effective tool for both city residents and tourists to not only experience and explore, but to also provide access from communities and neighbourhoods to central transit hubs, parks, commercial or civic centres, and workplaces. Frequently bike share facilities – bicycle locations – are strategically (and conveniently) placed near major park entrances or adjacent to major bicycle routes. Bike share systems also generally go a long way to promoting cycling as a way to get around and access parks.

1. BIKE SHARE

A docking station for the Capital Bikeshare system that serves Washington, D.C. The service has more than 300 stations and 2,500 bicycles.

Source: Mario Roberto Duran Ortiz via Wikimedia

Bicycle Infrastructure

There is a variety of bicycle infrastructure that promotes bicycle use for both recreational and commuting purposes, by creating a comprehensive, linked bicycle network. The following is a brief overview of the primary components to encouraging bicycle use as active transportation.

» **Bicycle Boulevards** are low-traffic streets that are optimized for use by cyclists through: traffic calming elements, signage, bicycle signage, as well as the reduction of stop controls for cyclists.

» **Bicycle Lanes and Boxes** provide dedicated space in the street for cyclists, and help improve driver awareness.

» **Cycle Tracks** are bicycle lanes that are physically separated from traffic, but located in the roadway, providing a much greater level of comfort and sense of protection for cyclists.

» **Integration of Bicycles and Transit** consists of two major components: (1) external or onboard bicycle racks for transit of bicycles, and (2) high capacity, and weather-protected bicycle racks or lockers.

» **Strategic Bicycle Parking** in areas of high use, such as commercial nodes, civic centres, transit stops, ensures convenient, secure, plentiful, and if possible, weather-protected bicycle parking to encourage bicycle use.

» **End-of-trip Facilities** can include sheltered bicycle storage, showers / washrooms, and lockers, all of which are key components to promoting bicycle use and commutes in all types of weather.

2. SHARROWS

These markings in Chicago remind drivers that cyclists are sharing the road.

Source: Michelle Stenzel via Bike Walk Lincoln Park

3. CYCLE TRACK

This cycle track, part of the Indianapolis Cultural Trail, protects cyclists from other traffic.

Source: Bike OKC

4. BIKE SHELTER

This bike shelter in Columbus, Ohio encourages cycling as a convenient means of commute.

Source: Designing Local

5. BIKE LOCKERS

These lockers in Portland, OR allow for safe storage of bikes.

Source: TriMet via bikeportland.org

Greenways, Linear Parks, Green Corridors

Greenways, linear parks, and green corridors are some of the main names for a pathway embedded in a linear open space, often buffered from adjacent development or roadways by vegetation. Frequently, built on former railroad routes, these are spaces excellent conduits to active transportation, because people can walk, cycle, run, and skate (for the most part) uninterrupted for much longer than if it was on-street infrastructure. This trend of converting abandoned railways and restoring lost right-of-ways has been gaining popularity in the past couple of decades, with results that can both transform neighbourhoods and improve the overall connectivity of the city, and the city's open spaces.

Complete Streets

The notion of "complete streets" has become a more common goal in recent years, with communities and cities aiming to create corridors that promote walkability and bicycle use through the development a complete streets. Complete streets are streets designed for everyone; inclusive streets that enable safe access for people of all ages and ability to walk, cycle, drive, or take transit. There are many components and varying descriptions of a "complete street," the City of Edmonton's Complete Street Guidelines may serve as a reference for this project, however the Complete Streets for Canada, as well as the National Complete Streets Coalition in the U.S., both have additional resources for designing and creating policy for accessible streets that promote active transportation.

6. BELTLINE TRAIL

This portion of the Beltline trail is highly vegetated, and an excellent example of a green corridor that facilitates active transportation.

Source: loozrboy via flickr.com

7. CAR FREE SUNDAYS AT GOLDEN GATE PARK

Roads in this major San Francisco park are closed down every Sunday, and for half the day on Saturdays to facilitate alternative modes of transportation to, and within, the park.

Source: sdgreatstreets.org

Precedents

Most active transportation precedents focus on on-street infrastructure, rather than the incorporation of pathways and networks through a green network. The precedents described below incorporate pathways and other key active transportation elements to promote and encourage active transportation modes not just within the park, but across the neighbourhood or city as a whole.

Grand Rounds Scenic Byway | Minneapolis, MN

Totaling approximately 1,890 hectares and more than 82 kilometres of walking and biking trails, the Grand Rounds is one of the longest continuous systems of public urban parkways in the U.S. Building from the city's extensive pedestrian pathway network from the 1930s, Minneapolis began adding bicycle infrastructure in the 1990s. Incorporating numerous parks and open spaces, the Grand Rounds Scenic Byway creates a green ring of recreation and active transportation opportunities that goes around and through the city. Not only does Minneapolis have this pedestrian and cyclist byway ringing the city, but it also has numerous additional pathways and greenways, including the notable Midtown Greenway and the Cedar Lake Regional Trail, all of which contribute to make Minneapolis one of the most active cities in the U.S.

Beltline Trail | Toronto, ON

This trail is a 9 kilometre cycling and walking route in Toronto along a reclaimed railway line. Comprised of three sections – the York Beltline Trail, the Kay Gardner Beltline Park, and the Ravine Beltline Trail – this trail provides an excellent opportunity not only for recreation, but for commuters to enjoy a safe and enjoyable route on foot or bicycle.

Car Free Sundays at Golden Gate Park | San Francisco, CA

Several years old now, this program essentially closes Golden Gate park to all vehicle traffic, enabling pedestrians, cyclists, rollerbladers, skaters, and runners complete access to the park's road network. This not only promotes active transportation within the park, but also encourages alternative modes of transit to the park, as parking capacity is limited. This program is so popular that it has expanded to include some Saturdays, and there is a push to close the park to vehicles for the entire weekend.

8. GROUND ROUNDS TRAIL SIGNAGE

This extensive trail network in Minneapolis creates a full circle around the city aiding the mobility of all user groups to access neighbourhoods, parks, shopping destinations via the trail, as well as simply use the loop for recreation.

Source: Michael Hicks via Wikimedia

Mental Health & Wellbeing

An important function of open space is its role in providing calm and therapy by reducing stress and providing opportunities for the disabled or elderly to engage in therapeutic activities such as gardening. Spending time in open spaces can also foster a connection with nature that promotes spiritual fulfilment.

Key External Stakeholders / Organizations

Over the past couple of decades, partnerships between parks and recreation and the health community have substantially grown, largely in response to physical activity as a means of addressing the impacts of increasingly common sedentary lifestyles. Programs like Alberta's "Prescriptions to Get Active" are underway across the world as a means of promoting physical activity as a preventative health care tool. However, less formally developed is the relationship between open spaces (i.e. nature) and mental health, as a method of physical or mental therapy, as well as a stress reducer. The following is a list of stakeholders, some of which may already be invested with strong social ties to parks and recreation in the city, and others with which the relationship would need to be built and fostered.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can benefit public health and the overall wellbeing of the city's residents.

Alberta Centre for Active Living

Alberta Environment and Parks (AEP)

Alberta Health Services (AHS)

APPLE Schools: Alberta Project Promoting Active Living & Healthy Eating

Alberta Public Health Association (APHA)

Alberta Recreation & Parks Association

Boys and Girls Clubs of Canada (Western Region)

Building Communities That Create Health

Canada Sport for Life

Canada Walks

Canadian Coalition for Public Health in the 21st Century

Canadian Fitness and Lifestyle Research Institute

Canadian Parks and Wilderness Society (CPAWS) – Northern Alberta Chapter

Canadian Public Health Association

Child and Nature Alliance of Canada

Edmonton Horticultural Society

Edmonton Nature Club

Edmonton Outdoor Group (Meetup Group)

Edmonton Sport Council

Ever Active Schools

Health & Physical Education Council – The Alberta Teachers' Association

Healthy U (Province of Alberta)

Mental Health Commission of Canada

Nature Alberta

Pan-Canadian Joint Consortium for School Health

Pan-Canadian Public Health Network

Prescription to Get Active – Edmonton Primary Care Networks (PCNs)

Public Health Agency of Canada

River Valley Alliance

Show Up and Play Sports Edmonton (Meetup Group)

The Edmonton Hiking/Walking (Meetup Group)

The Sierra Club

Relevant Plans & Policies

There is a substantial amount of health legislation (over 30 laws and 100 schedules of regulations, rules, standards, and bylaws), but there is limited reference to the importance of nature and open spaces in affecting residents' mental health and wellbeing. For the most part, this relationship between the built environment (including a community's green network) and public health is explored in strategic planning documents at the provincial and national level. Given that the Province is the primary agent in providing and managing health for Albertans, the bulk of health related plans and policies are at the provincial level. The documents identified below represent the most relevant plans, policies, and trends related to planning for individuals' and communities' mental health and wellbeing through the green network. It should be noted that the green network impacts mental health and wellbeing in ways that extend beyond therapy and stress relief, such as spiritual, emotional or social fulfilment, but that may not be addressed in space or health planning documents.

Active Alberta Policy 2011-2021

This policy sets the direction for maximizing the effectiveness of provincial investments in sport, recreation, and active living projects and programs. As such, this document identifies Provincial priorities and initiatives, and challenges partners to design programs and deliver services that encourage Albertans to become more active. This document will be useful for understanding the approach the Province is currently taking to promote active living, and what is expected of the City to facilitate and promote this initiative.

Aging in Place Study (2007)

This study examines the needs of Edmonton's seniors related to aging in place. The document provides an overview of the main challenges to aging in place as well as the trends and demographics of seniors in Edmonton. Additionally, following this study, Edmonton held an Aging in Place workshop with community stakeholders, and has since launched several Aging in Place Community Demonstration Projects.

Aging Population Policy Framework (2010)

The Framework is a step towards a coordinated and aligned approach across Alberta to develop policies, programs, and services that meet the changing needs of an aging population. The framework highlights several key roles of municipalities in planning for an aging population:

» Ensure the safety and security of Albertans in their communities as they age.

» Enable Albertans to easily connect with and access municipal programs as they age.

» Develop and sustain age-friendly environments in their communities including municipal transportation systems, facilities, infrastructure, public spaces, and land use.

» Work with other community partners to encourage the creation of age-friendly developments and facilities, including a variety of housing options.

» Encourage and promote a culture of inclusiveness that engages and involves Albertans in their communities as they age.

» Educate local businesses, organizations, and service providers about the changing needs of Albertans as they age, and encourage them to adapt to these changing needs.

» Identify and respond to local needs and priorities of senior Albertans in their communities.

The Integrated Pan-Canadian Healthy Living Strategy (2005)

The Healthy Living Strategy provides a conceptual framework that aspires to a future where all Canadians experience the conditions that support the attainment of good health. The framework focuses on preventative care and promoting good health through the alignment of different sectors and coordination of work efforts to address common risk factors, such as physical inactivity and unhealthy eating. This document highlights some of the federal government's key targets and goals for healthy living in Canada that could be considered in the development of the green network.

Seniors' Centres Plan 2011-2021

This Plan provides direction on the capital requirements of existing seniors' centres and recommendations to address seniors' needs for new facilities. Building upon the previous work completed in the 2007 Seniors' Centres Long-term Funding Strategy, this document provides: a review of existing seniors' centres: a summary of proposed future capital improvements to existing centres; an analysis of seniors' needs in areas of the city without a seniors' centre; and recommendations related to potential future capital requirements related to centres and services for older adults.

Seniors' centres are, for the most part, indoor facilities requiring a high level of service and investment. According to the City of Edmonton's Seniors' Centres Long-Term Funding Strategy (2007-2017), a seniors' centre is a public facility that:

» Is operated by a non-profit organization;

» Is targeted to people that are 55 and older;

» Has regular hours of operation;

» Offers a diverse range of programs, services, and activities that take place or originate from a facility built or designed to meet the needs of seniors; and

» Is accessible to all seniors.

Furthermore, the City of Edmonton has determined that seniors' centres have a service radius ranging from 1.5 kilometres (Type 2 – neighbourhood membership) to 6 kilometres (Type 5 – city-wide membership). For many seniors, 1.5 kilometres might still be too far for those without vehicle access, or those with disabilities. The green network and senior-specific open spaces have the opportunity to fill this gap, by providing both therapeutic and recreational spaces that enable aging in place. The Green Network Strategy can use this document to help identify areas within the city where open spaces for mental health and wellbeing may be most needed, i.e. gaps in existing and planned seniors' centre catchments, and areas with a concentrated population of seniors.

Alberta's Strategic Approach to Wellness (2013)

This policy was developed following a recommendation in the 2010 document – Becoming the Best: Alberta's 5-Year Health Action Plan – to create healthier social and physical environments. This document identifies five strategies to create healthier social and physical environments:

» Improve the health knowledge, skills, and behaviours of individuals and families.

» Build communities that create wellness.

» Improve social and economic supports for wellness.

» Strengthen primary prevention with primary health care.

» Build healthy public policy.

Additionally, this document outlines the roles and responsibilities of individuals, families, non-governmental organizations, businesses, and governments in contributing to Albertans' health and wellness. Throughout the project process, this document will be useful for ensuring that the Green Network Strategy aligns with provincial policy. Finally, the Appendix of this document illustrates several key factors that affect residents' health and wellness, including early childhood development, education and learning, employment and working conditions, food security, housing, built environment, income, safety and security, natural environment, and social supports. Consideration of these factors in the development of the Green Network Strategy and assessment of the city's open space will help ensure that the green network maximizes its mental health and wellness capacity.

Creating Connections: Alberta's Addiction and Mental Health Strategy (2011)

Creating Connections is based on an understanding that addiction, mental health problems, and mental illness are caused by a complex interplay of genetic, biological, personality, and environmental factors, and is intended to transform the addiction and mental health system. The goal of this document is to reduce the prevalence of addiction, mental health problems, and mental illnesses in Alberta through health promotion and prevention activities, and by providing quality assessment, treatment, and support services. There are five strategic directions highlighted in this document, including:

» Build healthy and resilient communities.

» Foster the development of healthy children, youth, and families (includes seniors).

» Enhance community-based services, capacity, and supports.

» Address complex needs.

» Enhance assurance.

This document will be useful in identifying the opportunities for the Green Network Strategy to integrate with the Province's policy direction with regards to mental health, and the role that open spaces and the built environment have in mental health.

Pan-Canadian Physical Activity Strategy (2004)

The Strategy was created by the Coalition for Active Living – a national action group of over 40 organizations – and funded by the Physical Activity Contribution Program of Health Canada. It is meant to implement a comprehensive, national, integrated, and collaborative strategy to promote health through increasing the physical activity levels of all Canadians, with a short-to-mid term target of 10% increase in each province and territory by 2010. While the original lifespan of this strategy has passed, the document's set of strategic priorities and recommendations may be useful for informing the development of the Green Network Strategy and promoting physical activity within the green network.

Vision for an Age Friendly Edmonton Action Plan (2011)

This Plan, facilitated by the Edmonton Seniors Coordinating Council, is part of a larger initiative to build a city that values, respects and actively supports the wellbeing of seniors. That initiative is the result of Edmonton's joining the World Health Organization Global Network of Age Friendly Cities and Communities, and includes outcomes like the Older Adults Needs Assessment (2015), the Edmonton Seniors Declaration, the Age Friendly Innovation Fund, and various projects and programs.

The Action Plan establishes several strategic goals and actions related to the mental health and wellbeing of seniors, including social and recreational participation, social inclusion, and health services. Specifically, the Plan calls for collaboration among health, wellness and community support services to prevent health problems; developing programs and strategies that promote access to social, recreational, artistic, intellectual, cultural and physical activity; and developing guidelines for stakeholders and community organizations to engage seniors, especially those who may be socially isolated. These actions are in addition to those recommending age-friendly design and maintenance of public spaces.

Relevant Projects & Programs Underway

Projects that directly connect mental health and wellness to open space are far and few between, and when they do exist, they typically focus on physical activity. Currently, the only on-going project in Edmonton that revolves around mental health, wellbeing, and open spaces is the Active Living School.

Active Living School

This ongoing program integrates a week-long active learning program (at a City recreation centre) into K-12 school curriculums. Designed to promote physical competence and active living, this program could be expanded to include outdoor curriculums and programs that showcase the full range of activities possible within the green network.

Relevant Funding Streams & Mechanisms

There are many ways to generally fund and finance open space. The following is an overview of programs (most of which target physical activity and fitness) that fund mental health and wellbeing-related projects and their operational costs.

Provincial Funding Sources

» **Community Initiatives Program (CIP)** supports project-based initiatives in areas such as community services, seniors' services, libraries, arts and culture, sports, education, and health and recreation. Maximum grant is $75,000 per project per year; funding is approved on a matching grant (met by financial contribution, volunteer labours, services, or donated materials or equipment) basis.

» **Alberta Active Living Grant** provides funding to assist Alberta Active Living Partners organizations and Alberta TrailNet Society with annual operating and programming costs.

» **Organizational Support Grant** is an operating grant to provide assistance to recreational organizations for programs, operations, leadership, and volunteer development.

» **Recreation and Physical Activity Project Grant** supports projects that foster cooperation, innovation, and research in recreation and physical activity programming.

» **Recreation and Physical Activity Project Micro Grant** are project grants for up to $25,000 in a competitive assessment process.

City of Edmonton Funding

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhod play, wellness, and learning through active partnerships with the community.

» **Community Facility Partner Capital Grant Program (CFPCG)** supports partnerships that enhance public use facilities. Funding is allocated across the city to organizations with a primary mandate in at least one of the following key sectors: arts and heritage, multi-cultural, recreation/amateur sport, seniors, and/or social services and community development.

Other Funding Sources

» **Alberta Recreation and Parks Association - Participation Teen Challenge**, sponsored by Coca-Cola Canada, aims to help teens become more active through grants of up to $500 that break down barriers to get teens "moving."

» **Canadian Tire Jumpstart Program**, a community-based charitable program that helps kids across the nation in financial need participate in organized sport and recreation.

» **Evergreen Grants** a leading funder of nation-wide community and school greening projects, and provides training, design, maintenance advice, and a range of resources.

» **KidSport Alberta Chapter Provincial Funding** is a national not-for-profit that provides financial assistance for registration fees and equipment to kids aged 18 and under.

» **Health Promoting School Funding Opportunities – Elementary and Secondary** is a funding opportunity by Physical & Health Education Canada to promote activities and services that take place in schools and their surrounding communities in order to enable children and youth to enhance their health, develop to their full potential, and establish productive and satisfying relationship today and in the future.

» **The Alberta School Community Wellness Fund** is a joint initiative between the University of Alberta's School of Public Health and the Government of Alberta to advance comprehensive school health. This program funds projects that enhance health and wellness among school-aged children and youth to create sustainable healthy school communities. The three priority areas for the fund are: healthy eating, active living, and positive social environments to include healthy relationship.

Best Practices & Trends

Possibly the most important element to ensuring mental health and wellbeing for urban residents is simply the provision of frequent and quality open spaces, especially natural areas, near (generally within a 15-minute walk of) homes, workplaces, schools, and community facilities. There are many toolkits that address public health, the built environment, and ensuring physical activity. Those listed below highlight the range of toolkits available from a variety of sources:

» **Action Strategies Toolkit**, produced by the Leadership for Healthy Communities, is a collection of best policies and practices to reduce childhood obesity, with a focus on two key areas: (1) active living and the built environment, and (2) healthy eating. This document has a wealth of resources, like policies and case studies, that may be useful for determining active living strategies for the green network, and for ensuring Edmontonians' wellbeing.

» **Canada's Physical Activity Guidelines** provide specific recommendations on how to get moving and stay active for five age groups: the early years (ages 0 to 4), children (ages to 11), youth (ages 12 to 17), adults (ages 18 to 64), and older adults (ages 65 and over). These guidelines provide information regarding appropriate intensity of activity and types of activities, as well as recommended length and frequency of recreational activity and suggestions for how physical activity can fit into one's daily life.

» **Healthy Built Environment Linkages: A Toolkit for Design, Planning, and Health** was developed in 2014 by Provincial Health Services Authority and a public health team, under the leadership of the Healthy Built Environment Alliance (HBEA). This toolkit provides general principles, guidelines, and connections for creating a healthy built environment through five key components: Healthy Neighbourhood Design, Healthy Housing, Healthy Food Systems, Healthy Natural Environments, and Healthy Transportation Networks.

» **Alberta Recreation and Parks Association Benefits Hub** is an online database of research and resources that support the value of open spaces with respect to health, wellbeing, and quality of life.

» The **Centre for Active Living** outlines five components, each with their own set of steps, to creating physical activity-friendly communities, as outlined below.

1. Develop Healthy Public Policy.

2. Establish Community-Oriented Physical Environments.

3. Foster Supportive Social Environments.

4. Increase Public Education.

5. Establish a Research and Knowledge Exchange.

Health Impact Assessment

Finally, while most best practices and trends relate to active and physical health, one example of a comprehensive public health best practice for planning and design is the Health Impact Assessment (HIA). An increasingly used tool in the integration of planning and public health is the HIA, a process to evaluate the potential health effects of a plan, project, or policy before it is built or implemented. An HIA brings potential public health impacts and considerations to the decision-making process that traditionally fall outside the traditional planning and public health areas. Though typically an entirely voluntary process, there are a few countries across the world that have mandated HIA as part of a regulatory process. The major steps in conducting an HIA include:

» Screening – identifying plans, projects, or policies for which an HIA would be useful.

» Scoping – identifying which health impacts to consider.

» Assessing risks and benefits – identifying which people may be affected and how they may be affected.

» Developing recommendations – suggesting changes to proposals to promote positive health effects or to minimize adverse health effects.

» Reporting – presenting the results to decision-makers.

» Monitoring and evaluating – determining the effect of the HIA on the decision.

Precedents

There are few precedents that explicitly demonstrate the role of open space in improving residents' mental health and wellbeing. The following are examples of two project processes, through which health benefits are considered during both the design and planning stages of projects that focus explicitly on community, residents', and visitors' health.

Open Spaces Sacred Places | United States

The TKF Foundation is a private non-profit that created the Open Spaces Sacred Places grant program in a deliberate effort to recognize and showcase the links between nature and health, and design and research. Their main intention, which is reflected in all the chosen projects, is that exposure to nearby natural environments offer sanctuary, solace, reflection, and mindful interaction that can deliver transformational benefits to users and surrounding communities. Based in Annapolis, this foundation has funded projects across the U.S. that build green spaces to facilitate healing, therapy, wellbeing, solitude, and sanctuary, such as gardens in partnership with hospitals (Providence Hospital) and prisons (Metropolitan Transition Center). For a complete list of projects and their impacts, refer to www.naturesacred.org.

North Aurora Regional Recreation | Denver Metro Region, CO

With funding by Stapleton Foundation, a health impact assessment (HIA) was used in this project to make recommendations on the siting of the regional recreational centre, based on access, equity, and supporting the health, safety, and wellbeing of residents in the area. The HIA analyzed available community health data, determined data gaps, and collected additional planning data on several properties to determine the best location for the future community amenity based on the following questions:

» What is the current health status of populations within North Aurora and how is it affected by the sites under consideration?

» In addition to health, what other factors should be considered in the site decision for the North Aurora recreation facility?

» What are the recommendations and expected outcomes to support overall health in relation to health status, access, and affordability for all North Aurora residents, particularly those most in need?

This project is an example not only of how health and wellbeing of the residents were considered in the planning and development of a community resource, but also the inclusive, equitable process involved in making the recommendations. The assessment made sure to include minorities by incorporating bilingual survey collection, as well as highlighting equity as a key determining factor.

1. TKF SACRED PLACE

An example of a space designed through the TKF Foundation as a respite in nature, with mental health and therapy in mind.

Source: David Harp via naturesacred.org

Learn & Play

Nature provides unique opportunities for people of all ages to learn about environmental processes and cultural and historical heritage through a variety of potential programming or free form play. Open spaces and nature are integral to the mental and physical development of children.

Key External Stakeholders / Organizations

This function encompasses perhaps the broadest range of stakeholders, engaging schools and educators at all levels from day care to universities. Edmonton's green network can provide open spaces for learning and playing both through unstructured play and educational programs or events. Below is a comprehensive list of stakeholders that may be interested in how the green network can be better used to facilitate learn and play activities.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can be integrated with educational programing, as well as promote unstructured, play environments.

Alberta Council for Environmental Education (Get Outside and Play)

Alberta Culture and Tourism

Alberta Education

Alberta Environment and Parks (AEP)

Alberta Recreation and Parks Association

APPLE Schools: Alberta Project Promoting Active Living & Healthy Eating

Boys and Girls Clubs of Canada (Western Region)

Canadian Coalition for Public Health in the 21st Century

Canadian Fitness and Lifestyle Research Institute

Canadian Playground Safety Institute

Canadian Public Health Association (CPHA)

Child and Nature Alliance of Canada

Children and Nature Network

Earth Rangers

Edmonton Catholic School Board

Edmonton Francophone School Board

Edmonton Horticultural Society

Edmonton Nature Club

Edmonton Public Libraries

Edmonton Public School Board

Environmental and Outdoor Education Council

Ever Active Schools

Forest School Canada

Glenora Child Care Society

Health & Physical Education Council – The Alberta Teachers' Association

Healthy U (Province of Alberta)

Kids at Hope

Lawson Foundation

Leisure Information Network (LIN)

Make Room for Play (ParticipACTION)

Make Something Edmonton

Nature Alberta

Nature Conservancy of Canada

Pan-Canadian Joint Consortium for School Health

Pan-Canadian Public Health Network

Public Health Agency of Canada

River Valley Alliance

Scouts and Girl Guides Canada

Sustainable Food Edmonton

University of Alberta – environmental and outdoor education specialists

Relevant Plans & Policies

Edmonton's green network can provide open spaces for learning and playing both through unstructured play and educational programs or events. Because of the variety ways that people learn and play, this function can be accommodated in a variety of different open spaces, from large natural areas to small downtown squares. The idea of play is common in most recreation policy and planning documents, but is not a common focus in these documents and is rarely mentioned in association with learning implications and the developmental impacts for children. For example, the **Active Alberta Policy** includes policy for participation for unstructured play, in addition to sports, but does not lay out a clear action plan for fostering such unstructured play, beyond "working with partners to encourage and improve opportunities." The following policy documents have begun to remedy this gap in play-focused spaces and considering children in planning for open spaces.

Child Friendly Edmonton Strategy (2006)

This strategy is based on the International UNICEF Child Friendly Cities Initiative to promote the implementation of the United Nations Convention on the Rights of the Child within the communities and environments where children live. The values that guide the Child Friendly Edmonton include a place where children and youth:

» Have a voice and influence;

» Are protected from violence and abuse;

» Feel safe;

» Play and have fun;

» Join in and participate freely;

» Create friendships and relationships;

» Feel welcome and have a sense of belonging;

» Have opportunity and choice for life-long learning and building skills;

» Feel respected; and

» Understand responsibility to themselves and others.

The document highlights three key categories for creating a child friendly city: advocacy and awareness, accessibility, and services "fit" for children. This is a high level strategy document that provides general guidelines and principles that should be incorporated into the Green Network Strategy to ensure alignment; however, further review of existing conditions will be required to make specific recommendations as to how the green network can contribute to a child friendly city.

Play: It's Serious Business (2011)

This discussion paper was developed by Alberta Recreation and Parks Association to address the growing need to return to free, unstructured play time and spaces. This document illustrates and recognizes the deficit in unstructured play and includes a set of recommendations to make changes through policy development and the involvement of children in designing playspaces. This document makes recommendations in 5 major areas:

1. Research: The ARPA, in collaboration with its national association (CPRA), should undertake research to assess the views and values that society, parents, and children have regarding play.

2. Advocacy: ARPA, in collaboration with child development, education, and health fitness agencies, should develop and deliver an education program designed to convey the importance of play and advocate for the creation of opportunities for play in all communities.

3. Engagement: ARPA should advocate for and support the engagement of stakeholders in the design of safe play opportunities.

4. Leadership: Led by ARPA, opportunities for play at the local level should be designed with the engagement of children, youth, parents, and communities, through advocacy and the provision of training and resources to communities.

5. Policy: A collaborative partnership (led by ARPA and CPRA) to develop and present a National PLAY Policy and a Charter for Children's Play.

Relevant Projects & Programs Underway

There are currently numerous park projects underway in Edmonton, however, only a few projects focus specifically on the role of open spaces in cultivating a "learn and play" environment – a learning playscape – for people of all ages. Those identified below are some of Edmonton's major efforts to design learning playscapes within open space and the natural environment.

Inquiring Minds: Site Based School Programs

This program is a partnership that offers teachers an opportunity to move their classroom to a community site for a week of hands-on, multi-sensory learning. Some of the current sites for these programs include: Active Living School, City Hall School, Edmonton Oilers ICE School, Edmonton Journal School, Farm School (Multicultural Heritage Centre), Fort School (Fort Edmonton Park), Green School (Devonian Botanic Garden), Jube School (Northern Alberta Jubilee Auditorium), Museum School (Royal Alberta Museum), School at the Legislature, Science School at TWOSE (Telus World of Science Edmonton), Sound School (Winspear Centre), U School (University of Alberta), and Zoo School (Edmonton Valley Zoo). Potential future sites for this program and other learning opportunities should be considered in the development of the Green Network Strategy.

Little Green Thumbs

This program by Sustainable Food Edmonton engages students in learning and caring about the plants and the environment that people rely on. The program is available to schools in the Capital Region (excluding Parkland County) and enables students to participate in seed planting and transplanting, daily plant care, and vegetable and herb harvest, as well as preparing and enjoying these yields. Though it is currently an indoor program, this is an excellent model that could be expanded to outdoor spaces within the green network.

Urban Ag High (Sustainable Food Edmonton)

This project (launched in the fall of 2013) by Sustainable Food Edmonton seeks to build a community of practice around urban agricultural projects in Edmonton, and connect educators, resources, and skills in order to provide experiential learning opportunities for junior and senior high school students.

Winter Play – Glenora Child Society

With funding through the Lawson Foundation's Outdoor Play Strategy, this project seeks to engage preschool-aged children in outdoor play activities in almost any weather, by developing a more creative outdoor space with child-friendly loose parts and special areas (wind shelters, infant snow play, sculpting, bird feeding, warming areas, etc.) and by taking regular winter field trips to local outdoor natural spaces and nature reserves. In coordination with the City of Edmonton's "For the Love of Winter" strategy, this project is aiming to foster a love of outdoor, unstructured play, no matter the season.

1. LITTLE GREEN THUMBS

Students learn gardening and growing skills in this Sustainable Food Edmonton program.

Source: Sustainable Food Edmonton

Drop-In Programs

» Green Shack Playground Program: Children aged 6-12 are welcome to join in games, sports, crafts, music, drama and special events at neighbourhood parks (including school sites) throughout the city.

» Flying Eagle Program: Offered through Green Shacks, the program gives participants an opportunity to learn more about Aboriginal teachings and traditions through arts and crafts, games and sporting activities.

» Pop Up Play: Games and activities are made available twice per week to children aged 6-12 at neighbourhood parks throughout the city.

» Youth Drop-in Hubs: The program offers variety of activities offered to youth aged 12-17, such as skateboarding, sports, and crafts, at Athlone, Kilkenny, Mill Woods Skateboard and James Ramsay Parks.

» Learn to Skate Programs: Children aged 6-12 can try out basic skating skills through on-ice games and activities at various neighbourhood rinks across the city.

» Bike Safety Program: Geared to individuals and families of all ages, the program teaches basic bike safety skills while participating in stations, games and activities like making a personalized bike plate.

» Family Nature Nights: Held at various parks throughout the summer, field seminars promote learning with expert naturalists.

Registered Programs

» Day Camps: Countless day camps are offered at various venues throughout the city, including John Janzen Nature Centre, Fort Edmonton Park, Edmonton Valley Zoo, and River Valley and neighbourhood parks, on themes ranging from recreation and nature education to crafting and imaginative play.

» River Valley Programs: Focusing on outdoor activity and education, programs include day camps, recreation and wellness courses, and sports and outdoor skills days for school groups.

» Fitness and Recreation Courses: A variety of ongoing, registered programs are available to people of all ages on topics such as archery, paddleboarding, canoeing, and cycling and triathlon clubs.

Relevant Funding Streams & Mechanisms

There are a handful of grant programs that target improvements of children's learning and playing environment. Almost exclusively focused on children, rather than all ages, these programs fund investments in these spaces, as well as increase opportunities for children to participate.

City of Edmonton Funding

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhod play, wellness, and learning through active partnerships with the community.

2.

2. URBAN AG HIGH

High school students engage in urban agriculture in Edmonton.

Source: Sustainable Food Edmonton

Other Funding Sources

» **RBC Learn to Play Project** provides grants to local organizations and communities to support physical literacy for kids and youth to get children active and promote sports and physical activity as a part of a healthy lifestyle. Learn to Play Program Grants range from $1,000 to $10,000 to support local organizations in implementing programs, while the Learn to Play Community Grants range from $10,000 to $25,000 and support communities that develop and implement action plans to transform the way sport and physical activity is planned, delivered, and accepted within their community.

» **TD Friends of the Environment Foundation** supports a wide range of environmental initiatives, with a primary funding focus on environmental education, urban greening, and enhancing biodiversity and energy conservation. A number of groups are eligible for this funding, including registered Canadian charities, educational institutions (primary, secondary, post-secondary), municipalities, and aboriginal groups.

» **The Lawson Foundation** has ongoing grant programs that focus on three impact areas: early child development; (2) healthy active living; and (3) children, youth, and the environment. Additionally, there are grant programs through the Miggsie Lawson Fund and a Special Initiatives Program. A Canada-wide foundation, these grants are typically for more substantial amounts and given to programs/projects over a year or more.

» **Toyota Evergreen Learning Grounds School Grounds Greening Grants** helps schools create outdoor classrooms to provide students with a healthy place to play, learn, and develop a respect for nature. This program provides up to $3,500 to public schools and daycares.

Best Practices & Trends

Educators and research in recent years have begun promoting several major concepts for open spaces as learn and play environments. Largely in response to overly structured, "safe" playgrounds, decreased recess time, and increased time indoors on computers, there has been a major shift to return to nature for learning and playing. Advocates have begun promoting nature as foundational to childhood development, enabling children to learn about: risk, decision-making, their creativity and imagination, cooperation with others, and their physical capability. As a result there are three major trends in creating learn and play spaces: natural playgrounds, the concept of unstructured play, and the outdoor classroom.

Natural Playgrounds

Natural Playgrounds are spaces within a natural setting or with nature-based features that are designed as a safe play environment. Elements within a natural playground can include raw items (such as logs, boulders, and rocks), rough and uneven surfaces, materials that can be manipulated (such as sand, dirt, gravel, water, and sticks), and reflective and colourful items of varying shapes, sizes and material that can be used for art, building, murals, music, etc. There are a number of resources to help design, build and maintain successful natural playgrounds, including **Nature Play and Learning Places (2014),** a set of national guidelines created in partnership between the National Wildlife Federation and the Natural Learning Initiative.

Outdoor Classrooms

The Outdoor Classroom is occurring throughout all levels of education, all the way from daycares to higher level education. However, outdoor classrooms can take many shapes. Some are more formal, designed outdoor spaces for an educator to deliver a presentation or hold a class, while other spaces are designed so that the space itself is the classroom, and students learn by walking around and exploring. In both cases, designing these spaces to capitalize on the natural environment can lead to unique, engaging learning experiences for all ages.

Unstructured Play

Unstructured Play is a new response to the trend in the past couple decades of overscheduling and overprogramming children. Many studies have investigated this trend to determine and quantify the benefits of unstructured, or "free" play. The general consensus is that unstructured play enables children to develop the flexibility need to adapt to changing circumstances and environments – essentially the skill to self-direct and self-motivate. As a result, playgrounds in more recent years have shifted to become more of a "playspace" area with less intensive facilities and amenities that can be adapted and changed according to the user. This allows children to dictate the playspace, rather than the playground dictate their actions and behaviours. Open, natural spaces have been key to this transition, as these types of environments are engaging, allowing children to roam and explore on their own or in groups, without programmed activities.

Precedents

The precedents identified below are just a few within the growing trend of projects that focus on creative, natural play spaces for children to learn and develop essential skills.

The Museum Backyard | Santa Barbara, CA

An extension of the Santa Barbara Museum of Natural History, this project was started in 2008, with the Backyard being completed first in 2008 and the Nature Club House finished in 2012. This project is a community-based nature play and learning area created as a space where children can feel connected to nature, work with and learn from knowledgeable adults, and participate in organized programs and/or follow their own inclination.

Space to Grow: Greening Chicago Schoolyards | Chicago, IL

This program is a partnership led by Openlands and Healthy Schools Campaign to transform Chicago schoolyards into inviting green open spaces that provide students, their families, and the broader community with the opportunity for active play, space for physical education classes, opportunities for outdoor learning, gardening and environmental literacy, and engagement with art. As of the fall of 2015, six schools have had their schoolyards transformed through a year of community planning, summer construction, and student and community planting days.

3. THE MUSEUM BACKYARD

This natural playscape leverages its connection to the natural history museum to faciliate learning in the natural environment.

Source: songsofthe wilderness. wordpress.com

4. DONALD MORRILL ELEMENTARY SCHOOLYARD

This schoolyard was redesigned / redeveloped as part of Space to Grow's Greening Chicago's Schoolyards.

Source: Dan Wendt via healthyschools campaign.org

Parkwood Children's Centre | London, ON

This play space was designed by Earthscape Play as a natural playground at Parkwood Hospital, aimed at preschool children. With an emphasis on natural elements and materials, this space allows for both programmed and unstructured play, enabling children to change and adapt the playscape to suit their needs.

Portland Children's Museum | Portland, OR

The mission of the Museum is to create transformative learning experiences through the arts and sciences. One foundation of its philosophy is that the environment is a "third teacher" that supports exploration, creation, collaboration and discovery. Its Outdoor Adventure is a 1.3-acre space that includes a maze, sculptures, landscaping, trails and creeks, sand and water features, a "campsite", and a "Zoom Tree" that encourages climbing - all designed with education experts' input.

5. NATURAL PLAY ELEMENTS IN PARKWOOD CHILDREN'S CENTRE

Designed by Earthscape Play, this natural playground incorporates not just natural materials, but also natural elements for creative play.

Source: Earthscape Play

6. PORTLAND CHILDREN'S MUSEUM

Water feature in the Toddler Area in the Outdoor Adventure exhibit space, which incorporates all of the learning elements in a smaller, enclosed space.

Source: Portland Children's Museum

ECOLOGY

The Green Network supports and enhances the environment, sustaining healthy and resilient ecosystems by providing and enhancing ecological services.

ECOLOGY

Water Management
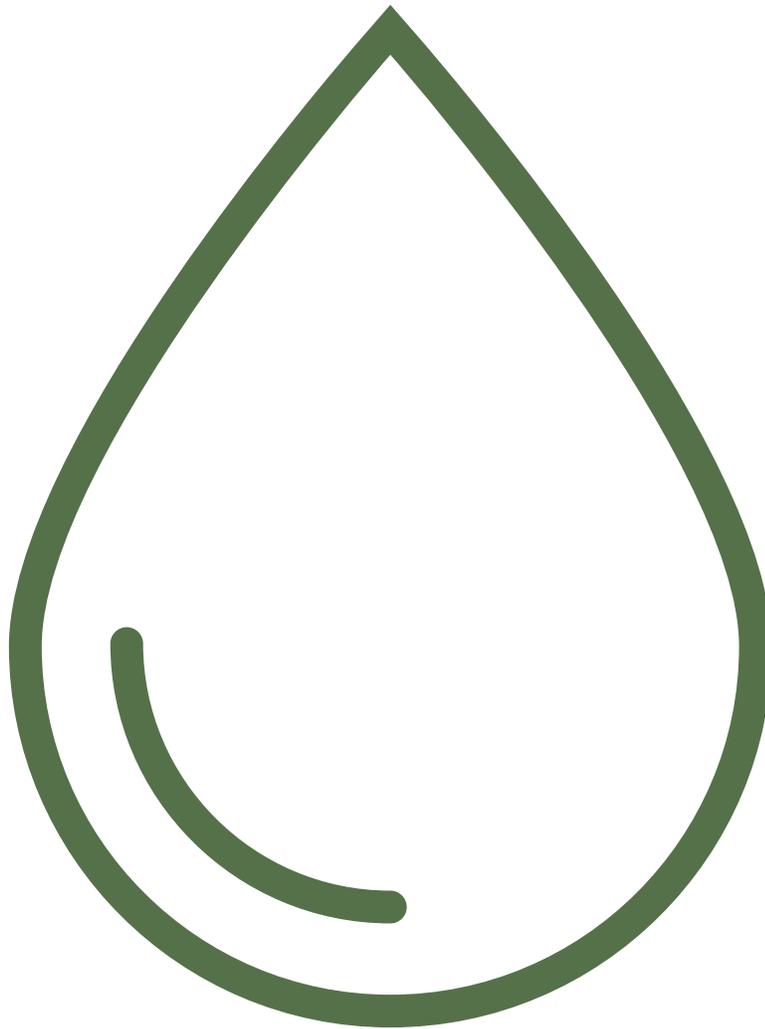
Open spaces have the capacity to handle a significant amount of stormwater, as well as provide water storage, treatment, and purification for the city, reducing the impact of the city on water quality and quantity in the North Saskatchewan River. Strategic investment in green infrastructure integrated within the green network can provide water management services that alleviates pressure and costs on the city's hard infrastructure (waste, storm, and potable water services).

Key External Stakeholders / Organizations

The City of Edmonton works with many important stakeholders and organizations invested in water management at the federal, provincial, and city-wide level to develop plans and policies related to urban water management. Some of these stakeholders are directly involved in water management, while others support projects or initiatives that indirectly improve water quality and quantity in the urban environment.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can support and aid water management in the city, to improve not only watershed health, but to also alleviate and mitigate flooding risks.

Fisheries and Oceans Canada

Transportation Canada

Alberta Env. Monitoring, Eval. and Reporting Agency (AEMERA)

Alberta Environment and Parks (AEP)

Alberta Innovates Technology Futures

Alberta Tourism, Parks, and Recreation

Alberta Conservation Society

Alberta Environmental Network

Alberta Land Trust Alliance

Alberta Riparian Habitat Management Society (Cows and Fish)

Alberta Water Council

Canadian Parks and Wilderness Society (CPAWS) Northern Alberta Chapter

Capital City Health Authority

EcoCity

Edmonton and Area Land Trust

Edmonton Low Impact Development Partnership

Edmonton Nature Club

Edmonton Natural Areas Advisory Committee

Environmental and Outdoor Education Council

Green Communities

Nature Alberta

Nature Conservancy of Canada

North Saskatchewan River Keeper

North Saskatchewan Watershed Alliance

River Valley Alliance

RiverWatch

The Sierra Club

Toxics Watch Society of Alberta

Urban Development Institute

Relevant Plans & Policies

Because water moves through the urban landscape, it is connected to people, activities, and land use from the uplands to the river valley. The ability of open spaces to enhance or support the quality and quantity of water in the urban environment is therefore potentially affected by any policy or plan that touches on stormwater management; conversion of land to impervious surfaces; remediation and management of contaminated sites; landfill and waste management policies; effluent quality guidelines and allowable limits; or the protection of vegetative cover in riparian areas and uplands. However, policies and plans that are specific to water have been identified in this Brief, and are summarized below, with the recognition that there is significant overlap between water management concerns and environmental management in general. These policies and plans can be organized into three general topics of interest for urban water management: preservation of natural wetlands and waterways; effective stormwater management; and water / wastewater effluent standards. Plans and policies which are potentially applicable to open space planning have been identified here.

Federal Acts, Policies, and Guidelines

Water is a carefully managed resource, with overlapping and complementary regulations at the federal, provincial, and municipal levels. Federal regulations applicable to urban water management include water effluent guidelines and limits; fisheries legislation; wetland policies; and the navigation of major waterways. While some of this legislation is only applicable when a waterway is disturbed, or on federally-owned lands, they serve as guidelines for provincial legislation which is often partially or wholly based on its federal counterpart. Each summary provided below outlines the purpose of federal plans and policies that are either directly related to urban water management, or which provide a framework or foundation for provincial plans and policies related to urban water management.

CANADA WATER ACT (2014)

The Canada Water Act provides a framework for federal-provincial arrangements governing the protection and management of surface waters in Canada for the purposes of prioritizing research, informing planning, ensuring conservation, and guiding the development and use of water resources. The Act therefore supports comprehensive water resource management programs for waters of national interest, including interprovincial waters, or international or boundary waters. The Act provides motivation and guidance for establishing water resource management plans for the North Saskatchewan River as an interprovincial waterbody. An Integrated Watershed Management Plan has been established in partnership with the Government of Canada, Province of Alberta, The North Saskatchewan Watershed Alliance, and numerous municipalities, including the City of Edmonton.

FEDERAL POLICY ON WETLAND CONSERVATION (1991)

The purpose of the Federal Policy on Wetland Conservation is to "promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and in the future." The policy applies to provincial/federal partnerships for wetland conservation in general, and the conservation of wetlands on federal lands in particular. In this capacity, the policy provides guiding principles for recognizing the importance of wetland conservation at all levels of government and the public, including municipal governments. This includes seven recommended strategies for the use and management of wetlands: public awareness; managing wetlands on federal lands; promoting wetland conservation in federally protected areas; enhancing cooperation among stakeholders; conserving wetlands of significance to Canadians; ensuring sound scientific basis for policy; and promoting international actions.

The Green Network Strategy will recognize the important ecological functions provided by wetlands, such as water recharge, flood reduction, climate stabilization, nutrient and pollutant uptake, carbon storage, and many other services.

CANADA FISHERIES ACT (2015)

Under the Canada Fisheries Act, "No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery." The Fisheries Act applies to any activity that could potentially cause serious harm to fish, either from activities within waterways (e.g. bridge construction), or from activities that cause the discharge of deleterious substances (e.g. wastewater discharge into a fish-bearing waterway). The North Saskatchewan River is one of the waterways protected by this Act, which runs through the City of Edmonton and into which stormwater and wastewater from the city is discharged. The Fisheries Act does not apply to artificial waterbodies that do not discharge into fish-bearing waters (e.g. hydrologically isolated ponds), and generally does not apply to work occurring outside the high water mark of a fish-bearing waterbed. However, it can be applied to deleterious substances from urban stormwater and treated wastewater, which could instead be intercepted by stormwater ponds, water treatment facilities, naturalized stormwater channels, bioswales or other open space features.

CANADA WASTEWATER SYSTEMS EFFLUENT REGULATIONS (2012)

The Wastewater Systems Effluent Regulations were established to provide for the discharge of deleterious substances from wastewater into fish bearing waters within certain allowable limits. The regulations apply to all wastewater systems, including both intermittent (e.g. waste lagoon) and continuous (wastewater treatment plant) wastewater systems. The regulations limit both the volume of discharge, and the quality of discharge in terms of deleterious substance concentrations/amounts. Under the Regulation, wastewater systems that meet certain criteria must report releases of designated substances. This regulation provides a basis for provincial wastewater and stormwater legislation such as the Storm Water Management Guidelines for the Province of Alberta (1999).

NAVIGATION PROTECTION ACT (2014)

The Navigation Protection Act protects the navigability of major lakes and rivers in Canada from obstructions or impediments that would permanently impact the use of those waters for transportation purposes. Under the Act, the Minister of Transport must be notified, and approval granted, for any construction or alteration of works within or across the North Saskatchewan River from the confluence with Ram River to the confluence with the South Saskatchewan River. The Act also protects the recreational use of major waterways, and prohibits any project or program that would permanently alter use of waterways for navigation purposes.

Provincial Acts, Policies, and Guidelines

Alberta's water resources are managed and regulated by the province, which protects the quality and quantity of water for human use, and to preserve ecosystem integrity. Provincial regulations applicable to the water management function of open spaces include policies related to water effluent standards, wetland management and preservation, and water allocation.

ALBERTA WATER ACT (2014)

The Water Act regulates the diversion of water from surface and groundwater sources, including the provision of water licenses. (Activities such as pipeline construction, watercourse crossings, and outfalls are covered by other regulations.) Under the Water Act, a licence is required for diversions of water with a few exceptions: household purposes, traditional agriculture use, and exemptions under the Water Act - Water (Ministerial) Regulation. The Alberta Water Act also provides a framework for the restriction of land development within floodplains, and allows for water management plans to be developed to address local and regional issues. Municipalities can submit their Master Drainage Plans for approval under the Alberta Water Act. While this is voluntary, if a municipality can demonstrate the individual components comply with the Master Drainage Plan, there would be no requirement to get individual Water Act approvals for each project under the Master Drainage Plan.

ALBERTA WATER FOR LIFE STRATEGY (2008)

The Strategy provides recommendations for water management in Alberta based on two key themes: safeguarding our water resources, and accelerating our actions to protect water sources now, rather than waiting until later. The strategy outlines the principles and priorities by which Alberta manages the province's water resources, and establishes the following goals: safe, secure drinking water; healthy aquatic ecosystems; reliable, quality water supplies for a sustainable economy; and action on knowledge and research, partnerships, and water conservation. The principles outlined in the Alberta Water for Life Strategy can be used to identify key priorities for municipal water management, and supports the integration of sustainable water resource management into open space planning at the strategic level.

NORTH SASKATCHEWAN RIVER INTEGRATED WATERSHED MANAGEMENT PLAN (2012)

The Plan outlines recommendations and strategic approaches to land management in the North Saskatchewan River for the purpose of sustaining water resources in the watershed for the long term, and to meet the goals of Alberta's Water for Life Strategy. It was created by the North Saskatchewan Watershed Alliance, a non-profit entity mandated by the government to carry out watershed planning for the North Saskatchewan River. The City of Edmonton is a member of the Watershed Planning and Advisory Council under this alliance. The goals of the North Saskatchewan Integrated Watershed Management Plan include:

1. Water quality in the North Saskatchewan River Watershed is maintained or improved.

2. Instream flow needs of the North Saskatchewan River watershed are met.

3. Aquatic ecosystem health in the North Saskatchewan Watershed is maintained or improved.

4. The quality and quantity of non-saline groundwater are maintained and protected for human consumption and other uses.

5. Watershed management is incorporated into land-use planning processes at all scales in accordance with the recommendations of the Plan.

The Plan also directs that municipalities continue to participate in ongoing watershed planning activities, use the recommendations of the plan to guide the preparation and implementation of statutory plans and best management practices; and work with the Alliance and other watershed stakeholders to communicate and implement best management practices. The goals of the North Saskatchewan River Integrated Watershed Management Plan align with the guiding principles of the Green Network Strategy, which works in tandem with other City plans and policies to address the recommendations of the Plan.

ALBERTA FRAMEWORK FOR WATER MANAGEMENT PLANNING (1999)

The Alberta Framework for Water Management Planning "outlines the process for water management planning and the components required for water management plans in the province. It applies to all types of waterbodies, including streams, rivers, lakes, aquifers and wetlands, and takes a holistic approach." All water management plans in Alberta are required to follow the Framework for Water Management Planning, although only Approved Water Management Plans must be considered for licensing and approval decisions. Approved Water Management Plans set guidelines on water quantity and quality which are specific to the waterbody/waterway, such as limitations on water allocations and license transfers, or water quality objectives.

This framework is based on the concept of Integrated Resource Management (IRM), a unifying theme for Edmonton's Green Network Strategy. The Framework outlines Water Management Principles; roles and responsibilities for provincial and municipal governments; appropriate scope for Water Management Planning; planning priorities; water conservation objectives; and additional water management guidelines. In addition, if an Approved Water Management Plan is developed for the North Saskatchewan River, this is one potential mechanism for providing strategic direction for water license approvals in the North Saskatchewan River Watershed, and should be considered as a potential priority for the Edmonton's Green Network Strategy.

WATER MANAGEMENT FRAMEWORK FOR THE INDUSTRIAL HEARTLAND AND CAPITAL REGION (2013)

The North Saskatchewan River is covered by this Framework, which provides direction on integrated regional solutions to address water quantity and quality issues associated with its use. The goals of the framework are to improve water quality from fair to good; minimize load discharge; minimize the impact of development on the North Saskatchewan River; and assign values or threshold levels for specific contaminant concentrations. The framework outlines specific solutions and targets for water quantity and quality management in the North Saskatchewan River, which are reflected in City policy related to effluent and stormwater management. Open spaces can influence these metrics, and the Green Network Strategy should address this and other principles of integrated regional water planning.

ALBERTA WETLAND POLICY (2013)

The Alberta Wetland Policy "provides the strategic direction and tools required to make informed management decisions… to conserve, restore, protect, and manage Alberta's wetlands". The policy provides guidance on the valuation of wetlands in terms of their ecological function, and focuses on three strategies for wetland management in Alberta: flexibility in wetland management; effective tools, knowledge, and capacity; and conservation of wetlands and promoting voluntary stewardship. Under this policy, wetlands of the highest value must be protected for the long-term benefit of all Albertans. Where development activities have the potential to impact wetlands, the wetland policy advocates for avoidance and minimization. These are principles which should be recognized in the Green Network Strategy, specifically the recognition that wetlands of high ecological value should be protected to retain their ecological services, and that these services also improve the urban environment of the City of Edmonton by contributing to biodiversity, water quality improvement, flood reduction, and the anthropogenic value of land. Further goals and priorities in the management of wetlands within the city are outlined in the City of Edmonton Wetland Strategy (2012).

ALBERTA ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT (EPEA) (2014)

The EPEA mandates that all stormwater management facilities must meet provincial standards for the timing, quantity, and quality of stormwater runoff release. The City of Edmonton EPEA Approval to Operate (No. 639-03-00) is the governing document for the City of Edmonton's drainage system and requires specific water quality objectives be met prior to the release of water into receiving water bodies. These requirements may be recognized at the planning level if they are in alignment with the priorities of the Green Network Strategy, for example, to reduce the impact of specific water quality contaminants if they are a city-wide concern.

ALBERTA WATER QUALITY GUIDELINES FOR AQUATIC LIFE (2014) & RECREATION AND AESTHETICS (2014)

The Alberta Water Quality Guidelines provide specific thresholds for a suite of commonly monitored water quality contaminants. These thresholds are established to protect certain water uses, such as aquatic life, recreation and aesthetics. While these thresholds are not considered in detail at the planning level, if reoccurring water quality issues are present within stormwater runoff, recreational reservoirs, or downstream of the City of Edmonton in the North Saskatchewan River, there may be opportunities to prioritize plans, policies, or initiatives within Edmonton's Green Network Strategy with the potential to address specific water quality issues and thereby improve compliance with provincial water quality standards.

THE STORM WATER MANAGEMENT GUIDELINES FOR THE PROVINCE OF ALBERTA (1999)

The purpose of the Storm Water Management Guidelines for the Province of Alberta is to provide a framework for stormwater management, from the planning level to detailed design standards. Considerations outlined in the Storm Water Management Guidelines include minimizing flooding, erosion and sediment transport, protecting the aquatic environment, maintaining natural streams and wetlands, providing runoff control, developing outside floodways, and conforming with Approved Master Drainage Plans. These guidelines can be used to help prioritize water management policies.

THE ALBERTA ENVIRONMENT MUNICIPAL POLICIES AND PROCEDURES MANUAL (2001)

The Alberta Environment Municipal Policies and Procedures Manual (2001) sets minimum quality standards for stormwater runoff quality in terms of sediment removal, and stipulates the requirement for municipalities to work with Alberta Environment to develop a Master Drainage Plan. Provisions for the establishment of master drainage plans in neighbourhoods not currently covered by a plan, and for future developments, should be addressed by Edmonton's Green Network Strategy where applicable.

ALBERTA ENVIRONMENT, STANDARDS AND GUIDELINES FOR MUNICIPAL WATERWORKS, WASTEWATER AND STORM DRAINAGE SYSTEMS (2013)

The Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems sets minimum standards and design requirements for municipal waterworks, wastewater, and storm drainage systems in addition to outlining best management practices. These standards should be outlined and adhered to in any open space plan, although design standards are not typically addressed in detail at the master planning level.

City of Edmonton Plans, Policies, and By-Laws

In The Way We Green, the City of Edmonton recognizes the importance of the North Saskatchewan River in supplying the city with its water needs. The three main priorities of the plan in regards to water are to understand the capacity of the North Saskatchewan River to meet Edmonton's future needs; the potential for future water supply disturbances and the City's capacity to withstand them; and the ecological health of the river today and challenges it might face in the future as growth occurs in its watershed. The City of Edmonton will consider the ecological health of the river in its planning initiatives, including the Green Network Strategy. Additional City plans and policies related to urban water management or protecting the river ecosystem are outlined below.

DRAINAGE SERVICES MASTER PLAN 2015-2024

The Drainage Services Master Plan outlines the strategic direction for Drainage Services in the City of Edmonton in 10 year increments. The plan identifies current drainage priorities, such as protecting existing homes from flooding and accommodating new developments, and it identifies current drainage issues, such as runoff quality, water infiltration, industrial land development standards, and infrastructure rehabilitation/maintenance. The Plan aligns with the City's strategic documents, and functions as both a guidance document and a business plan for Drainage Services in the City of Edmonton. The Green Network Strategy should align with the Plan with respect to identified drainage concerns, financial priorities, and funding gaps.

RIVER FOR LIFE STRATEGY

River for Life, a 30 year water quality strategy initiated by the City of Edmonton, was developed with the mission to "[prevent] pollution by continuously reducing discharges of contaminants to the environment towards a goal of net zero impact from human activity." Four foundational processes (Planning, Adaptive Management, Partnerships and Funding) were outlined to support implementation of discharge quality enhancement projects. Building on this foundation, five implementation plans were developed to provide specific direction for reducing discharge pollutant loads to the North Saskatchewan River: residential discharge, City sites discharge, industrial-commercial-institutional discharge, grey infrastructure improvements and green infrastructure implementation. Through intensive stakeholder consultation, an Adaptive Management Plan, an Incentives Plan and a Triple Bottom Line Process were formed to support implementation of River for Life.

The River for Life Strategy guides the City's efforts for improving stormwater quality and watershed health, and fulfils the reporting requirements of the City's Approval-to-Operate issued by Alberta Environment and Parks. The goal of the strategy is to better manage the impact of stormwater discharges on the North Saskatchewan River, and it supports the larger strategic goal of limiting total loadings from all city sources into the river.

The River for Life Strategy should be considered during development of Edmonton's Green Network Strategy in terms of how it might contribute to strategic planning for open spaces city-wide, and in terms of gaps in the River for Life Strategy that may need to be addressed at the master planning level.

CITY OF EDMONTON WETLAND STRATEGY (2012)

The City of Edmonton Wetland Strategy integrates multiple city plans, policies, programs, and initiatives into one document to address the City's wetland conservation approach, and identify areas for improvement in current wetland conservation efforts. The main goals of the Wetland Strategy are to secure Edmonton's wetlands as part of the city's ecological network; manage Edmonton's wetlands to maximize their ecological function; and engage Edmontonians to support wetland conservation. The Wetland Strategy will be integral to identifying priority areas and deficiencies under Edmonton's Green Network Strategy. For example,

» The wetland classification system in the Wetland Strategy can be used to identify wetlands with high ecological value based on ecosystem services in order to target areas of the city which may require additional protection and prioritization under Edmonton's Green Network Strategy.

» Two major processes have been identified in the Wetland Strategy which are contributing to wetland degradation: habitat destruction/fragmentation, and habitat degradation. These processes should be addressed in Edmonton's Green Network Strategy.

» Edmonton's known remaining natural and constructed wetlands have been identified in the Wetland Strategy. These wetlands should be evaluated in an ecological/ natural areas inventory of the city and the results integrated into Edmonton's Green Network Strategy.

» The goals and outcomes of the Wetland Strategy align with the City's strategic plans, and should both inform Edmonton's Green Network Strategy, and may need to be updated following completion of Edmonton's Green Network Strategy to ensure alignment into the future.

CITY OF EDMONTON SOURCE WATER PROTECTION PLAN

The Source Water Protection Plan uses information about the North Saskatchewan River and its watershed to identify hazards, assess risks to source waters, and make recommendations on how to manage these risks. Potential source water risks identified in the Source Water Protection Plan include limited area of parks and protected areas; release of sewage upstream of the Rossdale Wastewater Treatment Plant; release of contaminated stormwater during heavy precipitation events; wastewater treatment effluent from other municipalities; agricultural nutrient leaching; industrial effluent and spills; dangerous goods routes; pipeline spills; and deforestation. While most of these source water risks are located outside the jurisdiction of the City of Edmonton, there may be opportunities to address some water quality concerns by prioritizing the functions of open spaces in the Edmonton's Green Network Strategy, such as proportion of green space.

BIODIVERSITY AND NATURAL AREAS CONSERVATION

Diverse, healthy riparian vegetation communities and natural wetlands provide a number of ecological services that support water quantity and quality management, such as the attenuation of nutrients and other dissolved water quality contaminants; reducing sediment load in surface runoff; providing infiltration for precipitation and thereby reducing runoff volume; lowering water tables through evapotranspiration; and lowering surface water temperatures by providing vegetative cover. Any policy or plan that encourages the protection of natural ecosystems in riparian areas, wetland complexes, or uplands potentially benefit urban water management. The following relevant plans and policies are discussed in greater detail in the Biodiversity Brief:

» **Ribbon of Green Concept Plan (1990) and Master Plan (1992)**

» **River Valley Alliance Plan of Action (2007)**

» **River Access Strategy (Ongoing)**

» **North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188**

» **Top of Bank Policy C542 (2010)**

DEVELOPMENT DESIGN AND CONSTRUCTION STANDARDS

» City of Edmonton **Design and Construction Standards** (Part 3: Drainage, and Part 5: Landscaping) stipulate requirements for new construction within the city, including recommended plant materials for restoration and green land cover, soil quality and handling standards, drainage system capacity standards, etc. While these standards will not be addressed in detail at the master planning level, the design standards could be updated to serve the priorities and implementation of Edmonton's Green Network Strategy.

» **Low Impact Development Best Management Practices Design Guide (2014)** provides guidance and best practices for Low Impact Development (LID) neighbourhoods. LID design minimizes the impact of urbanization, which tends to convert vegetative landcover to impervious surfaces via land development (such as new neighbourhoods, industrial areas, commercial space, or other types of urban developed land). LID design seeks to minimize increased volume and decreased quality of stormwater runoff by implementing green infrastructure innovations such as green roofs; rainwater capture and use in urban gardening; bioswales for treating surface runoff; green roofs; permeable pavement/roadways; naturalized drainages, etc. LID design can improve both stormwater runoff quantity/quality, and mitigate the urban heat island effect by increasing 'green' landcover. LID design should be encouraged at the Master Planning level as an effective management tool for addressing water management challenges and increasing the overall quality of the urban environment. The Design Guide is supported by an additional publication, the **Low Impact Development Construction, Inspection & Maintenance Guide** to address the long term maintenance of LID infrastructure, and ensure the future sustainabilty of LID in the City of Edmonton.

RELEVANT BY-LAWS

Carefully developed bylaws can contribute to water management by providing a mechanism to direct and prohibit human behaviour in open spaces, for example, by prohibiting the disposal of deleterious substances into stormwater systems. Bylaws govern the use and maintenance of stormwater facilities on private lands, and they have the potential to manage and restrict potential surface contaminants, or the excessive or inappropriate use of water resources. Bylaws can also protect human health by limiting access to water that poses a human health concern, for example by prohibiting the use of non-treated stormwater in public spaces for swimming or bathing, or prohibiting the use of rainwater for household uses other than in toilets, or for gardening.

Some examples of current bylaws that contribute to urban water management in the City of Edmonton are as follows:

» **City of Edmonton Drainage Bylaw** (Bylaw No. 16200) covers the implementation of stormwater management policies on private lands, and outlines the obligations of landowners.

» **City of Edmonton Zoning Bylaws** (Bylaw No. 12800) may allow for driveways on residential properties to be less impervious.

» **City of Edmonton North Saskatchewan River Valley Area Redevelopment Plan** (Bylaw No. 7188) requires assessment and review of development or construction that would impact designated areas within the valley and ravine system against a set of policies and development approval procedures (Low Impact Development Best Management Practices Design Guide, 2014). The goal of this bylaw is to preserve the natural character and environment of the North Saskatchewan River Valley and ravine system.

» City of Edmonton **Snow and Ice Control Policy** (C409G) and City of Edmonton **Roadway Cleaning Policy** (C550) together set winter, spring and summer roadway cleaning standards to provide roadway safety and protect the environment.

1. MILL CREEK RAVINE

Parts of the Mill Creek Ravine that were culverted to accommodate development are planned to be daylighted (exposed) as part of the Mill Creek Daylighting Plan.

Source: Debbie MacLeod via takethetrail.com
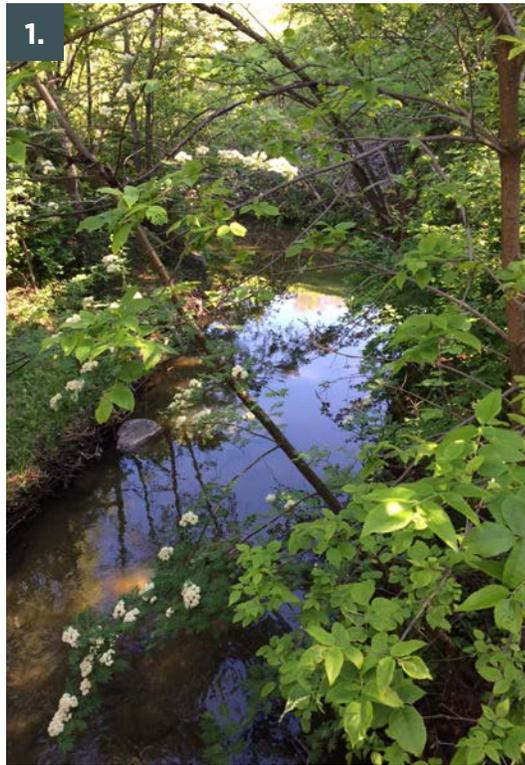
2. WHITEMUD RAVINE

Edmonton's Utility Services department has planned to construct a storm basin, including sediment capture tunnel, for storm water flowing to Whitemud Creek.

Source: Donna McKinnon via donnasrivervalley.com

Relevant Projects & Programs Underway

There are many projects currently underway in the City of Edmonton that may help inform Edmonton's Green Network Strategy in terms of addressing the water management function of open space. These are current open space projects with a water management component that may provide insight for policies related to the water management function of open spaces:

» City of Edmonton Naturalization Project

» Stormwater Management Projects:

- Kennedale End-Of-Pipe Constructed Wetland
- Groat Road Storm Basin End-of-Pipe Facility

» Mill Creek Water Quality Study

» LID-Green Infrastructure Location Study

» City of Edmonton Environmental Sensitivities Mapping Project

» Mill Creek Daylighting Plan

» Boat Docks and Launches Construction Project

» Terwillegar Park Footbridge

» River Access Strategy

» Paul Kane Ornamental Pond

» Westwood Park Ornamental Pond

» Louis McKinney Riverfront Park – Urban Beach

» William Hawrelak Park Water Play Feature

» Borden Natural Swim Experience

» Potter Greens Special Study

» West Rossdale: River Crossing (Walterdale Bridge, Touch the Water Promenade, etc.)

» Storm Water Harvesting, Irrigation and Plant Health Study (University of Alberta)

» Rain Garden in a Box Pilot Project

Relevant Funding Streams & Mechanisms

Due to the importance of protecting water resources for current and potential future use, there are many funding resources available to municipalities who wish to improve water management at the municipal level. These are just some of the funding resources available for projects with a water management component, and only include funding sources which are not part of the general funding mechanisms of municipalities.

Federal Funding Sources

» **Sustainable Development Technology Canada (SDTC) Tech Fund** disbursements are awarded for clean-technology projects (development and demonstration).

» **Federation of Canadian Municipalities (FCM) Green Municipal Fund (GMF)** are government loans and grants for sustainable neighbourhood action plans, community brownfield action plans, feasibility studies, or capital projects related to retrofitting, construction, replacement, expansion, soil remediation, or brownfield, energy, waste, water, or transportation infrastructure.

» **Federal Gas Tax Fund** supports the development of public transit systems, and water/wastewater systems, solid waste management, community energy systems, and community capacity building.

» **Canada's Economic Action Plan - Green Infrastructure Fund** supports sustainable energy generation and transmission, and municipal wastewater and solid waste management infrastructure.

» **Lake Winnipeg Basin Stewardship Fund** provides financial support for high-impact, solution-oriented projects aimed at reducing nutrient loads, and improving the long-term ecological health of the lake and watershed. Municipal governments can apply.

Provincial Funding Sources

» **Alberta Water Management and Erosion Control Program** provides financial assistance for resolving surface water management and erosion control problems.

» **Alberta Water/Wastewater Partnership (AMWWP)** provides cost-shared funding for eligible municipalities to assist in the construction of municipal water supply and treatment, and wastewater treatment and disposal facilities.

» **Alberta Ecotrust Grants** are community grants, major grants, multi-year grants, and youth environmental stewardship grants for projects that address pressing environmental issues in Alberta.

Other Funding Sources

» River Valley Alliance Funding

Best Practices & Trends

Integrated Urban Water Management (IUWM)

Integrated Urban Water Management (IUWM) is a holistic mode of strategic planning for urban landscapes. In IUWM, water management in urban spaces is examined from the regional perspective, rather than focusing on individual policies or projects. The IUWM approach is based on the integration of national and regional policies to inform water management at the municipal level, and focuses on cross-linkages between managing water demand (water needs and water conservation), water treatment (sanitation and wastewater), and water storage/retention (stormwater management, rainwater capture). It includes environmental, social, economic, technical, and even political aspects of water management, and analyzes them in the context of regional pressures (water use, land use) and the environmental setting (available water supply, physiographic region, climate).

The Alberta Framework for Water Management Planning is based on the concept of Integrated Resource Management. The framework recognizes the links between water management planning, and the management of other resources, such as forests, fish, wildlife, petroleum, minerals, and public and private lands. The principles of Integrated Resource Management are

» Comprehensive and integrated planning;

» Proactive and predictable policies;

» Responsive and flexible management;

» Consultative approach;

» Fairness;

» Knowledge-based decision making;

» Timely and results oriented;

» Accountable; and

» Clear and understandable.

Integrated Urban Water Management has great potential for encouraging the creation of open spaces with multiple functions that serve both human and environmental needs. For example, bioswales can be designed to improve runoff quality and provide a learning opportunity for school children; naturalized stormwater drainages can provide wildlife habitat and recreational opportunities; rainwater gardens and green roofs provide green cover and reduce the urban heat island effect as well as providing recreational and cultural opportunities for people.

Sustainable Stormwater Management

Sustainable stormwater management, which incorporates the concepts and practices of "low impact development", "green infrastructure", "water sensitive urban design" or "sustainable urban drainage systems" is an urban water management approach that recognizes and mitigates the impact of urban development on surface water quantity and quality. In the natural environment, the volume of surface runoff during snowmelt and rainfall is mitigated by the infiltration of water into the soil, the retention of surface water in micro-pools where it may evaporate, and by evapotranspiration processes during plant

metabolism. In the prairie landscape, excess surface runoff is often stored in wetlands, where nutrient and sediment load are naturally reduced through settling and plant uptake, improving water quality and providing habitat opportunities for wildlife. By converting natural landscapes to impervious and semi-impervious surfaces such as concrete and asphalt, this disrupts these natural processes and results in increased surface runoff that needs to be managed artificially with significant infrastructure, often producing surface water that is of poor quality and potentially contaminated with deleterious substances such as hydrocarbons, salts, heavy metals, or excess sediment.

Sustainable stormwater management aims to reduce the environmental and financial cost of urbanization by encouraging practices that mitigate these impacts. Sustainable stormwater management techniques either focus on preserving natural drainage areas and wetland complexes, or simulate these natural processes through stormwater management system design.

Innovative Stormwater Management Design

Innovative stormwater management design refers specifically to innovative design standards that apply the concepts of sustainable stormwater management at the building scale, the neighbourhood scale, or the watershed scale. Innovative design standards at the property scale could include rainwater capture for use as grey water or for gardening, green roofs, minimizing impervious surfaces through use of innovative materials or reducing building footprint, or xeriscaping (landscaping that does not require irrigation). Design at the neighbourhood scale might involve street and parking lot runoff management, bioswales with natural filters, permeable sidewalk, path, and street materials, stormwater detention and bioengineered wetlands, retention of natural wetlands/waterways, stormwater biolfiltration by compost filters, and artificial turf or plant materials with little or no irrigation requirements. Collectively, these best practices are essential components of Low Impact Development (LID) design.

Wetland Conservation and Valuation

By providing valuable ecological services, wetlands also provide a significant human benefit by reducing the cost of stormwater management, and increasing human health and wellness. However, different wetlands provide different ecological services, and can be evaluated based on the level or number of functions they provide. Part of this growing trend in wetland classification and valuation is the recognition that constructed wetlands typically are not equal to natural wetlands in their ability to provide ecological services, but can be engineered to increase or improve the services they provide. Wetland classification and prioritization based on ecological value therefore tends to favour natural wetlands over artificial wetlands, and aims to protect natural wetlands with high ecological value. At the watershed scale, comprehensive drainage systems link neighbourhoods together and can be managed as a single system using centralized water management features such as wetland complexes, reservoirs, vegetated buffer zones, and natural or naturalized drainage channels. At the watershed scale, emphasis is put on cumulative effects management, recognizing that contaminants may accumulate from upstream to downstream if not mitigated.

Riparian Corridor Protection

Like wetlands, well-vegetated riparian corridors along waterways provide several important ecological functions. They serve as corridors for wildlife movement, lower the water table through evapotranspiration, increase infiltration of surface runoff, and stabilize temperatures. The link between water quality in lotic (flowing water such as creeks and rivers) systems and the health, width, and diversity of riparian vegetation is well documented. Most approaches to water management in urban systems therefore emphasize the importance of identifying and retaining healthy riparian corridors, or restoring vegetative cover in riparian areas where significant development impacts have occurred. In addition, limiting development in riparian areas through the use of setbacks, zoning, and protected area designations also serves the purpose of flood risk mitigation and protects the value of properties adjacent to waterways.

3. BIOSWALE

Bioswales are one component of Low Impact Development (LID) design, which incorporates engineered landscapes to mimic natural storm water management.

Source: Oregon Environmental Council

4. WETLANDS

Conserving wetlands is an essential means of managing water quality and quantity in urban areas, in addition to climate mitigation and recreational values.

Source: smartgrowth.org

5. RIPIARIAN AREAS

Riparian corridors, like this one in Exmoor, Devon, UK, provide erosion control, flood mitigation, and other water management benefits where they are protected from development.

Source: Wikimedia

Re-naturalization or Re-Greening of Wetlands and Watercourses

Natural wetlands and watercourses are generally thought to provide the highest level of ecological services, and are therefore prioritized for protection from development. However, it is important to recognize that even when wetlands and watercourses have been significantly altered by human activity, some level of ecological function can be restored. This restoration can range in cost and level of effort, depending on the goals of the naturalization and the degree of disturbance. Integrated Resource Management principles would support naturalization projects that meet both ecological and human needs by creating opportunities to integrate human use of green landcover with wildlife use and other ecological services.

Multi-Barrier Approach to Source Water Protection

The multi-barrier approach to protecting source water gained popularity after the Walkerton, Ontario E.Coli outbreak in 2000, where seven people died and around 2,500 people were ill following the contamination of their drinking water. Following the outbreak a national inquiry was launched. In the resulting Report of the Walkerton Commission of Inquiry, one of the recommendations was that the government take a "multi-barrier approach" to source water protection, specifically meaning water treatment and distribution system regulations, water testing, and proper training of water managers. Since then this term has been used in a more general sense, meaning an integrated approach to water management that includes multiple 'barriers' from contaminant source, to source water. This approach can include any form of water quality control, either through direct intervention (water treatment and monitoring) or through passive design (stormwater wetlands, bioswales, retention ponds, etc). The multi-barrier approach has also been applied to urban planning related to flooding, where legislative barriers (restricted development zones, set back requirements) are combined with flooding mitigation practices (water control structures such as berms), flood risk planning (contingency and emergency response planning), and policy reform (disincentives for developers, disaster funding, etc).

Precedents

There are many excellent examples of Integrated Urban Water Management implemented across open space networks for the benefit of both human and aquatic ecosystems. Recent research projects have looked the integration of stormwater management with community and regional planning to support community resiliency, and enhance quality of life. Some examples of this research are outlined below. In addition, specific case studies are presented which highlight open space planning that supports urban water management.

Integrated Urban Water Management Strategies

» Ontario Policy Review of Municipal Storm water Management in the Light of Climate Change

» Water Environment Research Foundation: Using Rainwater to Grow Livable Communities

» Integrated Urban Water Management – Lessons and Recommendations from Regional Experiences in Latin America, Central Asia, and Africa

Parks and Green Infrastructure

Parks capture and clean stormwater, often unintentionally, through vegetation and porous surfaces. They can offer win-win situations for cities to manage stormwater runoff while also meeting recreation needs. However, new technologies and practices are needed to design, implement and maintain these values over the long term. The report **City Parks, Clean Water: Making Great Places Using Green Infrastructure (2016)**, by The Trust for Public Land, explores the intersection of green infrastructure and parks using case studies, interviews, and current data. Topics include a summary of different green infrastructure solutions to water management problems, negotiating among different uses and users of the park, and how to pay for upgrades.

Mimico Creek Watershed | Toronto, ON

The Mimico Creek Watershed in the City of Toronto drains an area of 40 km² in the former City of Etobicoke, and encompasses a variety of land uses. When the City of Toronto integrated Etobicoke into the greater metropolitan area to become part of the City of Toronto, a new stormwater planning initiative was undertaken for the Mimico creek as part of regional planning for the area. Stormwater management planning for the creek included setting water control targets, flood risk mitigation, design standards for stormwater infrastructure, and considerations for regional connectivity to other drainage systems. An important component of the regional plan for Mimico Creek is the integration of drainage system planning with open space and recreational activity planning to create multifunctional open spaces that improve the quality of life for communities in the watershed.

Integrated Stormwater Management | Bellevue, WA

High land prices and topographic limitations led the City of Bellevue to combine stormwater management and recreation functions in public parks and playing fields back in the mid-1970s. With great foresight, these public spaces were linked together by open space and surface drainages, so that they functioned as an integrated and well-connected community-wide system. This case study offers valuable information for both municipalities and land developers planning new communities around a multifunctional open space and stormwater management system.

Ivor Dent Sports Park | Edmonton, AB

Substantially completed in 2015, this 56-hectare park features 24 sports fields and associated facilities in the southeast of the city. In developing the stormwater management concept, the City of Edmonton emphasized the importance of innovative stormwater management design. An existing wetland and four engineered stormwater ponds are designed to retain all stormwater on-site. Stormwater is also used for field and landscaping irrigation wherever possible, while ensuring flood protection capacity remains available when needed.

6.

6. BIKING THROUGH MIMICO CREEK

Drainage system planning and open space planning are integrally connected through the Mimico Creek regional plan.

Source: Greg's Southern Ontario via Flickr.com

7. MILWAUKEE CENTRAL LIBRARY

Green roofs, like this one on the Central Library, are part of the Green Milwaukee Program.

Source: Todd Weiler for City of Milwaukee

8. GREEN ALLEYS

Permeable pavement aids in storm water retention and mitigates runoff in Chicago "green alleys".

Source: Center for Neighborhood Technology

9. HISTORIC FOURTH WARD PARK

This park in Atlanta, GA is featured in the City Parks, Clean Water report. It incorporates a stormwater detention pond into a community redevelopment that can handle a 1:500 flood.

Source: Urban Land Institute Atlanta

Mandatory Downspout Disconnection Program | Toronto, ON

To reduce sewer overflows and mitigate the risk of basement flooding during heavy rainfall events, the City passed a bylaw requiring all properties to disconnect their downspouts from the sewer system. The bylaw came into effect in 2011 for select properties, and will cover the entire city by December 2016. The policy promotes infiltration of stormwater into the earth rather than the sewer system, which should help improve water quality and reduce flooding in the city's green network.

The Green Milwaukee Program | Milwaukee, WI

The Green Milwaukee program is a green initiative that includes incorporating stormwater management practices based on LEED standards, with a citywide goal of reducing runoff by 15 percent. Both on-site controls (green roofs, porous pavement) and community-scale, multi-benefit treatment areas are encouraged. This case study suggests that the success of the program stems from support from the top, citizen and stakeholder input, and an approach that uses tailored solutions to address the unique water quality and wet weather control problems the City faces.

"The Greenest City in America" | Chicago, IL

Stormwater management in Chicago is part of a larger city-wide initiative to become "the greenest city in America." Adopting the strategy "we'll do it first," the city has leveraged public-sector pilot tests of green roof technology, rain gardens and downspout disconnect programs, and "green alleys" utilizing porous pavement into large-scale initiatives that boast enthusiastic private sector participation. The City's Green Permit program provides further incentives for developers to adopt new approaches by offering fee waivers and expedited permitting. A major lesson from this case study is that willingness to test new technologies in the public sector can go a long way in promoting private sector participation.
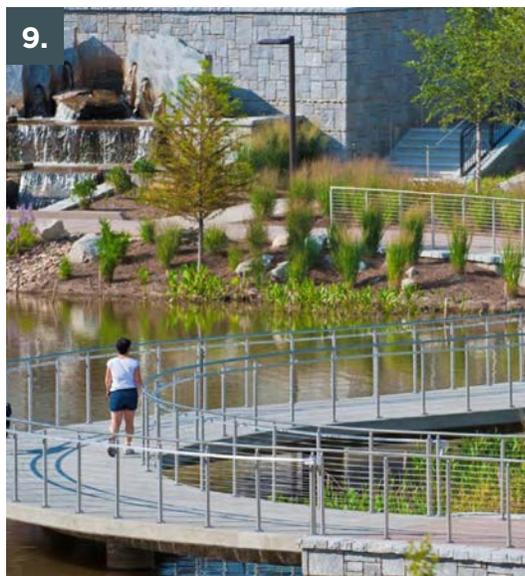
Climate Regulation

Open spaces provide a myriad of benefits for the urban, built environment, including mitigating the urban heat island effect, stabilizing micro-climates, reducing wind tunnels, improving air quality, and mitigating climate change. Strategic integration of open space, especially trees (urban forests) and other green infrastructure, can help provide climate regulation that improves the overall quality of life and environmental health of the city.

Key External Stakeholders / Organizations

The City of Edmonton works with several key stakeholders and organizations invested in air quality and climate change resiliency at the federal, provincial, and city-wide level to develop plans and policies related to the City's climate. Some of these stakeholders are directly involved with air quality or climate change mitigation, while others promote green landcover in urban spaces.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can help to regulate the city's climate, including the temperature and air quality, and mitigate the effects of climate change.

Canadian Forestry Service

Alberta Env. Monitoring, Eval. and Reporting Agency (AEMERA)

Alberta Environment and Parks (AEP)

Alberta Innovates Technology Futures

Alberta Environmental Network

Capital City Health Authority

EcoCity

Edmonton Natural Areas Advisory Committee

Environmental and Outdoor Education Council

Evergreen

Green Communities

River Valley Alliance

The Sierra Club

Toxics Watch Society of Alberta

Urban Development Institute

Relevant Plans & Policy

There are three main aspects to climate regulation in the urban environment that will be explored in this brief: air quality, temperature control, and climate change mitigation. Air quality issues such as vehicle and energy production emissions can be mitigated by imposing 'no idle' zones, reducing vehicle traffic by encouraging active and alternative transportation, and through energy-efficient design. Well vegetated open spaces provide temperature control by cooling ground surfaces through evapotranspiration and by intercepting the sun's radiative energy. Open spaces with water features can have a cooling effect on the urban environment as well, through evaporative cooling. This helps to mitigate the urban heat island effect, and prevent temperature inversions that trap air pollution close to the earth's surface and result in smog. Open spaces help to address climate change by providing an opportunity for carbon storage through increased vegetative cover, particularly trees, which take up carbon dioxide from the atmosphere, and it has been documented that well-vegetated open spaces such as parks and urban forests increase air quality in general through their ability to capture and sequester air pollutants.

Any plan or policy that protects, restores, or supports vegetative cover in open spaces will contribute to urban climate regulation. The protection of existing natural areas will therefore also contribute to urban climate mitigation; however, conservation and re-naturalization of open spaces will be discussed in the Biodiversity Brief. This brief focuses specifically on plans and policies that increase all forms of green landcover. In addition, green building design and energy efficiency will be examined where applicable to open space planning. The accessibility of open spaces by public transit (bus, LRT) and the integration of open spaces into active transportation networks (cycling, running/walking trails) is an important consideration in open space planning as well, but will be covered in the Active Transportation Brief.

Federal Acts, Policies, and Guidelines

Federal Acts, policies and guidelines related to the climate mitigation function of open spaces can be organized into two main strategies: addressing climate change by reducing greenhouse gas emissions, and protecting or improving air quality. While some of these plans or policies do not directly regulate open spaces, they provide a regulatory framework with guidelines and tools for municipal policy development which may be applicable to open space planning.

CANADA'S ACTION ON CLIMATE CHANGE

New federal climate change initiatives and polices will have legislative and funding implications, such as new carbon markets and taxation schemes. While the details of these new policies are still in development, in general the priority for the federal government will be reducing greenhouse gas emissions through legislated emissions limits and carbon pricing, and increasing carbon capture by supporting green infrastructure projects. The Green Network Strategy should consider the potential future implications of the government's mandate on reducing greenhouse gas emissions by recognizing the value of energy efficient design and green land cover in reducing the carbon footprint for the City of Edmonton.

CANADA AMBIENT AIR QUALITY STANDARDS

The Canada Ambient Air Quality Standards are health-based air quality objectives for pollutant concentrations in outdoor air. Using the Air Quality Management System, Environment Canada and Health Canada have established air quality standards for fine particulate matter and ground-level ozone (the major components of smog). These include both short-term and long term limits for exposure. Under the Canadian Environmental Protection Act (1999), provinces and territories are responsible for administering regulations and other actions to achieve these standards.

AIR QUALITY HEALTH INDEX

The Air Quality Health Index (AQHI) is a measurement tool developed by Health Canada and Environment Canada based on the Canada Air Quality Standards to describe ambient air quality conditions for certain communities, such as major urban centres. In general, urban centres are at a higher risk from air pollutants compared to rural areas due to the concentration of pollutant sources (energy production, vehicle emissions, industrial processing, etc.). The urban heat island effect can magnify the impact of air pollutants by creating temperature inversions that trap pollutants close to the surface. Air quality is rated on a scale of 1-10 based on ambient air quality risk to human health for those who are sensitive to air pollution. Understanding the air quality profile for the City of Edmonton will assist with prioritizing green landcover strategies related to open space planning, particularly where land development initiatives are in conflict with conservation and preservation policies.

Provincial Acts, Policies, and Guidelines

Provincial policies and guidelines related to air quality or climate change provide a framework of incentives and disincentives for prioritizing open spaces that support climate change mitigation strategies, which generally involve reducing greenhouse gas emissions, supporting carbon capture initiatives, and regional airshed management.

ALBERTA CLIMATE LEADERSHIP PLAN (2015)

The Plan focuses on four key areas with regards to climate regulation: phasing out coal-generated electricity and developing more renewable energy; implementing a new carbon price on greenhouse gas pollution; a legislated oil sands emission limit; and employing a new methane emission reduction plan. Under this strategy there may be new opportunities for provincially-supported programs to enhance the climate mitigation function of open space by providing funding sources, incentives, and disincentives. Carbon pricing revenues, for example, will help fund green infrastructure and renewable energy projects that may be implemented on publicly accessible spaces at the municipal level.

CLIMATE CHANGE AND EMISSIONS MANAGEMENT ACT

The Climate Change and Emissions Management Act was one of the first provincial regulations pertaining to climate change in Canada. The goal of the Act is to reduce green house gas emissions in Alberta by 50% below 1990 levels by 2020. The Act provides guidance to the province regarding goals and priorities for greenhouse gas emissions management, such as the need for innovative technological solutions for emission reductions. The Act also specifies targets for facilities emitting more than 100,000 tonnes of greenhouse gases a year and new companies that regularly emit greenhouse gases. While the targets and penalties specified in the Act are for facilities specifically and do not apply to open spaces in particular, there may be opportunities for provincially-supported carbon offset programs/projects in city open spaces as a result of this Act through the Climate Change and Emissions Management Fund.

ALBERTA AMBIENT AIR QUALITY OBJECTIVES

Alberta's air quality objectives have been established under the Alberta Environmental Protection and Enhancement Act (EPEA). These objectives were developed to address air quality issues not covered by the Canada Ambient Air Quality Standards for particulate matter and ozone. Specific and time-sensitive objectives are available for contaminants often emitted by industrial processing facilities and other emitters. Air quality data across Alberta is monitored by AEMERA (Alberta Environmental Monitoring, Evaluation, and Reporting Agency). Both real-time and forecasted air quality is available online, while historical air quality data can be requested.

It is important to recognize that open space planning can be used to address air quality issues, for example, by setting targets for the amount of green cover in parks. Historical ambient air quality data from across the City of Edmonton may be analyzed to determine if specific areas of the city have reoccurring air quality issues in order to target or prioritize management strategies related to the open space network. Currently there are four provincial air quality monitoring stations in the City of Edmonton, and six industry-operated stations.

ALBERTA GREEN BUILDING PRODUCTS AND TECHNOLOGIES STRATEGY 2015

The Strategy supports green building technologies that reduce the impact of humans on the environment. Under the Strategy, the Municipal Climate Change Action Centre provides funding, technical assistance, and education to support Alberta municipalities in addressing climate change. Several climate change-related programs are currently available under this strategy, including programs to provide municipalities with resilience planning support, financial rebates to municipalities that install solar photovoltaic on public facilities, and funding for energy monitoring and retrofits.

ALBERTA CAPITAL AIRSHED

The City of Edmonton is a participant in a multi-stakeholder group, the Alberta Capital Airshed, that works together to develop air quality management plans and improve air quality conditions in the capital region of the province.

CAPITAL REGION AMBIENT AIR QUALITY MANAGEMENT FRAMEWORK

The Ambient Air Quality Management Framework addresses the complex issues of primary and secondary pollutants in the air, specifically nitrogen dioxide (from the combustion of fossil fuels), sulphur dioxide (from industrial activity), fine particulate matter (from all emissions), and ground level ozone (from volatile organic compounds and nitrogen oxides reacting to heat/sunlight in the atmosphere). Within the framework, benchmark limits are set for each air quality contaminant, each requiring a certain mitigation strategy in response. In general, the framework approach is aligned with other complimentary frameworks, such as the Lower Athabasca Region Air Quality Management Framework, and the Clean Air Strategic Alliance Particulate Matter and Ozone Framework. There may be opportunities to align the priorities of the Green Network Strategy with strategies for reducing these priority emissions (e.g. policies pertaining to efficient energy use in park spaces and amenities), particularly where a level 3 or greater trigger has been identified for any of the four primary types of contaminants (see the Capital Region Ozone Management Plan).

CAPITAL REGION OZONE MANAGEMENT PLAN

The Capital Region Ozone Management Plan was developed by the Capital Airshed Partnership. The focus of the plan is to address documented exceedances in ozone limits identified under the Capital Region Ambient Air Quality Management Framework, and ensure that ambient levels remain below the planning trigger for ozone, thereby encouraging air quality improvement in the Edmonton region. The plan addresses ozone concentrations by developing specific actions to control the emission of nitrogen compounds to the air from industrial activity, energy generation, and transportation. There may be opportunities to align the Green Network Strategy priorities with the management objectives of the Plan by addressing some of the key causes of nitrogen emissions, e.g. vehicle use and energy efficiency. Actions directly applicable to open space planning include supporting denser urban development by creating centralized, multifunctional park spaces, or reducing vehicle use by promoting active/alternative transportation methods (cycling and walking paths).

City of Edmonton Plans, Policies, and By-Laws

The Way We Green recognizes that Edmonton's air quality has improved significantly over the last 40 years, but that reoccurring issues for two air quality contaminants remains: particulate matter and ozone, the two key components of smog. Particulate matter is emitted by combustion from a number of sources, including vehicles, wood burning, and fossil fuel burning for energy production, while ground level ozone occurs as a result of vehicle emissions reacting with sunlight and heat.

One of the key actions identified in The Way We Green is to manage the complex interactions of regulated and non-regulated point sources of air quality contaminants, such as vehicle traffic and energy production, to achieve high air quality standards. The Green Network Strategy can address air quality concerns by increasing the urban tree canopy, increasing green cover in open spaces, or reducing vehicle traffic through careful planning.

EDMONTON'S CLIMATE CHANGE STRATEGY

The City of Edmonton is working on a number of strategies to address the challenges of climate change, including an Energy Transition Strategy, a Renewable Energy Taskforce, a Green Building Plan, a City Operations GHG Management Plan, a Carbon Dioxide Reduction Program, and many others. Overall, these strategies are meant to address three main goals outlined in The Way We Green: sustainable sources and uses of energy; resilience to disturbances that can affect energy supply and distribution; and carbon neutrality. Each of these goals, and their associated policies, are outlined below.

SUSTAINABLE ENERGY USE

» **The Renewable Energy Taskforce Report** assessed the potential for the City of Edmonton to transition to renewable energy sources such as solar and wind power, and identified opportunities to implement renewable energy technologies in the city. Several of the opportunities identified in the report may be addressed in the Green Network Strategy, such as the incorporation of renewable energy systems in open space facilities (e.g. solar panels used to power local park lighting).

» A **Green Building Plan** was developed to provide a set of actions for improving environmental, social-economic, and human health performance of all types of buildings in the city. Green building design encompasses efficient energy, water, waste and material resources management; protection of environmental quality and health; reinforcement of natural systems; and integration of the design approach. Some of these elements may be applicable to open space planning (e.g. energy efficiency, green landscaping, water conservation, etc.) and building facilities (e.g. public washrooms).

» **Policy C567 (Green Building)** outlines the City's mandate regarding the promotion of the Green Building Plan to encourage the transformation to green buildings. Under the policy, the City of Edmonton will communicate, educate, and promote the benefits of green buildings, in addition to cooperatives, financial incentives, and bylaws created to support green buildings in the city. One potential method of implementing this policy would be to establish pilot "green building" projects in open spaces.

» **Policy C532 (Sustainable Building)** states that effective January 1, 2000, all new City-owned buildings and major renovations will be designed and constructed to meet LEED Silver Standard as a minimum, and will be formally LEED certified.

ENERGY TRANSITION

» **Policy C585 (Energy Transition Strategy)** outlines the City's mandate to become an energy sustainable city, including energy literate citizens, energy efficient buildings and industry, active and public transportation, energy efficient urban form, transport electrification, and sustainable energy generation and distribution.

» **The Community Energy Transition Strategy** identifies strategic courses of action for addressing energy and climate challenges and opportunities at the community level. Programs outlined in this strategy address energy efficiency and conservation in new and existing residential homes, community buildings, and industrial facilities. Some of the core programs may be applicable to open spaces (e.g. developing a CHP pilot program for City buildings/facilities).

CARBON EMISSIONS AND CAPTURE (CARBON NEUTRAL CITY)

» **Edmonton's Urban Forest Management Plan** is a 10-year strategy for sustainably managing and enhancing the urban forest, including all trees within city limits. The plan outlines short, medium, and long term strategies for promoting a healthy and sustainable urban forest. Maintaining a healthy, growing urban canopy has implications for climate regulation; the Green Network Strategy will be integral in supporting green open spaces.

» **The City Operations Green House Gas (GHG) Management Plan** outlines action plans to meet the City's goal of reducing GHG emissions from City Operations by 50% by 2020 (from 2008 levels; an 80% reduction by 2050; and eventual carbon neutrality). Some of the actions of the management plan are directly applicable to open space planning, such as decommissioning landfills to reduce GHG emissions from waste, and doubling the urban forest canopy by 2090.

» **The Carbon Dioxide Reduction Program** works with industries within the city to improve energy efficiency and reduce GHG emissions. Some projects initiated under this program may be applicable to open space, for example, industry-partnered GHG capture projects implemented on decommissioned landfills.

» **Policy C456A (Corporate Tree Management)** is intended to protect the tree canopy on City property by:

  • Ensuring the orderly development of the City's tree inventory through new plantings, replacement plantings, and proper maintenance in accordance with applicable bylaws.

  • Ensuring that all trees on City properties are adequately protected from destruction, loss or damage. Where salvage is not possible, equitable compensation will be provided to the City of Edmonton.

  • Providing for a tree reserve account that enables the carry forward of funds received for tree losses and/or damages. These funds will be used for planting trees on City property in the future.

  • Coordinating all City tree planting programs including boulevards, roadway landscaping, park and facility developments.

NATURAL AREAS CONSERVATION

It is important to recognize that all vegetation, both natural and non-native, contribute to ambient air quality, the capture of carbon from the atmosphere, and reduce the urban heat island effect. Therefore any plan or policy that encourages the replacement of heat-retaining and impervious surfaces with vegetative cover will also benefit climate mitigation. Therefore additional detail provided in the Biodiversity brief regarding the conservation and restoration of natural green cover will also apply to climate mitigation.

RELEVANT BY-LAWS

Bylaws can be created to address the sources of air quality contaminants in urban areas. For example, **Bylaw 15982** prohibits idling outside of schools and hospitals.

Relevant Projects & Programs Underway

There are many projects currently underway in the City of Edmonton that may help inform Edmonton's Green Network Strategy in terms of addressing the climate regulation function of open space. These are current projects that contribute to improved air quality, reduce the urban heat island effect, or otherwise directly and positively impact the urban climate. Projects related to the re-naturalization of open spaces are outlined in the Biodiversity Brief.

» **NAIT Solar Array Project**

» **Edmonton urban canopy climate resilience projects and research**

» **Citizen's Panel on Edmonton's Energy and Climate Challenges**

» **Edmonton's Community Energy Forum**

» **Regional Woody Plant Test Project**

» **Really Grate Tree Project**

» **Root for Trees**

» **Urban Forest Effects Model (UFORE)**

Relevant Funding Streams & Mechanisms

With the worldwide recognition of the impact of climate change on community sustainability and the mandate of federal and provincial governments to address these impacts, the availability of funding mechanisms to address climate issues will only increase. Some of the funding sources for municipal projects and programs related to climate change or air quality are indentified here. These are just some of the funding mechanisms available to increase urban green landcover, reduce greenhouse gas emissions, or address climate change impacts.

Federal Funding Sources

» **Sustainable Development Technology Canada (SDTC) Tech Fund** are grants awarded for clean-technology projects (development and demonstration).

» **Federation of Canadian Municipalities (FCM) Green Municipal Fund (GMF)** provides loans and grants for sustainable neighbourhood action plans, community brownfield action plans, feasibility studies, or capital projects related to retrofitting, construction, replacement, expansion, soil remediation, or brownfield, energy, waste, water, or transportation infrastructure.

» **Federal Gas Tax Fund** supports the development of public transit systems, and water/wastewater systems, solid waste management, community energy systems, and community capacity building.

» **Canada's Economic Action Plan - Green Infrastructure Fund** supports sustainable energy generation and transmission, and municipal wastewater and solid waste management infrastructure.

Provincial Funding Sources

» **Climate Change and Emissions Management Fund.** Provincial taxation applied under the Climate Change and Emissions Management Act is funneled into the Climate Change and Emissions Management Fund. The majority of the funding is then allocated to a non-government corporation, the Climate Change and Emissions Management Corporation, which administers the funding to support public and private projects that meet the objectives of the Alberta Climate Change Strategy (see below).

» **Alberta Innovates – Energy and Environment Solutions** is a funding agency and team of specialists dedicated to supporting technological solutions for reducing green house gas emissions, and increasing water and land conservation.

» **Alberta Ecotrust Grants** are community grants, major grants, multi-year grants, and youth environmental stewardship grants for projects that address pressing environmental issues in Alberta.

» **Municipal Climate Change Action Centre** includes two programs:

- Alberta Municipal Solar Program – financial rebates to municipalities that install solar photovoltaics on municipal facilities.

- Taking Action to Manage Energy – participants are eligible to receive an energy audit incentive to offset the costs of required detailed energy audits and implementation incentive to offset the costs of building retrofits.

City of Edmonton Funding

» **Energy Management Revolving Fund** is a $30 million fund for energy efficient project and retrofits, such as upgrading lighting, heating, cooling, and ventilation systems and envelope upgrades.

Other Funding Sources

» **Climate Change and Emissions Management Corporation (CCEMC)** is a non-government, independent organization that provides support and funding for greenhouse gas reduction programs. Funding priorities are aligned with the Alberta Climate Change Strategy: conserving and using energy efficiently, implementing carbon capture and storage, and green energy production. Municipal projects, private projects, university projects, etc. are all applicable.

Best Practices & Trends

Air Quality in Alberta

In the most recent Alberta Air Zones Report (2011-2013), four out of six air zones in the province were approaching the acceptable annual limits established by the Canadian Ambient Air Quality Standards for particulate matter and ground-level ozone. One of the six, the Red Deer Air Zone, exceeded those limits. In that report, for the North Saskatchewan Air Zone (which includes the City of Edmonton), further management action was recommended to address both particulate matter and ground-level ozone concerns. Of the 12 monitoring stations in that air zone, the City of Edmonton and the Town of Bruderheim (just north east of Edmonton) had the highest levels of particulate matter for all measurement time scales (24 hour and annual averages). Urban environments are challenged by the intensity of human activity they support, and therefore can be significant vectors for environmental quality concerns, including air quality. The City of Edmonton, as one of the largest urban centres in Alberta, with the second highest population growth in Canada (according to Statistics Canada), will face significant challenges with land, air, and water quality in the future.

1. HEAT ISLAND EFFECT

This imagery of the Greater Toronto Area in summer 2010 shows that surface temperature is much cooler in green spaces (turquoise and blue), like the ravine system extending from Lake Ontario, than in low-vegetation urban areas (red and yellow).

Source: Natural Resources Canada
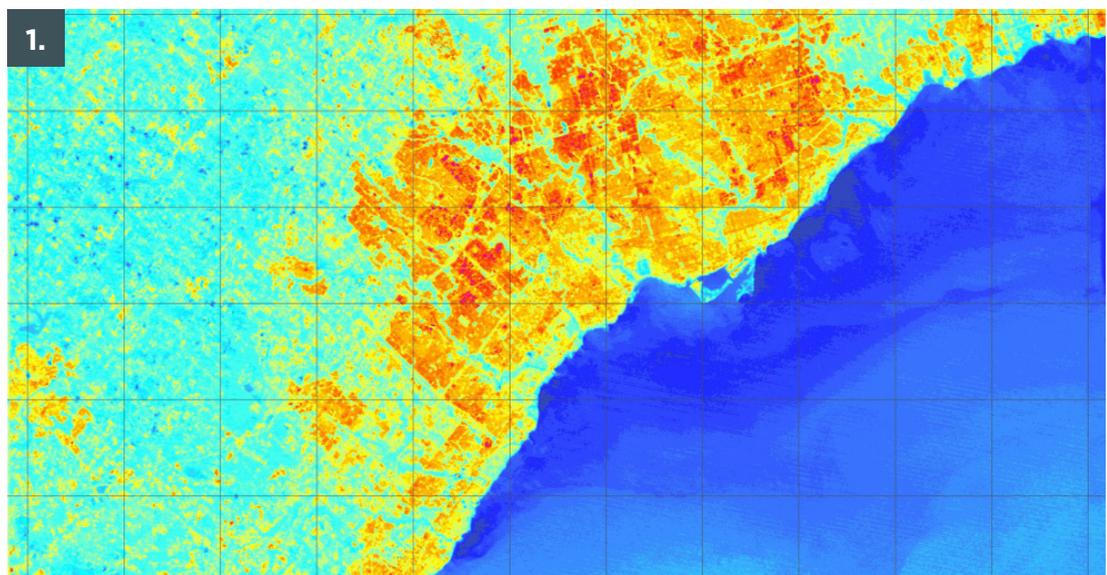
Mitigating Heat and Air Pollution with Green Space

The link between urban green space and air quality has been well recognized by researchers and managers alike. An analysis by the David Suzuki Foundation (The Impact of Green Space on Heat and Air Pollution in Urban Communities: A Meta-Narrative Systematic Review, 2015) found that the size, quality, and density of urban green spaces of all types (natural areas, tree canopies, green parks, green roofs, etc.) are positively related to overall urban air quality and human health. More importantly, it found that smaller, interconnected urban green spaces can provide greater cooling and air quality benefits than larger, but isolated green areas. In addition, varied landscapes with diverse vegetative species and compact multi-layering through the forest canopy had the greatest resiliency to drought, heat, and air pollution, but these types of green spaces were often limited in dense inner city neighbourhoods, and older neighbourhoods.

Other research has found that even small green spaces such as urban gardens or smaller neighbourhood parks can mitigate the urban heat island effect and improve air quality. It is not the size of the park that matters as much as overall green space density compared to impervious, heat-retaining surfaces such as concrete, asphalt, and brick. Urban tree canopy cover is an important mitigating factor, particularly for urban areas where more traditional, larger green space areas are not feasible. Trees can be planted in almost any urban environment, and have been shown to reduce the surface temperature of heat-retaining surfaces (concrete, asphalt, etc.) by up to 20°C during the day in the summer months compared to surrounding areas. This regulating effect may be increasingly important as global temperatures increase, and climate change results in more extreme summer temperatures.

The use of green space to regulate the environment can provide significant cost savings, and will improve overall environmental quality. At the strategic level, integrating green space and green land cover with other urban planning activities and recognizing the benefits of interconnected green infrastructure enhances the positive effects of vegetation on human health and well being.

Green Building Technologies

The green building technologies and products industry has been steadily growing over the last few decades. The demand for green building products has historically been primarily for large-scale buildings due to some technologies, such as solar power and geothermal, being cost-prohibitive. However, according to the Government of Alberta, as the technology costs decrease, private residents and residential developers have begun using them for residential homes. In fact, it is estimated that the rate of growth in the residential green building market will begin to outstrip that of the non-residential sector within the next 10 years. This growth is being driven by higher energy prices, declining resources, increasingly stringent environmental regulations, and the prevalence of environment-driven health problems such as cancer, allergies, and asthma that have been linked to environmental quality and contaminant exposure.

Incentives, such as an energy or water conservation program, can be leveraged at the strategic planning level to encourage the use of green building technologies for new developments. For example, green building technologies can be applied to municipal development projects on publicly accessible spaces, such as solar-powered canopies for parking lots, LEED standards applied to recreational facilities, low-energy park space lighting, low-flow toilets in public washrooms, or green roofs on public event spaces. It may also be appropriate to establish objectives for implementing green building standards on new or existing park facilities (e.g. replace all light bulbs in park space facilities by energy efficient CFL lighting over the next 5 years).

Climate Change and Carbon Policy

The longer, hotter summers predicted by climate models will generate warmer surface temperatures, particularly in urban environments with an abundance of heat-retaining surfaces. These increased temperatures will magnify the urban heat island effect; accelerate the formation of ozone; and likely result in increased smog. In addition, some vegetative species traditionally used for urban landscaping may not be resilient to some of the effects of climatic change, such as extreme temperature and

rainfall events. Poor adaptation may leave certain species vulnerable to pest infestations and other problems, presenting a financial and management risk in the future. Simultaneously, changes in government policy could impact the ability of urban centres to respond to increasing population pressures and the resulting increased demand on energy and transportation. The federal government has committed to adopting more effective climate change policies with increasing limits on carbon emissions over time. The provincial government in Alberta has also committed to reducing carbon emissions and creating a new carbon taxation scheme for Alberta. These commitments reflect a changing attitude towards climate change, with a recognition that measurable actions must be taken to reduce risk and improve community resilience.

The nexus of increasing limits on carbon emissions, carbon taxation, and increasingly severe impacts from climate change will present a significant challenge to urban planning and management. How the City of Edmonton integrates green space and green infrastructure into city-level planning will have a significant impact on community resiliency and the ability of the City to respond to climate change going forward.

Precedents

The use of urban infrastructure to mitigation climate change and improve air quality has been the subject of many university and research centre studies. Some relevant case studies where green infrastructure was integrated in open space planning to address climate issues, or where development policies were used to incentivize green infrastructure or green landcover were identified in Adaptation to Climate Change Using Green and Blue Infrastructure, University of Manchester, 2010:

» **Toronto:** "Ahead of the Storm" - development of the climate change adaptation action plan.

» **Stuttgart:** Combating heat island and poor air quality with green aeration corridors.

» **Slovakia:** Development of open space standards related to climate change and water management.

» **New Orleans:** Preserving the wetlands in urban areas to increase climate change resilience.

» **Dorset:** Financial contributions of planning applications for prevention of heathland fires

» **A Climate Change Action Plan for North West England**: exploring the position of green infrastructure.

» **Basel:** Building regulations for green roofs.

» **Chicago:** "Green Permit Program" – incentives for developers to install green roofs.

» **Nagoya:** Adaptation to climate change driven by biodiversity conservation.

2. NEW ORLEANS MANGROVE FOREST

After Hurricane Katrina inundated the city in 2005, New Orleans and surrounding counties have been preserving coastal wetlands as a means of climate and flood mitigation.

Source: livingwithwater.com

2.
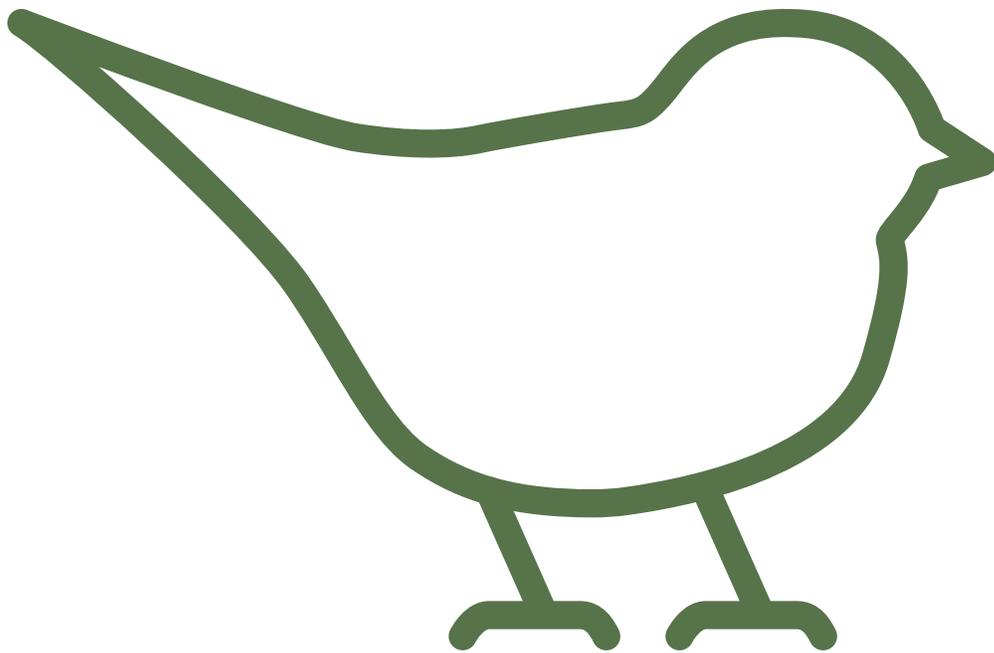
Biodiversity

Not limited just to preservation and conservation lands, many types of open space provide habitats for plants and animals that can help ensure biodiversity and wildlife connectivity. Effective and appropriate management and regulation of these spaces is crucial to integration with other open space functions.

Key External Stakeholders / Organizations

The City of Edmonton works with many key stakeholders and organizations that support ecosystem conservation and biodiversity at the federal, provincial, and city-wide level. This includes stakeholders who are involved with wildlife management, natural area conservation, the promotion of green landcover, and the naturalization of urban spaces.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can help to manage and improve biodiversity not just in Edmonton, but in the region as a whole.

Canadian Forestry Service

Pest Management Regulatory Agency

Alberta Environment and Parks (AEP)

Alberta Tourism, Parks, and Recreation

Alberta Biodiversity Monitoring Institute

Alberta Conservation Society

Alberta Environmental Network

Alberta Land Trust Alliance

Alberta Riparian Habitat Management Society (Cows and Fish)

Alberta Water Council

Canadian Parks and Wilderness Society (CPAWS) Northern Alberta Chapter

Convention on Biological Diversity

Ducks Unlimited Canada

EcoCity

Edmonton and Area Land Trust

Edmonton Bird Club

Edmonton Horticultural Society

Edmonton Native Plant Group

Edmonton Nature Club

Edmonton Naturalist Society

Edmonton Natural Areas Advisory Committee

Environmental and Outdoor Education Council

Evergreen

Federation of Alberta Naturalists

Green Communities

International Union for the Conservation of Nature (IUCN)

Local Governments for Sustainability

Nature Alberta

Nature Conservancy of Canada

North Saskatchewan Watershed Alliance

PLUS Network

Society to Prevent Dutch Elm Disease

The North Saskatchewan River Conservation Society

The Sierra Club

Toxics Watch Society of Alberta

Urban Development Institute

Wildlife Rehabilitation Society of Edmonton

Relevant Plans & Policy

Healthy ecosystems provide the basic necessities of life: food, clean air, clean water, shelter, and mental well being. A key measurement of ecosystem health Is biodiversity – the degree of variation of life forms within a given ecosystem. Greater biodiversity can represent greater ecosystem health, and certain ecosystems with greater biodiversity have the potential to offer a greater number of ecological services such as nutrient cycling, carbon capture, food production, regulating the urban environment (temperature, clean air), water management, and many others. The systematic loss of biodiversity through the development of supporting landscapes, such as converting natural areas to cropland or urban space, should be recognized as a risk to human health. Secondary impacts to healthy ecosystems from human activity must also be recognized, such as soil and water contamination, climate change, habitat fragmentation, alteration of natural drainage systems, and the introduction of invasive species, all of which impact biodiversity through intersecting and additive ways.

This brief will explore three central themes regarding biodiversity in open spaces:

» Conservation of natural habitats;

» Re-naturalization of open spaces; and

» Control of invasive species.

Each summary provided below seeks to answer two key questions: "What is the purpose and scope of this policy/plan?" and "How is it relevant to the biodiversity function of open spaces at the strategic planning level?"

Federal Acts, Policies, and Guidelines

Federal Acts, policies and guidelines that support or protect biodiversity provide a basis for provincial and municipal strategies to conserve natural areas. In addition, some federal regulations protect certain vulnerable species directly and are applicable to all projects, programs or plans that have the potential to impact important wildlife habitat.

CONVENTION ON BIOLOGICAL DIVERSITY (1992)

The Convention is a treaty that was signed by 150 government leaders, including the Canadian Federal Government, at the 1992 Rio Earth Summit. The treaty is intended to establish a common understanding and set of principles that support sustainable development and the preservation of biodiversity. The treaty has three main goals:

» The conservation of biodiversity;

» Sustainable use of the components of biodiversity; and

» Sharing the benefits arising from the commercial and other utilization of genetic resources in a fair and equitable way.

The treaty also outlines measures and incentives for the conservation and use of biological diversity, technical and scientific cooperation, impact assessment, education and public awareness, provision of financial resources, and national reporting, among other priorities. The Convention offers a set of principles for the preservation of biological diversity which can be adapted at a strategic planning level to inform and support the Green Network Strategy.

CANADA WILDLIFE ACT

The Canada Wildlife Act allows for the creation, management, and protection of wildlife areas for wildlife research activities, or for conservation or interpretation of wildlife. The purpose of the Act is to preserve wildlife habitats that are critical to migratory birds and other wildlife species, particularly those that are at risk. The Wildlife Act therefore prohibits all activities that could be harmful to species and to their habitat unless a permit is issued for the activity. In general, the Canada Wildlife Act applies to federally-managed wildlife areas (National Wildlife Areas), which are designated under the Act. The Wildlife Area Regulations were established under the Canada Wildlife Act to identify activities which are prohibited in National Wildlife Areas. There are no National Wildlife Areas within or directly adjacent to the City of Edmonton, although the principles of the Act regarding preventing undue harm to wildlife from human activity may be applicable to protected natural areas with the city.

MIGRATORY BIRDS CONVENTION ACT (1994)

The Migratory Birds Convention Act protects migratory bird species from undue harm from human activity. Under the Act it is unlawful to capture, kill, scare, hunt, or possess a migratory bird, nest, or egg, unless granted a specific permit to do so for commercial hunting, educational, or scientific purposes. Any activity that could potentially harm or disrupt nesting migratory birds is also prohibited, such as the removal of nesting trees or the deposition of harmful substances in waters frequented by migratory birds. In general, human activity that may disrupt nesting areas are restricted during the bird nesting period, i.e. restricted activity periods (RAPs). General RAPs have been developed by Environment Canada for migratory birds in general, while species-specific RAPs have also been developed for species at risk under the Species at Risk Act (see below). Restricting, directing, or discouraging certain human behaviours during sensitive nesting periods may be appropriate within or adjacent to open spaces with high nesting bird habitat potential. For example, creating a noise buffer between areas with high habitat potential and major transportation corridors may improve migratory bird residence.

SPECIES AT RISK ACT (2002)

The Species at Risk Act (SARA) is intended to protect certain wildlife species from undue harm from human activity. While it is focused only on certain wildlife species rather than protecting biodiversity in general, by protecting sensitive wildlife species the Act supports the preservation of biodiversity in key habitat areas. Wildlife species protected by SARA include only those listed in the Act, a list which is established, reviewed, and updated by the Committee on the Status of Endangered Species (COSEWIC). Prohibitions under the Act apply to endangered, threatened, or extirpated species and include harming, collecting, or trading individuals or destroying their residence (habitat). In general, the Species at Risk act is enforceable primarily on federal lands and for aquatic species. However, the Province of Alberta has adopted wildlife protection regulations based on the federal Species at Risk Act. Identifying critical habitat areas for species at risk within open spaces will provide an opportunity to improve biodiversity.

IMPORT/EXPORT REGULATIONS

The import and export regulations of Canada protect biodiversity by prohibiting the export of rare or endangered species and preventing the import of invasive species (plants, wildlife, invertebrates, bacterial pests, etc.). Separate regulations and management plans exist for each invasive, and control measures include inspections, phytosanitary requirements, and the prohibition of importing certain plants or plant materials. Green space landscape design guidelines for municipalities should take account of federally-listed pests. While it is unlikely that any of these species will be available from local suppliers, it is important to recognize that horticultural pests can spread from gardens to natural areas where they could impact the health of natural ecosystems.

Provincial Acts, Policies, and Guidelines

Provincial policies and guidelines related to biodiversity include plans or policies that directly protect species at risk, or manage invasive species that reduce biodiversity in natural areas.

ALBERTA`S STRATEGY FOR THE MANAGEMENT OF SPECIES AT RISK (2009-2014)

Alberta`s Strategy for the Management of Species at Risk is based on the Convention for Biological Diversity (1992) and the National Framework for Species at Risk Conservation. The strategy recognizes that species at risk are the most vulnerable components of Alberta`s biodiversity, and that by protecting species at risk, Alberta is also protecting the ecosystems and habitats on which they are dependant. The goal of the strategy is to ensure that populations of all wild species are protected from severe decline and that viable populations are maintained or restored. Strategies for achieving this goal include establishing provincial protection status for species at risk; recovery planning; risk prevention; and recovery and management actions. A key mechanism for achieving the goals of the strategy are the regulations established under the Alberta Wildlife Act. The priorities of the Green Network Strategy should be aligned with the goal of the Species at Risk Strategy, specifically to preserve or restore biodiversity where possible through the strategic management of open spaces.

ALBERTA WILDLIFE ACT (2000)

The Alberta Wildlife Act governs both the protection and sustainable management of wildlife in Alberta, including the protection of threatened/endangered species, the hunting of wildlife, and permissions to harm or disrupt wildlife through permitting and licenses (or penalties for harming wildlife without permitting/licenses to do so). Under the Act it is unlawful to harm, collect, or kill an animal (or its den or nest) without a license from the province. Some specific exemptions from permits to harm wildlife exist for species listed as endangered or threatened under the act. At the strategic open space planning level, provincially-recognized species at risk may require special management considerations, and the Act may apply to any plans or policies related to recreational hunting in publicly accessible areas, e.g. prohibiting hunting activities on open spaces within or adjacent to the City of Edmonton where federally or provincially recognized threatened/endangered species are known to occur.

ALBERTA WEED CONTROL ACT (2010)

The Alberta Weed Control Act regulates invasive plant species such as noxious and prohibited weeds and their seeds. Control measures such as inspection and enforcement of prohibitions, and the mandating of licenses for seed cleaning plants and mechanisms are included in the Act. The Act also mandates that all persons shall control a noxious weed that is on land the person owns or occupies, and shall destroy a prohibited noxious weed on their land.

There are three main challenges with relying on the Weed Control Act for controlling invasive plants. First, some common ornamental plants loved by gardeners and landscapers are actually listed as noxious or prohibited species (pale yellow iris, flowering rush, purple loosestrife, baby's breath, ox-eye daisy, and others), and these plants are often planted and start to spread before it is recognized that they are prohibited. Education plays a vital role in preventing the spread of these species. Second, it takes time to identify new invasive species and update the regulations accordingly, while thousands of new plant species are being developed, bred, or imported every year. Third, urban areas are a hot spot for gardening activities that use non-native plants. Any plant that is not endemic to the local ecosystem of the region has the potential to impact the biodiversity of natural areas, and may proliferate and act like an invasive species once spread to a natural area even if the plant is not generally considered noxious. Municipal policies that encourage the use of native plants in local gardens will reduce this risk and protect biodiversity: public green spaces can present an opportunity to demonstrate the use of native plants in landscape design, and for non-traditional gardening purposes (e.g. native plants for turf; naturalized mini-bioswales using native plant species to control surface runoff; xeriscaping with native plant species).

City of Edmonton Plans, Policies, and By-Laws

In **The Way We Green**, the City of Edmonton recognizes that community sustainability and resilience is inherently tied to the health of global and local ecosystems. The plan recognizes the need to mitigate the effect of urban growth on important ecosystem services such as soil formation, recreational opportunities, climate regulation, and crop provision. To address the loss of those services, Edmonton will need to take action in a number of areas, including prioritizing the protection of at-risk natural and agricultural areas, and increasing the urban forest, among others.

One of the actions identified in the Plan to address the value of the green network is Strategic Action 3.1.9, which calls on the City to adopt a leadership position, together with the provincial and federal governments and other local authorities, in implementing Section X/22 of the United Nations Convention on Biological Diversity. The Green Network Strategy must align with this priority, and the other goals and key actions of The Way We Green, to ensure the protection of key ecosystem services and enhance biodiversity throughout the city.

Additional City of Edmonton strategies, plans, and policies are outlined below as they relate to biodiversity, the preservation and restoration of natural areas, and the North Saskatchewan River Valley and ravines.

NATURAL CONNECTIONS STRATEGIC PLAN

The Natural Connections Strategic Plan is the City of Edmonton's conservation plan for the protection and restoration of natural areas to preserve city-wide biodiversity. The primary purpose of the plan is to ensure that all natural areas in Edmonton are managed using a network approach that consider them as a functional unit, not as individual parks. The focus is on strengthening connections between natural areas by establishing functional biological corridors, and strengthening connections between people by creating partnerships that empower Edmontonians to work together to protect Edmonton's natural systems.

The Plan recognizes that the people of Edmonton live in an interconnected and interdependent system with both natural and human components, and that the activities and health of one affect the activities and health of the other. The Green Network Strategy will build on the concepts, principles, and actions detailed in this Plan and its foundational City policies as they relate to open space, and will bring them forward to strategically conserve and restore the biodiversity function of Edmonton's open spaces.

BIODIVERSITY ACTION PLAN

The Action Plan is the implementation component of Natural Connections. It builds on the commitment to conserve, protect, and restore Edmonton's biodiversity, to balance ecological and environmental considerations with economic and social considerations, and to conserve and restore the natural areas of Edmonton using a systems approach that recognizes the value of supporting an ecological network. Key challenges include land development pressures and limitations in regional cooperation, public awareness, and municipal powers to protect land. To address these challenges, the Plan proposes to:

» Expand Edmonton's ecological network through securement and restoration;

» Increase the City's capacity for conservation planning;

» Support a system of shared conservation education;

» Enhance Edmonton's culture of ecological innovation and excellence;

» Increase the accessibility and integration of information;

» Increase the City's capacity for the management of natural areas; and

» Build a well-connected network of conservation partners.

The priorities and recommendations of the Green Network Strategy will need to be aligned with the key directions of the Biodiversity Action Plan. In addition, some of the key priorities identified in the Biodiversity Action Plan may be relevant and applicable to the Green Network Strategy (e.g. identify new funds for natural areas protection).

CITYWIDE NATURAL AREA MANAGEMENT PLAN

Under the Conservation Policy C-467 (1998), the City of Edmonton required that a management plan be created for all natural areas protected by the City. However, this method did not necessarily support a systems approach to conservation at the city level, and so the City-Wide Natural Area Management Plan was created to address conservation planning for both city upland areas, and the North Saskatchewan River Valley and ravines. New protected area plans are completed under section 4.3 of the Citywide Natural Area Management Plan to ensure consistency across all natural area plans within the city in terms of planning principles and management strategies.

While natural area management plans are established on a site by site basis, the Green Network Strategy supports and aligns with the objectives and guiding principles of the Plan: protecting vulnerable plant species, controlling the spread of invasive species, increasing overall biodiversity, minimizing impact to wildlife from human activity, ensuring safe walking trails and publicly accessible areas, maintaining park infrastructure, managing waste, supporting educational opportunities, and maintaining vistas and viewpoints.

RIBBON OF GREEN CONCEPT PLAN AND MASTER PLAN

The Ribbon of Green Concept Plan recognizes the North Saskatchewan River Valley and its associated ravines as a significant cultural, social, and environmental landscape and the

importance of protecting it from development. The Plan proposes a tripling of the urban park along the North Saskatchewan River within city limits to encompass the entire river valley and associated ravines. The plan includes a land acquisition strategy, and a recommended financing strategy, to accomplish this goal. To balance public use of the valley and the protection of natural landscapes and wildlife habitat areas, the Plan establishes three land management zones to reflect each category of use (Preservation, Conservation, and Extensive Use).

The Master Plan establishes guidelines and standards for policies and site plans developed as part of the Ribbon of Green Concept Plan. Under the Master Plan a review system, classification system, and project management guidelines are established for all projects within the North Saskatchewan River Valley and ravine system in a three-phased approach that identifies priority areas for park development. The plan addresses development and park design concerns such as accessibility, trail development, park amenities, programming, and interconnectivity to other parks and trail systems outside the river valley.

Because the Ribbon of Green Concept and Master Plan outline the overall strategy for open space management in the North Saskatchewan River Valley and ravine system, it is a foundational document for the Green Network Strategy. While some of the original information included in the Ribbon of Green Concept and Master Plan may need to be updated, the founding principles of balancing park space development with natural area preservation are still relevant.

NORTH SASKATCHEWAN RIVER VALLEY AND RAVINE ENVIRONMENTAL REVIEW SYSTEM

Within the North Saskatchewan River Valley Area Redevelopment Plan (ARP) boundaries, most development activities are required to go through environmental review, which includes an initial project review; an environmental screening; and an environmental impact assessment. The purpose of the review process is to identify and mitigate environmental impacts prior to any development activities, thereby ensuring an opportunity to address actions which might impair ecological function and negatively impact biodiversity.

RIVER VALLEY ALLIANCE PLAN OF ACTION

The River Valley Alliance is a partnership between seven municipalities in the Alberta Capital Region that are committed to preserving the North Saskatchewan River Valley. The Plan of Action views the entire river valley as a single regional, riverfront park, and calls for cooperation between its partners to protect the river valley from development pressures. The Plan of Action includes environmental, social, and economic objectives such as:

» Preserve natural land in the Capital Region River Valley Park;

» Respect important wildlife habitat and movement corridors;

» Enhance the public's understanding of the environmental health and importance of the Capital Region River Valley Park;

» Use trailways and waterways to connect communities and attractions along the valley and from the park to surrounding communities and attractions;

» Reflect the cultural and natural heritage of the river valley and expand education opportunities based on the park's natural and cultural history;

» Support an active and healthy lifestyle for people in the Capital Region; and

» Enhance the urban experience in the Capital Region by creating connections to the park and providing venues for cultural, arts, athletic and entertainment-related activities.

The objectives of the Plan of Action align well with the central themes of the Green Network Strategy: Ecology, Wellness, and Celebration. Since interconnectedness and a systems approach to open space management is central to the objectives of the Green Network Strategy, it is important to integrate the broader regional context of the river valley into the considerations and priorities of the Green Network Strategy. Consideration will be given to the seven planning areas of the Capital Region River Valley Park, and the strategy will also consider the Plan in relation to natural area conservation and management, adventure attraction, environmental education, recreation, urban amenity, heritage interpretation, and environmental restoration.

RIVER ACCESS STRATEGY

The North Saskatchewan River Valley River Access Strategy focuses on river use and its associated infrastructure (roads, trails, boat launches, etc.). It provides guidance on development, locations, and use of river recreational facilities, as well as identifying a number of strategies and implementation actions to protect the environment while providing adequate access to the river for recreational opportunities. The River Access Strategy is governed by provincial and federal policies related to water quality and quantity and fish habitat protection, which are outlined in the Water Management Brief. Outdoor recreational opportunities are explored in detail in the Recreation Brief.

The River Access Strategy supports river valley conservation by directing use of the North Saskatchewan river (and access to the river) in a way that minimizes disturbance to sensitive ecosystems by designating protection zones; identifying appropriate river use; monitoring changes and impacts to the river; ensuring restoration is undertaken where necessary; and promoting awareness and good practices for water quality protection and river use.

PARKS AND RIVER VALLEY CONSERVATION REPORT

The Parks and River Valley Conservation Report assessed the natural areas within the City of Edmonton in order to prioritize conservation efforts, establish site-specific conservation strategies, develop a strategy to enhance natural areas awareness and education, and develop an appropriate fund raising strategy to support the longer term goal of conserving important components of Edmonton's natural heritage. Important lessons learned in terms of weaknesses and challenges with the current policy framework for natural area conservation were also identified in the report. Many of these challenges are still relevant to broader open space planning and management city-wide, and will be applicable to the Green Network Strategy (e.g. managing public access to conservation areas; funding and financial constraints, etc.).

POLICIES, BYLAWS, AND DEVELOPMENT GUIDELINES

Building on the numerous strategies related to natural area conservation and the North Saskatchewan River Valley and Ravines, the City of Edmonton has developed a number of policies, bylaws, and development guidelines that support or enhance ecosystem function and biodiversity in the city.

» **Policy C-467 Conservation of Natural Sites in Edmonton's Table Lands** is intended to "enhance the liveability, attractiveness, and bio-diversity of Edmonton and ensure consistent, uniform and equitable conservation of natural sites" by conserving environmentally sensitive areas (ESAs) and significant natural areas in discharging Corporate duties; retaining and integrating natural areas through the planning and development process; and conserving the four regionally significant ESAs on the table lands and other significant ESAs in the River Valley. The goal is to conserve as many environmentally sensitive and significant natural areas as sustainable and feasible.

» **Natural Area Systems Policy C531** recognizes the importance of balancing ecological and environmental considerations with economic and social considerations in City planning and operations. The policy commits the City of Edmonton to lead by example, and engage the public, businesses, residents, and the community in natural area issues and stewardship.

» **Environmental Policy C512** states that the City of Edmonton, through its planning, decision-making processes, and leadership, will promote the development of an environmentally sustainable community that functions in harmony with the natural environment and commits the City to preventing pollution; continually improving its environmental performance by setting and reviewing environmental objectives and targets; and meeting or exceeding environmental legal requirements.

» **Wildlife Passage Engineering Design Guidelines** were designed to provide transportation designers and decision makers with recommendations that incorporate the needs of wildlife into transportation projects. These guidelines are intended to reduce habitat fragmentation and support wildlife movement through the city.

» **City of Edmonton North Saskatchewan River Valley Area Redevelopment Plan (Bylaw No. 7188)** requires the assessment and review of development activities or construction that would impact designated areas within the River Valley and Ravine System against a set of policies and development approval procedures. The goal of this bylaw is to preserve the natural character and environment of the North Saskatchewan River Valley and ravine system.

» **Policy C542 Development Setbacks from River Valley Ravine** establishes appropriate setbacks from the river to ensure preservation of the River Valley and Ravine System as a significant visual and natural amenity feature and an important contribution to the ecological function of the city's natural areas system.

» **Policy C307 Parkland and River Valley Utility Installation** states that damage to City of Edmonton Parkland, including the North Saskatchewan River Valley, incurred though utility installations will be minimized.

» **Policy C586 River Access Guiding Principles** recognizes that the enjoyment, use and protection of the North Saskatchewan River is important to Edmontonians' quality of life. The City of Edmonton will ensure environmental stewardship while encouraging a broader appreciation for activities on or alongside the river, and will provide direction regarding the safe use, programming, partnerships, operations, design and location of infrastructure that supports access to the river and activities associated with the river.

» **Parkland Bylaw 2202** regulates the conduct and activities of people on parkland in order to promote the safe, enjoyable and reasonable use of such property and to protect and preserve natural ecosystems.

» **Zoning Bylaw (Bylaw 12800)** includes a set of regulations that govern the development of land in the City of Edmonton. Zoning applicable to open spaces includes Natural Areas Protection, Metropolitan Recreation, and Public Parks Zones.

» **Herbicide-Free Sites.** The city has 45 designated 'Herbicide-Free' parkland areas where herbicide use is restricted or reduced depending on current site conditions.

» **Community Standards Bylaw (Bylaw 14600)** regulates the maintenance of private property and includes provisions for the removal, pruning, and disposal of elm trees in addition to designating restricted, noxious, and nuisance weeds with specific management requirements.

» **Edmonton Integrated Pest Management Policy C501** limits the use of pesticides on City property to ensure safe, healthy urban environments for city residents. Under this policy, non-chemical and preventative pest management is preferred over pesticide use for the management of pests on City property, and when necessary, the least toxic approved pesticide must be used. The policy also insists on the adoption of Integrated Pest Management principles by all City departments involved in pest management.

Relevant Projects & Programs Underway

There are many projects currently underway in the City of Edmonton that may help inform Edmonton's Green Network Strategy in terms of addressing the biodiversity function of open space. These are current projects that preserve natural areas, identify ecologically valuable green space, or directly increase biodiversity in the city.

» City of Edmonton **Naturalization Program** Projects:

  • Stage 1: 91 Street; Terwillegar Drive; 51 Street & 52 Avenue; Manning Drive

  • Stage 2: Hermitage Park; Victoria Park Hill; Government House Park; Louise McKinney Park; Whitemud Drive; Yellowhead Highway; Twin Brooks Park; Hazeldean Park.

  • Stage 3: Gold Bar Park; off-leash parks; River Valley / Ravine areas.

» **Root for Trees**

» **University of Alberta and City of Edmonton Naturalization Research Project**

» **Environmental Sensitivities Mapping Project**

1. PRAIRIE BUTTERCUP

The Native Perennial Garden at the John Janzen Nature Centre is a good demonstration of biodiversity in Edmonton's natural ecosystems.

Source: Edmonton Master Naturalists for Nature Edmonton blog

2. INVASIVE WEED PULL

Volunteers pull invasive garlic mustard.

Source: Edmonton Master Naturalists for Nature Edmonton blog

3. LOUISE MCKINNEY PARK

The bank to the right of this path is being naturalized.

Source: City of Edmonton

» **River Valley Alliance Projects**

  • Terwillegar Park Footbridge

  • West End Trails

  • East End Trails

  • Boat Docks and Launches

  • Mechanized Access and Touch the Water Promenade

» **Borden Park Revitalization Plan**

» **Wildlife Passage Projects / Engineering Design Guidelines**

» **John Janzen Nature Centre: Native Perennial Demonstration Bed**

» **Valley Line LRT**

» **Master Naturalist Progra**m

» **Urban Biokit**

» **Plantwatch**

» **Integrated Pest Management Projects**

  • Weed Biocontrol

  • Weed Pulls

  • Weed Identification and Reporting Application

Relevant Funding Streams & Mechanisms

There are many federal, provincial, and other funding sources for enhancing biodiversity and conserving natural areas. Some of these are specific to the protection of endangered species, while others are more general funding sources for protecting wildlife habitat.

Federal Funding Sources

» **The Endangered Species Recovery Fund (Environment Canada and World Wildlife Fund)** is available to non-government organizations such as universities, natural history societies, research institutes and non-profit conservation groups for projects to recover species at risk.

» **Habitat Stewardship Program for Species at Risk** allocates funds to projects that conserve and protect species at risk and their habitats and help to preserve biodiversity as a whole. These funds promote the participation of local communities to help with the recovery of species at risk and preventing other species from becoming a conservation concern. Municipal governments can apply.

» **Environmental Damages Fund** allocates funds from environmental damages compensation to the government of Canada, with a focus on projects that restore natural resources, or wildlife conservation projects. Municipal governments can apply.

» **Aboriginal Fund for Species at Risk** grants are allocated to projects that protect habitat and contribute to the recovery of species at risk, as well as to projects that prevent other species from becoming a conservation concern. Only Aboriginal groups can apply unless sponsored by an Aboriginal group.

» **EcoAction Community Funding Program** is funded by Environment Canada to address environmental issues in communities. Non-profit organizations are eligible (municipalities are not directly eligible). Applicable issues include clean air, clean water, climate change, habitat restoration and conservation.

Provincial Funding Sources

» **Watershed Resiliency and Restoration Program** provides grants for natural, non-structural flood and drought mitigation projects (formerly the Flood Recovery Erosion Control Program).

» **Alberta Conservation Association Research Grant** funds high quality research projects on wildlife, fish and habitat which inform the effective management of wildlife, fish populations, and habitat in Alberta carried out by professional researchers.

City of Edmonton Funding

» **EcoCity Edmonton Community Sustainability Grants** provide three streams of funding for projects that address climate change and energy, nature and land use, water, and air issues.

Other Funding Sources

» **River Valley Alliance Funding**

» **Alberta Ecotrust Foundation Grants**

Best Practices & Trends

Preserving Natural and Undeveloped Green Spaces

While modified and urbanized natural areas and man-made green spaces do provide important wildlife habitat and vegetation species, in general undeveloped green spaces with a variety of undisturbed native vegetation still offer the greatest biodiversity. One study of the biodiversity in urban landscapes by the National Science Foundation found that cities support 92% fewer bird species and 75% fewer native plant species compared to undeveloped areas. Natural areas within the urban landscape are therefore critical for providing habitat, although non-native vegetation and man-made green space can provide important ecological functions as well. The idea that different types of green space can have higher or lower ecological value has resulted in a trend towards ecological inventorying and scoring of green space within urban environments to determine which green spaces provide more ecological value.

4. OAK RIDGES MORAINE

The Oak Ridges Moraine, a protected natural land form in southern Ontario, provides not only drinking water for much of the Greater Toronto Area, but also a connected green habitat for flora and fauna.

Source: Bill Lishman via durhmaregion.com

5. DEER HABITAT ADAPTATION

Golf courses are developed green spaces that displace natural ecosystems and become "home" for many species, like deer, that can adapt to a new habitat.

Source: Don DeBold via Flickr.com

6. GARLIC MUSTARD

Garlic mustard (*Alliaria petiolata*) is a common invasive species in North America, and is designated a Prohibited Noxious plant in Alberta. It produces a toxin that inhibits the growth of other plants.

Source: New York Invasive Species Information

Green Space Ecological Valuation / Scoring

The concept of ecological scoring is based on the idea that different types of urban green space can provide different levels of ecological service. Proximity to other green areas, age, vegetation types and vegetation stratification, presence of invasive species, overall vegetation health, level of human activity and disturbance, soil quality, and other factors can influence the amount of biodiversity that a given green space supports. Research into urban green space biodiversity supports a multitude of analytical tools to score or evaluate the biodiversity of green space based on conservation biology or ecology principles, which include habitat suitability analysis for specific wildlife species, landscape metrics and connectivity analysis, landcover classification, and the use of direct biodiversity metrics such as species richness, biodiversity indices, and other measurements of species, ecological, morphological or genetic diversity. The idea is to score or rate different types of green space, from urban forest canopies, green roofs, parks, and undeveloped fields to natural areas and nature reserves based on the number, quality, and type of ecological services they provide and how they contribute to biodiversity.

Vulnerable Species as Indicators for Biodiversity

Another method of measuring or quantifying biodiversity in green spaces is to look at the presence and abundance of vulnerable species or critical habitat for vulnerable species. This would include regionally rare species, species at risk (endangered, threatened, or other federally listed species), key ecosystem species, common species in decline, or change-sensitive species. In many cases it is not practical or feasible to survey all the potential wildlife in an area and determine how they are using the green space, but it may be possible to have a detailed study focused on one or two 'indicator' species. By identifying and measuring the most sensitive or vulnerable species in an area and creating policies that protect that species you are in fact protecting biodiversity in general under the premise that less-sensitive species will also be protected. In this same manner, areas with species at risk are often given priority for protective actions, not just because they are federally or provincially protected.

Green Space Connectivity

Another important emerging concept for measuring the ecological value of green space is the idea of habitat connectivity. Measurements such as patch size, adjacency to other green space, barriers to wildlife movement, level of disturbance, land cover, and habitat structure/stratification can all be used to assess how one parcel of green space functions in the overall regional ecosystem. The founding principle posits that important habitat areas that are isolated will have reduced ecological value compared to habitat areas with "stepping stones" or other connections to nearby green spaces, since migration and movement is an important part of most species' life cycle. Fragmented habitats therefore have impaired ecological function compared to intact ones because they interfere with the function of the ecosystem as a whole.

Urban Ecosystems and Wildlife Adaptation to Urban Environments

The idea that pristine, undisturbed natural areas are the best and only way to preserve biodiversity is becoming outdated. Urban ecosystem theory is based on the understanding that human and ecological health and wellness are not mutually exclusive, and that built environments can offer meaningful and important habitat for plants and animals as well as humans. Some wildlife find urban habitat highly suitable, and some are readily able to adapt to increasingly "urbanized" human landscapes. In some cases this adaptation results in wildlife becoming a nuisance. For example, feral pigeons, jackrabbits, rats, and seagulls are some well-known species that are prolific in the urban environment. Managing wildlife in the urban environment can be a challenge, but it is an important indicator of the integration between the natural and the built environment.

Invasive Plant Species

Wildlife are not the only nuisance species in urban environments. Invasive and noxious plants are more than just a nuisance in urban environments: they can actually replace native species that provide more ecological benefit and in extreme cases, create monocultures that directly reduce biodiversity. Unfortunately, due to the prevalence of residential gardening and urban landscaping using non-native plant species, the introduction of invasive nuisance plants into otherwise natural areas is a common and recurring problem in urban environments. Chemical control of weedy species often seems the simplest and most direct method to address the spread of nuisance plants, but it is not always the most effective. Integrated pest management addresses nuisance plants at the systemic level through prevention (prohibiting nuisance plants), control (removing nuisance plants), and replacement (replacing invasive plants with alternatives).

Precedents

Recognizing the value of ecosystem services is a common theme in urban open space planning, but how this value is integrated into city-wide planning is a greater challenge. Many municipalities have addressed this challenge in unique and innovative ways, and there are numerous case studies available for comparison. One such example is provided below for three different best practices described in this brief: green space ecological valuation / scoring, preserving biodiversity in the urban landscape, and addressing invasive species risk through careful plant selection.

Ecosystem Services Study | Australia

A study completed by the Australian Government – Ecosystem Services from Large Urban Green Spaces: The Biodiversity and Carbon Benefit of Urban Golf Courses – measured biomass, understory volume, vegetation composition, tree height and density, proportion of impervious surfaces, and key species counts (invertebrate, bird, and bat surveys). In doing so, researchers were able to determine overall biodiversity scores for three different park types: residential parks, residential gardens, and golf courses.

Eco-Schools | Ireland

Green Schools, known internationally as Eco-Schools, is an international environmental education program, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. In 2010, biodiversity was added as an integral theme to the Green Schools Program in Ireland, and since then, several projects related to increasing biodiversity in urban areas have been undertaken by students in the program. One such example is the Green Schools Woodland, where 3,560 native trees were planted as part of the International Year of Forests.

The Biodiversity in Urban Gardens Project | Sheffield University, England

Funded by Natural England, the Countryside Council for Wales, Environment and Heritage Service, Scotland and Northern Ireland Forum for Environmental Research and the Department for Environment, Food and Rural Affairs, this research project identified garden features and plant species that support wildlife-friendly gardens and increase urban biodiversity.

7. URBAN MEADOW

Wildflower meadows, like this one at the University of Reading, UK, encourage pollinating insects and other wildlife, and supports urban biodiversity.

Source: Urban Pollinators blog
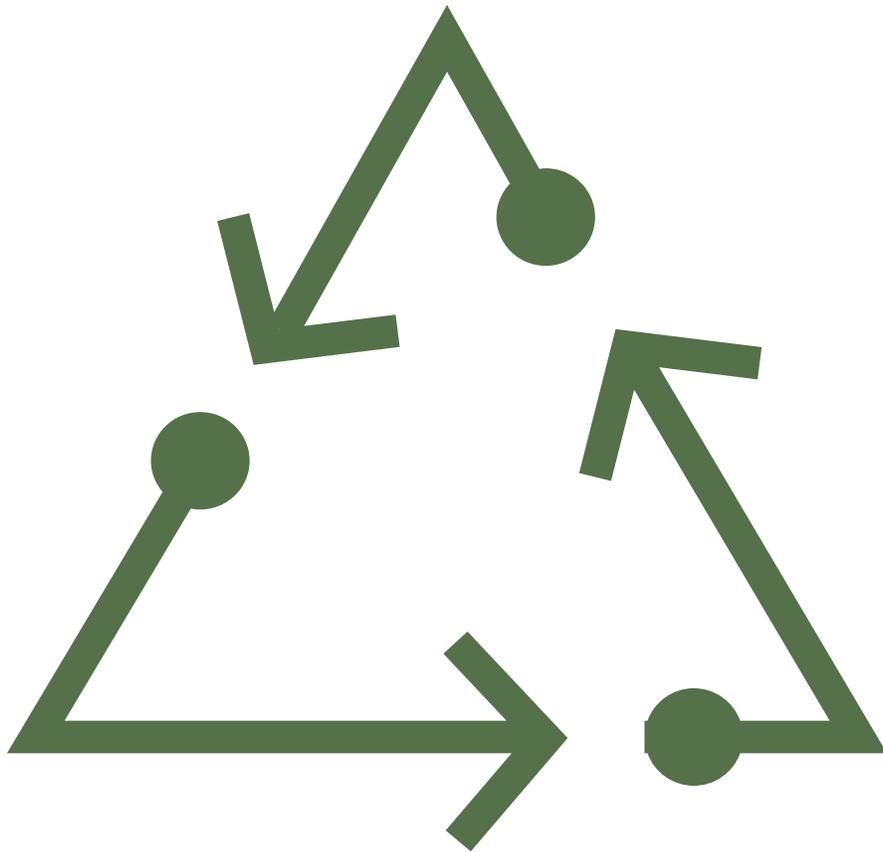
Waste Management

When considering the role of open space in waste management, most think of landfills. However, open spaces can be innovatively used to close the loop for waste management, providing spaces for active composting, temporary snow storage, and recycling / biofuel facilities.

Key External Stakeholders / Organizations

To implement plans and policies related to waste management, the City of Edmonton works with many key stakeholders and organizations to procure land for the storage of waste, or to manage waste in a sustainable manner.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can help to manage waste, particularly in making use of open space for composting, snow reuse, and land reclamation.

Alberta Environmental Network

Canadian Land Reclamation Association

EcoCity

Edmonton and Area Land Trust

Green Communities

Urban Development Institute

Relevant Plans & Policy

Often open spaces are viewed as net waste-producers, particularly spaces with intensive human use such as picnic sites, ball diamonds, and event spaces. However, open spaces can also act as waste-disposal sites, either directly (such as landfills or temporary snow disposal sites), or indirectly (such as urban gardens using compost). The use of urban-waste generated compost in urban gardening utilizes waste in the same location it is produced while simultaneously supporting a community activity with cultural and social significance that supports mental and physical well being. Redirected maintenance materials such as tree stumps, branches, and other organic debris can be used to block off unwanted trail access, or to protect areas intended for reforestation. Sites that are used as temporary snow storage locations in the winter may provide recreational opportunities in the summer. The waste itself may provide a benefit, such as using urban waste for biofuels and energy production, reducing our reliance on non-renewable energy sources. Using open spaces for waste management is possible by integrating open space use with waste management polices wherever these synergies are possible.

Federal Acts, Policies, and Guidelines

Waste management at the municipal level is not directly regulated by the federal government. Rather, the federal government provides objectives related to environmental quality and the movement of waste from one province to another, but these regulations provide the basis for provincial legislation related to urban waste management.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA), 1999

The Canadian Environmental Protection Act regulates and controls the release of toxic substances in the environment, including soil, air, and water contaminants. CEPA is relevant to the waste management function of open spaces in that it governs any waste that contains potentially toxic substances, such as industrial waste, and prevents their use for any purpose that will pose a risk for human health. However, reducing the risk to human health from hazardous waste is a best management practice for open space planning in general, and therefore the Green Network Strategy will be in alignment with the purpose of the Act by contributing to sustainable development through pollution prevention and by managing open space in a manner which protects the environment, and human health and wellness.

EAPA: EXPORT AND IMPORT OF HAZARDOUS WASTE AND HAZARDOUS RECYCLABLE MATERIAL REGULATIONS / INTERPROVINCIAL MOVEMENT OF HAZARDOUS WASTE REGULATIONS

The purpose of the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations is to ensure that hazardous waste and hazardous recyclable materials that are transported across provincial and international borders are managed appropriately to protect the environment and human health. By promoting the local use of urban waste through composting, landfills, and biofuel production uses, the City of Edmonton will reduce the environmental and human health risks associated with transporting waste materials to other locations.

Provincial Acts, Policies, and Guidelines

The Province provides regulations and standards for urban waste management to protect human health and the environment. Regulations which are relevant for open space planning include standards for composting storage and management, and waste control.

WASTE CONTROL REGULATIONS (1996)

Established under Alberta's Environmental Protection and Enhancement Act (EPEA), the Waste Control Regulations regulate the transport of waste materials within the province, and the licensing and approvals process for storage, treatment, and disposal facilities. Publicly accessible open spaces with unrestricted access should not be used for waste disposal, except for nonhazardous materials such as snow (on a temporary basis), or organic material in compost facilities. If public waste disposal sites such as landfills are decommissioned, they can be converted to recreational and other open space uses. See the Risk Mitigation brief for a discussion of this process.

STANDARDS FOR COMPOSTING FACILITIES IN ALBERTA

The Alberta Standards for Composting Facilities in Alberta and the associated Code of Practice for Compost Facilities outline the licensing and regulatory requirements for commercial and large-scale composting facilities (any facility which accepts 20,000 tonnes of feedstock per year). The purpose of these regulations is to ensure that Alberta's composting facilities are designed, constructed, operated and closed in a manner that protects air, land, water, biodiversity, human health, and human quality of life. These facilities would not be considered 'open spaces' under the principles and definitions of the Green Network Strategy. However, any open space plan that intends to use publicly accessible spaces for composting should account for potential human health and environmental concerns, such as odour issues or potentially contaminated soil if waste materials are not properly screened/sorted.

ALBERTA-BASED OFFSET CREDIT SYSTEM

Composting facilities may qualify for offset credits in Alberta's carbon offset credit system. Composting facilities that are diverting organic waste out of landfills can use the Alberta Quantification Protocol for Aerobic Composting Projects to determine avoided methane emissions from landfills. The opportunity for generating carbon offsets with this protocol arises from directly avoiding methane emissions from materials anaerobically decomposed in landfills by using compost for other purposes.

Relevant Projects & Programs Underway

The City of Edmonton manages urban waste through a variety of recycling, composting, repurposing, and waste processing programs. Not all of these programs are described in this Brief, but some which are more directly applicable to the waste management function of open spaces include the following.

ORGANICS PROCESSING PROGRAM

Edmonton's organics processing program uses the organic portion of the waste collected in combination with biosolids (treated sewage sludge) to create compost. The key operations for processing organic waste currently take place at the Edmonton Composting Facility, which produces compost from 160,000 tonnes of organic waste and biosolids per year, producing quality compost for use in agriculture and horticulture. This processing program provides an excellent potential source of compost for use in open space landscaping or urban gardening.

COMPOST S'COOL AT THE BACKYARD COMPOST EDUCATION CENTRE

Between Victoria Day and mid-August, staff and volunteers are available every weekend at the John Janzen Nature Centre to answer questions about composting on a drop-in basis. They also run a number of registered workshops, corporate lunch n' learns, and classroom-based presentations. Participants can try various bins, tools and methods, and learn which works best for their composting needs.

WASTE MANAGEMENT CENTRE AND RECYCLING DEPOTS

The City of Edmonton has an excellent waste recycling program to divert household waste from landfills. Open space design concepts such as visual buffers or 'greenscaping' may improve the aesthetics of recycling depots, which can be unsightly if not maintained regularly. By diverting waste from landfills, recycling programs reduce the demand for waste storage sites, which frees up marginal lands for reclamation to other uses (see the Risk Management Brief for more information on this process).

FREE MULCH PROGRAM

One of the means by which the City of Edmonton disposes of wood waste from its open space maintenance operations is by recycling it into mulch. The mulch (assuming it is disease-free) is provided for free to the public through the Ambleside Eco-Station and the Old Man Creek Tree Nursery.

COMPOST DEMONSTRATION SITES

Waste Management Services maintains compost demonstration sites throughout Edmonton, including the Muttart Conservatory, City Hall, the John Janzen Nature Centre, and many community gardens. Visitors to these sites observe a variety of composting methods and can learn to compost in their own backyards.

Relevant Funding Streams & Mechanisms

Sustainable urban waste management includes programs that redirect waste streams from landfills, and that address contamination from stored waste. Federal and provincial funding programs that provide resources for waste management infrastructure projects include the following.

Federal Funding Sources

» **Federation of Canadian Municipalities (FCM) Green Municipal Fund (GMF)** provides loans and grants for sustainable neighbourhood action plans, community brownfield action plans, feasibility studies, or capital projects related to retrofitting, construction, replacement, expansion, soil remediation, or brownfield, energy, waste, water, or transportation infrastructure.

» **Canada's Economic Action Plan - Green Infrastructure Fund** supports sustainable energy generation and transmission, and municipal wastewater and solid waste management infrastructure.

Provincial Funding Sources

» **Climate Change and Emissions Management (CCEMC) Corporation** was created in 2009 as another tool to support Alberta's Climate Change Strategy. A not-for profit organization, the CCEMC supports projects that help Alberta to reduce greenhouse gas emissions and adapt to climate change. Funding can be applied to waste management streams that reduce emissions, such as the City of Edmonton Organic Waste Processing Facility.

Best Practices & Trends

Temporary Snow Storage

Although the City of Edmonton once disposed of snow in the North Saskatchewan River, for the past several decades snow has been stored and disposed in facilities specifically engineered to control the runoff of sediments and contaminants into the environment. Nevertheless, public open spaces are still used for the temporary storage of snow before it can be removed to storage facilities. Additionally, open space buffers can be used to screen snow storage facilities and mitigate any nuisances (e.g. noise, visual impact) from their operations.

Urban Composting and Compost-Use

Traditionally, urban settlements are importers of natural resources and exporters of pollution and waste. Waste management in urban areas is a pressing issue, as landfills reach their capacity and land for expanding them becomes more expensive and harder to obtain. In addition to recycling waste streams, composting for organic waste is becoming increasingly popular as a method of managing urban waste. However, what is not always recognized is the opportunity to realize the synergistic benefits of using compost for urban gardening projects, both at the community garden level, and for green space landscaping and maintenance. Producing food in or close to urban settlements allows the utilization of wastes as inputs to the process, thereby recycling the nutrients that would be otherwise discharged to the environment in landfills or surface water. By making city compost available to residents for urban gardening use, this creates both an incentive to garden in the urban setting (increasing urban green space and providing a social benefit simultaneously), and reinvests soil nutrients locally.

This "locally-produced, locally disposed" ideology actually reduces the transportation costs associated with importing gardening compost from commercial compost producers. Managing access to urban compost in a way that is equitable is equally important. The quality of local soil can be a barrier to urban food production, particularly for residents with low incomes who perhaps cannot afford higher quality commercial soil. Integrating community gardening programs in low-income neighbourhoods with city-produced compost has the potential to achieve positive outcomes for both waste management and social equity, increasing human health and wellness and building a sense of community in marginalized areas.

Compost programs, even at the large scale, do not necessarily need to be highly technical or complicated. While there are relevant standards for ensuring compost is sanitized to remove pathogens and pests before use in food production or gardening, generally this involves the application of heat to achieve adequately high temperatures to kill pests and aeration to ensure complete aerobic biological digestion. Generally speaking, relatively low-tech local-scale composting facilities can achieve this with minimal capital investment. However, perhaps more important than capital investment in composting technology is the level of handling and sorting of waste material before composting. The mishandling or inadequate sorting of compost material can lead to contamination of the compost material with heavy metals or deleterious substances.

1.

1. COMPOST SYSTEM

Composting systems can range from industrial-scale facilities to simple bins, like this one at the community garden of the David Family YMCA in Knocville, TN, which involve manual sorting and mixing.

Source: Knoxville YMCA

Precedents

The City of Edmonton has several excellent programs to address urban waste management issues. Comparing these programs to other municipalities in Canada, it is obvious that Edmonton is among the country's leaders in reducing the environmental impact of its waste.

Snow Storage and Disposal Facility | Toronto, ON

In December 2010, the City of Toronto opened a new snow disposal facility, increasing its storage capacity by approximately 20%. The new facility was established on six hectares of disused industrial land which were partially converted to parkland as a noise and aesthetic buffer between snow storage areas (storage pads created from recycled asphalt) and the surrounding land uses. In total, 5,000 trees and plants were established on the site in addition to a runoff control system that stores meltwater and stormwater from the site in a 2-stage containment pond.

Red Wiggler Compost Program | Vancouver, BC

In 2013, the City of Vancouver started a program to make worm composting bins available for purchase at reduced cost ($25 for a bin compared to commercial costs that usually range from $80 to $150). The purpose of the program was to redirect organic waste, and to encourage urban gardening within the city.

Waste to Biofuels Chemicals Facility | Edmonton, AB

Perhaps one of the best examples of redirecting urban waste is Edmonton's Waste to Biofuels and Chemicals Facility, the first industrial scale biofuels facility of its kind being used to turn household garbage into biofuels and biochemicals. The City of Edmonton is currently diverting over 50% of residential waste from landfill through recycling and composting, but the new Waste to Biofuels Chemicals Facility will increase that diversion rate to 90%. The facility uses solid waste that cannot be recycled or composted.

2. COMPOSTING WITH WORMS

Using worms in composting accelerates the breakdown of organic materials and produces additional organic material that acts as "fertilizer".

Source: wormcompostinghq.com

2.

Risk Mitigation

Open spaces can be used to minimize environmental risks, for example, by stabilizing slopes, protecting floodways, and repurposing contaminated sites. Rehabilitating contaminated sites (i.e. brownfields, former landfills) restores or improves the function of open spaces.

Key External Stakeholders / Organizations

The City of Edmonton works with many key stakeholders and organizations to minimize risk to city residents by managing contaminated sites and human waste in a sustainable manner.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can help to mitigate and remediate hazardous areas, such as steep slopes, flood plains, contaminated sites, etc.

Alberta Environmental Network

Canadian Land Reclamation Association

EcoCity

Edmonton Natural Areas Advisory Committee

Federation of Canadian Municipalities

Green Communities

Urban Development Institute

Relevant Plans & Policy

Public lands that are considered unsuitable for development due to contamination issues or other environmental considerations may actually provide excellent opportunities for creating urban open spaces. For example, decommissioning landfills or reclaimed brownfield sites may not be suitable for housing developments, but may be safe and suitable for urban parks, recreational spaces, or nature preserves. In turn, open spaces can also be used to mitigate environmental risk through appropriate land use. River floodways, for example, are typically restricted for development purposes but are highly valuable from an ecological perspective, making them suitable as natural parks. Even highly contaminated sites can be converted to naturalized wildlife areas to support urban biodiversity, and open spaces can be used as a buffer between contaminated sites and high-traffic areas, for example by establishing a green space perimeter around snow dumps, landfills, and hazardous waste sites.

In addition, green infrastructure can be used in open spaces to mitigate potential flooding from stormwater.

The protection of natural areas along the North Saskatchewan River Valley and Ravine System is detailed in the Biodiversity Brief. The use of green infrastructure to manage stormwater and prevent flooding is covered in the Water Management Brief. Therefore this brief will focus on the potential for reclaimed land to be used for open space, and development guidelines in floodways.

Each summary provided below seeks to answer two key questions: "What is the purpose and scope of this policy/plan?" and "How is it relevant to the risk mitigation function of open spaces at the strategic planning level?"

Federal Acts, Policies, and Guidelines

The management of contaminated sites falls under the federal regulatory requirements for soil, air, and water quality, such as the Canadian Environmental Protection Act (CEPA) and the Federal Environmental Quality Guidelines. However, regulations related to the standards for reclaimed land typically fall under provincial legislation, rather than federal (see Provincial Acts, Policies, and Guidelines). Federal programs do exist for flood risk mitigation, such as the Federal Flood Reduction Program.

FEDERAL FLOOD REDUCTION PROGRAM

Over a period of about 25 years, the federal government has engaged communities and provincial governments in a series of flood risk mapping exercises to identify flood risk areas for the purpose of flood damage reduction. The aim of the Flood Damage Reduction Program is to discourage future flood-vulnerable development. Flood area mapping is carried out in partnership with provincial governments via cost sharing agreements. Flood risk mapping has been completed for many communities in Alberta in partnership with the Alberta government. Flood hazard maps are available for the City of Edmonton and surrounding area, which includes the North Saskatchewan River, Sturgeon River, and Blackmud Creek.

Provincial Acts, Policies, and Guidelines

Flood mitigation and the management of contaminated sites are within the jurisdiction of the provincial government of Alberta. For example, reclamation requirements for brownfield sites and landfills are covered by provincial legislation related to environmental protection, while flood mitigation policies and programs are currently in development by the Government in response to recent flooding southern Alberta.

FLOOD MITIGATION IN ALBERTA

The government of Alberta has developed a number of programs to address flooding risk in Alberta communities. In addition to providing funding and technical support for flood mitigation infrastructure (dams, berms, dikes, engineered floodways, etc.), the government has developed tools for assessing flood risk (Municipal Recovery Toolkit) and programs for the development of long-term resilience to flood and drought (Alberta Community Resilience Program). The government has also developed legislation to limit development in floodways (Bill 27), and has offered a voluntary buyout of 254 homes in flood-prone areas of the province.

» **Bill 27, Floodway Development Regulation (2013)**: The Flood Recovery and Reconstruction Act was enacted in December 2013, and amends the Municipal Government Act (MGA) to control, regulate, or prohibit any land use or development in a floodway. Under the Act, municipalities are not allowed to approve new developments in floodways (with a provision to exempt floodway development in municipalities with significant development already in place). In addition, residents already living in flood fringe areas must take measures to flood-proof their homes, and future development is restricted in flood fringe areas.

The Green Network Strategy must recognize that any planned developments within floodways will be restricted under this provision. While this represents a barrier to development, it also provides an opportunity to designate floodways as natural parks and protected areas where most recreation activities can still be enjoyed.

» **Alberta Community Resilience Program:** The Alberta Community Resilience Program (ACRP) supports municipalities in the development of long-term resilience to flood and drought events and supports integrated planning for healthy, functioning watersheds. The program provides provincial funding through grants for flood and drought mitigation infrastructure, such as dams, outfall improvements, flood barriers, engineered ponds and wetlands, culvert repairs, etc. At the strategic level, this program is a significant potential funding source for plans that address flood risk. In addition, flood risk planning can be integrated with land use planning to provide opportunities to increase the value of open spaces beyond risk mitigation (for example, by using flood berms as a river lookout point).

» **Municipal Recovery Toolkit**: The Municipal Recovery Toolkit was developed in response to the recognized need for Municipal Flooding Recovery Plans following the many costly flooding events in 2013. The toolkit outlines a planning framework for intermediate and long-term recovery planning, and guidelines for plan development.

An important part of flood recovery planning is regulating appropriate land use in floodways to reduce the potential for costly infrastructure and property damage during flood events. Using floodways as green space, particularly in areas where provincial regulations prohibit development, not only reduces the direct human risk from flooding, but also protects against potential future costs.

LAND RECLAMATION IN ALBERTA

Alberta protects and manages contaminated land through the Environmental Protection and Enhancement Act (EPEA), which ensures that land used for industrial activity is reclaimed in an environmentally sound manner. The reclamation of industrial contaminated sites (brownfields) and landfills are therefore subject to these regulations, depending on the former land use. Reclaimed land from oil and gas developments, for example, are regulated under the Upstream Oil and Gas Reclamation and Remediation Program, sand and gravel operations are regulated under the Code of Practice for Pits, and landfills are regulated under the Code of Practice for Landfills. In most cases, the regulations for industrial activities such as landfills and natural resource extraction activities will require that project proponents set aside funding for post-project reclamation at the time of decommissioning, although this funding may not be adequate to redevelop the site for specific purposes (such as redevelopment to a park space). These regulations should be consulted when assessing the appropriate use for reclaimed sites.

1. WESTMINSTER PIER PARK

This park in New Westminster, BC is located on a former industrial brownfield. The project won a Federation of Canadian Municipalities (FCM) Sustainable Communities Award in 2012.

Source: Dennis S. Hurd via Flickr.com

City of Edmonton Plans, Policies, and By-Laws

FLOOD PREVENTION

While the City of Edmonton does not have standalone floodway or flood risk policies, the City does manage flooding risk from stormwater through its stormwater management plans and policies (see the Water Management Brief). In addition, restricted development through appropriate zoning in floodways along the North Saskatchewan River and Ravine System are also considered in the City's Municipal Development Plan, and the River Valley conservation plans. For example, the City already has development guidelines in place for the North Saskatchewan River Valley and Ravine System, which includes flood-prone areas. The guidelines are included in the Ribbon of Green Concept Plan and Master Plan, North Saskatchewan River Valley and Ravine System ARP, and the River Valley Alliance Plan of Action documents detailed in the Biodiversity Brief.

These development guidelines complement the Alberta Floodway Development Regulations by ensuring that development is restricted within the river valley area. The use of the River Valley and Ravine System as publicly accessible open space is also supported by these planning documents.

LAND RECLAMATION

In The Way We Green, contaminated lands and brownfields are identified as having potential adverse impacts on the urban ecosystem, representing a significant risk to the city's sustainability. While brownfield reclamation is more resource-intensive that greenfield development, it can rejuvenate communities and result in more compact land use. The goals outlined in The Way We Green include finding new ways to increase biodiversity throughout the city, to plant more trees to benefit ecosystems and mitigate the urban heat island effect, and to establish new programs to manage and mitigate brownfields and contaminated sites. These goals can be accomplished through purposeful strategic planning. The City of Edmonton addresses brownfield reclamation through its Brownfield Redevelopment Strategy which identifies, inventories, and provides reclamation grants for brownfield sites within city limits.

The City-Wide Natural Area Management Plan (see the Biodiversity Brief) acknowledges that human disruption of natural fire patterns in wooded areas is one of the challenges of natural area management in Edmonton. One of the Plan's vegetation management strategies is brush clearing, which specifies limited clearing of underbrush and fallen dead vegetation in order to provide wildlife habitat and substrate for new growth, and promote nutrient cycling. However, the plan also acknowledges that clearing may be necessary where fuel loading poses a fire risk to public safety or property.

Relevant Projects & Programs Underway

The City of Edmonton mitigates risk primarily through the everyday operations of its various departments and branches, which are responsible for adequately clearing parks of flammable brush, implementing land use policies to prevent development in floodways, and coordinating with senior levels of government to reclaim contaminated sites. Many of these activities do not belong to any discrete project or program. Nevertheless, the City is currently undertaking a major initiative to mitigate flooding, with public open spaces anticipated to play a major role. The innovative Brownfield Redevelopment Grant Program is addressed in the next section.

CITY-WIDE FLOOD MITIGATION STUDY

This ongoing program is designed to assess and mitigate surface drainage flooding in portions of the city at risk of flooding during major rainstorms, including 123 residential neighbourhoods and 26 industrial parks. These areas lack contemporary stormwater management infrastructure, such as dry ponds or overland drainage systems. Implementation of the program, expected to start in 2019, will cost $25 to $50 million in capital investments, and will take 50 to 100 years to complete. The drainage assessments could have a significant impact on open space planning at the city-wide level (and vice versa), since many elements of the necessary infrastructure are anticipated to use open fields on school yards and community recreational parks.

Relevant Funding Streams & Mechanisms

Remediating contaminated sites and repurposing them for public use can be expensive. Federal and provincial programs can help to offset these costs.

Federal Funding Sources

» **Federal Contaminated Sites Action Plan (FCSAP)** is a $3.5 billion program to reduce environmental and human health risks from known federal contaminated sites.

» **Federation of Canadian Municipalities (FCM) Green Municipal Fund (GMF)** provides government loans and grants for sustainable neighbourhood action plans, community brownfield action plans, feasibility studies, or capital projects related to retrofitting, construction, replacement, expansion, soil remediation, or brownfield, energy, waste, water, or transportation infrastructure.

Provincial Funding Sources

» **Alberta Community Resilience Program** provides provincial grants to municipalities for flood and drought mitigation infrastructure, such as dams, outfall improvements, flood barriers, engineered ponds and wetlands, culvert repairs, etc.

» **Provincially-mandated funding** for site reclamation during project approval is specific to the type of land use being applied for (pipelines, mining facilities, petrochemical plants, gas stations, landfills, etc.) in terms of the amount of funding required, and how that funding is secured and used by the province. However, often the province will work with municipalities to develop post-reclamation land use plans and may provide additional provincial funding to deal with site contamination.

City of Edmonton Funding

» **Flood Prevention Program** provides rebates and installation financing for green infrastructure.

» **Brownfield Redevelopment Grant Program** provides grants to assess, test, delineate, and remediate brownfield refueling sites on properties within city boundaries.

Best Practices & Trends

Development in Floodways

While the benefit of restricting development in floodways may seem straightforward, implementing floodway policy and zoning can have social implications which are difficult to navigate. The boundaries of floodplains have not always been well understood, and even with good information and reliable modeling, floodplain boundaries change depending on the event frequency being used (100-year flooding events being the standard). In the absence of proactive development policy and clear floodway delineation, urban development along river valleys and ravines has historically proceeded unimpeded, or pushed the boundaries of any existing zoning. As a result, the grandfathering of existing development into floodway protection zoning is more contentious and risky in terms of getting policy support than establishing zoning restrictions on a go-forward basis in areas without intensive development.

Despite the challenges there are many case studies that demonstrate the value of establishing floodway zoning, even as recently as the 2013 flooding events across southern Alberta which resulted in an estimated $5 billion in insurable damages. If development is not appropriate in river valleys and floodplains, then there is an opportunity to protect these areas and designate them to land uses with lower capital investment, recognizing that asset investment in river valleys represents a cost risk due to flooding potential. Low-capital land use such as nature preserves and protected natural areas with informal trail systems may be an appropriate management strategy for open spaces in flood zones. These uses support urban biodiversity, provide safe movement corridors for wildlife, and can be used for important recreational opportunities such as walking, cycling, or camping.

2. LIMITING FLOODWAY DEVELOPMENT

The North Saskatchewan River overflowed its banks in Edmonton in July 2013, but because development is restricted in the river valley, the city did not suffer as much damage as other cities, such as Calgary or High River.

Source: bulliver via forum.skyscraperpage.com
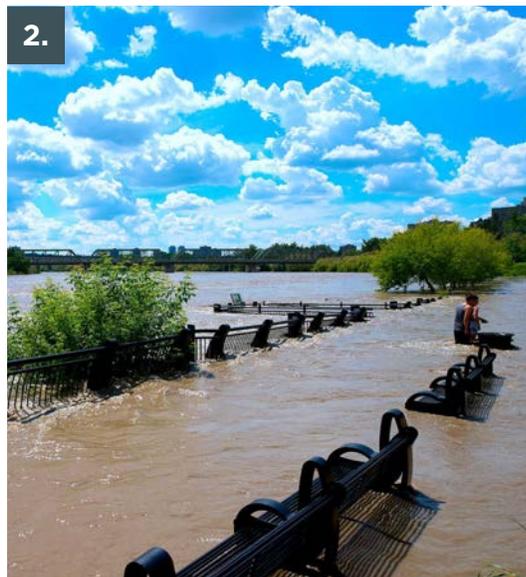
3. CORKTOWN COMMON

In order to enable waterfront redevelopment in Toronto, the Waterfront Toronto authority was required to construct earthworks and open space buffer - now a public park - to mitigate flooding from the adjacent Don River.

Source: ReNew Canada
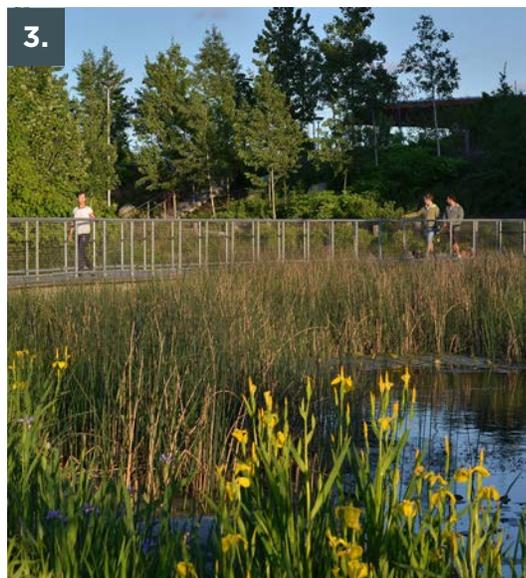
Using Reclaimed Land for Public Open Space

As the human health, environmental, and economic benefits of open spaces are recognized, there has been a resulting push to ensure that the expansion of towns and cities accommodates the need for open spaces at the community and city-wide level. While this is a matter of development policy and planning in new neighbourhoods and industrial areas, in mature parts of the city ensuring equitable open spaces can be more challenging than new neighbourhoods due to the limited available land base. Reclaiming and repurposing marginal brownfield lands such as demolition sites, condemned houses, decommissioned landfills and contaminated sites is one option for increasing open spaces in areas where greenfield land is not available, or too expensive to purchase. The added benefit is that the municipality simultaneously addresses the human health and environmental risks associated with the site.

The conversion of brownfields into open spaces comes with its own set of costs and risks, and is not always inherently sustainable. This is particularly true if there is a mismatch between the objectives of reclamation and the planned long term site use, or if there isn't adequate community support. Both of these risks can be minimized with careful planning and by engaging relevant community groups early in the project planning phase. In addition, successful restoration requires a thorough understanding of site assets and liabilities and how they support or limit post-reclamation site use. A risk-based cost-benefit analysis will support the decision making process, particularly for projects where both the environmental assessment and site remediation process will be long and costly. Additionally, it is important not to undervalue the social and environmental benefits which may be intrinsic and are not always easily measured. At the strategic level there should be the recognition that brownfield sites have the potential to meet open space needs, and that the value of reclamation goes beyond the final site use: it also includes the benefit of reducing risks associated with the site and improving the value of the community from an aesthetic point of view.

Precedents

Landfill Restoration to Open Spaces

» **Tifft, Buffalo:** This nature preserve is located three miles from downtown Buffalo, and is built on top of a former landfill. The park contains 264 acres of wildlife sanctuary for birds, deer and fish, and includes extensive functional marshlands. Hiking, bird watching, photography, and fishing are among the park's recreational opportunities.

» **Mount Trashmore, Virginia:** Mount Trashmore is a former landfill built on top of compacted waste. The site includes basketball courts, a skate park, and picnic areas.

» **Millennium Park, Massachusetts:** This 100-acre park created on a former landfill is home to six miles of trails through parkland with some of the best views of downtown Boston.

4. MILLENNIUM PARK, MASS.

View from the top of the former landfill towards Boston.

Source: mapio.net
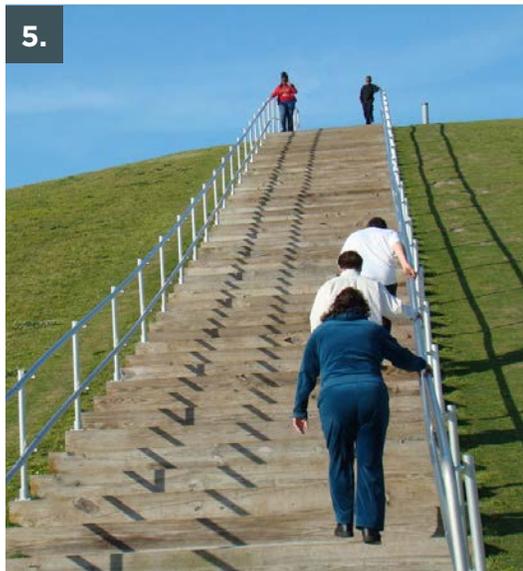
5. STAIRS AT MT. TRASHMORE

This former landfill, now a popular recreation park, was opened in 1974 in Virginia Beach.

Source: urbanparkland. blogspot.com

6. HIRIYA PARK

East of Tel Aviv, Israel, the Hiriya Park (part of the Ariel Sharon Park) was designed by landscape architect Peter Latz, and will be covered with a layer of "bioplastic" to prevent methane escape.

Source: Duby Tal via landezine.com

» **Chambers Gully, Australia:** Chambers Gully is a reclaimed former landfill which was converted to a naturalized eucalyptus forest almost completely by volunteers.

» **Hiriya, Israel:** Hiriya is one of the largest landfills in the Middle East, and is currently undergoing renaturalization into an urban park. When complete in 2020, it will be one of the largest urban parks in the world.

» **Greenhead Moss Community Nature Park, Wishaw, Scotland.** Greenhead Moss Community Nature Park was a community-managed project to transform a former landfill into a local nature reserve. The project included 13 hectares of restored native woodland, restoration of a remnant raised bog, restoration and protection of several important wetlands, a reed-bed filtration system to treat landfill leachate, and ongoing site management planning for biodiversity, access, and education.

Brownfield/Contaminated Sites Restoration to Open Spaces

» **Anfield Wildflower Garden, Liverpool:** Landlife is a registered environmental charity working in urban and urban fringe areas in Liverpool. They worked with the City to reclaim a demolition site adjacent to Anfield Football Field. A multi-year project to restore the area using mostly native annual plants has been largely successful, and the planting scheme has been very popular with the local community due to the aesthetic value the riotous flowers bring to the formerly derelict area.

» **Lee Quarry, England.** This project converted a decommissioned quarry into a historic park with extensive biking trails, creating a significant draw for local tourism. Community involvement in this project ensured local buy-in, and the nearby residents are adopting ownership of the site and helping to maintain and manage it.

» **Beardmore Park, Glasgow.** The Beardmore Park site was a derelict, 1-hectare former industrial lot that was rated as one of the worst eyesores in Glasgow by City Council in 2001. Since then, the area has been transformed into a multifunctional park with event spaces, garden spaces, and play areas for all ages.

» **Gas Works Park, Seattle, Washington.** Gas Works Park was built on the location of a former coal gasification plant in 1965. Former plant buildings have been converted into picnic shelters and an open-air play barn for children. The project has been celebrated for its ability to garner local support and shift public perceptions of post-industrial landscapes.

» **Duisburg Nord Landscape Park, Germany.** This park was established on a 570-acre site of a former steel plant. The transformed site uses existing structures combined with new amenities to promote recreation and community, such as a diving pool, rock climbing wall, picnic areas, hiking trails, and performance spaces.

» **Alumnae Valley, Wellesley College, Wellesley MA.** This project reclaimed a formerly toxic brownfield site (power plant, parking lot, and a natural gas pumping station) in Alumnae Valley. Rehabilitating the contaminated soil was done in several steps, involving direct removal, on-site remediation, and contaminated soil repurposing.

7. ALUMNAE VALLEY

In this remediation at Wellesley College, MA, earth mounds were constructed not only to mimic the original, glacier-formed landscape, but also to store remediated soil.

Source: Michael Van Valkenburgh Associated Inc.
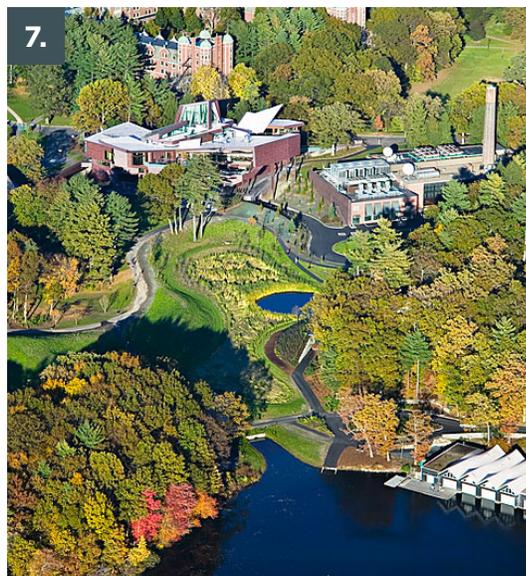
Food Production

Open spaces provide opportunities for food production, which in turn provides the city with food security, healthier communities, community interaction, food/local agriculture connection, and skill development.

Key External Stakeholders / Organizations

There are many stakeholders and organizations that the City of Edmonton works with to promote and support urban food production. Some of these organizations provide funding or land for community gardening initiatives, while others directly promote or manage urban food projects or programs.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that might have a vested interest in how Edmonton's Green Network can provide community gardens and integrate with the local agriculture community to help increase the presence and capacity for "local food" in the city.

Alberta Environmental Network

EcoCity

Edmonton Federation of Community Leagues

Edmonton Horticultural Society

Environmental and Outdoor Education Council

Evergreen

Greater Edmonton Alliance

Green Communities

Northlands

North Alberta Institute of Technology (NAIT)

Sustainable Food Edmonton

University of Alberta - environmental and outdoor education specialists

Relevant Plans & Policy

While food production in North America has traditionally been a concern of rural areas, urban food production through local community and backyard gardening efforts is increasing in popularity as food prices increase and agricultural land prices escalate. On the other hand, commercial urban agriculture, which is larger in scale than backyard or community gardening but still within the urban setting, has been around as long as cities themselves, since most communities began as agrarian settlements. Unfortunately, urban farmers are met with significant challenges due to development pressures around city margins, increasing land values, and municipal regulations that restrict farming activities in urban areas, making it difficult to compete with larger-scale producers. This is problematic because urban food production has many potential social, ecological, and economic benefits, such as increasing the percentage of vegetated open space, creating a sense of place and community building, providing food security for lower income citizens, supplying educational opportunities, promoting physical exercise and activity, and generating income. Locally grown food decreases transportation costs (and associated emissions), and when successful, can improve human health by providing fresh, nutritious food to the local community. There may be opportunities to support local food production, at the garden or agricultural scale, through strategic planning and policy development.

Urban food production that occurs on the backyard or community garden scale is usually regulated by the municipality, and may be subject to certain rules or guidelines established by the community league or organization managing the garden. Nevertheless, if the Green Network Strategy recommends support for urban food production efforts (for example, by leasing City-owned land for agriculture purposes or by partnering with private agriculture producers to create community gardens and horticultural centres), it may be important to understand the federal and provincial regulatory framework for urban agriculture.

Federal Acts, Policies, and Guidelines

AGRICULTURE AND AGRI-FOOD CANADA (AAFC)

Commercial urban food production that is 'agricultural' in scale falls under the jurisdiction of federal Acts and regulations administered by Agriculture and Agri-food Canada. These Acts and regulations are too numerous to summarize for the purpose of this Brief, but they include Acts related to federal agricultural programs (Canada Agricultural Products Act, Agricultural Marketing Programs Act, Canadian Agricultural Loans Act, Experimental Farm Stations Act, Farm Income Protection Act, etc.) and regulations which govern the agricultural activities themselves (Alberta Chicken Order, Barley Stabilization Regulations, etc). Some of these regulations apply to farm activities in general, while others are specific to the product or province. Agricultural activities are also subject to environmental regulations regarding air, water, or soil quality such as the Canada Water Act and Canadian Environmental Protection Act, or to provincial environmental regulations (Alberta Water Act, Alberta Wetland Policy, Alberta Environmental Protection and Enhancement Act, etc.). These acts are summarized in other Briefs (Water Management, Climate Regulation, and Biodiversity).

Provincial Acts, Policies, and Guidelines

ALBERTA AGRICULTURE AND FORESTRY

At the commercial scale, urban agriculture is also regulated by the Government of Alberta, Agriculture and Forestry divisions. Similar to federal regulations related to agriculture, the provincial regulations which apply to agriculture in the province are too numerous to summarize for this Brief. However, it is important to recognize that many aspects of agricultural production are subject to provincial regulations. For example, the Agricultural Operation Practices Acts and Regulations regulates production activities and agricultural operations. Water use for agricultural purposes is governed by the Irrigation Districts Acts and Regulations. Soil quality is managed through the Soil Conservation Act and Regulations. Pests such as weeds and invasives are controlled through the Agricultural Pests Act and Regulations, and the Weed Control Act and Regulations. Other Acts and regulations apply to the product itself, such as the Animal Health Act and Regulations, Animal Keepers Act, Dairy Industry Act and Regulation, Livestock and Livestock Products Act and Regulations, Crop Payments Act, Bee Act and Regulation, and many others.

1. FARMERS' MARKETS

Farmers' markets, like this one in Edmonton, leverage open space to promote community interaction while providing healthful, fresh foods grown locally.

Source: City of Edmonton

City of Edmonton Plans, Policies, and By-Laws

Urban food production can be impacted by many municipal policies and regulations which, at first glance, do not appear to directly relate to the activity itself. For example, landscaping policies may restrict the types of plants that can be grown in open spaces, or the materials that can be used in front yards. Some bylaws may need to be evaluated regarding how they currently support or restrict urban food production, for example, by restricting food production at the commercial scale, or by prohibiting gardens in front yards or in communal spaces. Some of the City of Edmonton plans, policies and by-laws that affect urban food production within city limits are identified below.

FRESH: EDMONTON'S FOOD AND URBAN AGRICULTURE STRATEGY (2012)

The Strategy was established with the recognition that food and urban agriculture have the potential to improve the sustainability of the urban ecosystem, and improve quality of life. The Strategy identifies five goals related to urban food production in the city:

1. A stronger, more vibrant local economy.

2. A healthier, more food secure community.

3. Healthier ecosystems.

4. Less energy use, emissions, and waste.

5. More vibrant, attractive and unique places.

The strategy encompasses a variety of types of urban food production, including community and backyard gardens, vertical "balcony" gardening, and rooftop gardening, and provides strategic direction to support these activities. Following public and internal consultation, Fresh put forth several recommendations that are directly applicable to open space planning:

» Work with the EFC and various partners to provide learning opportunities on key food and urban agriculture topics and initiatives;

» Assess and map Edmonton's food system assets;

» Pursue urban agriculture opportunities in existing and developing neighbourhoods;

» Develop partnerships to support innovation in urban agriculture;

» Assist in creating appropriate spaces and opportunities for local food businesses to operate and expand;

» Assist in improving neighbourhood-scale food infrastructure;

» Create partnerships to strengthen and diversify the local food economy;

» Strengthen farmers' markets (including the development of new market sites);

» Pursue partnerships with non-profits and other agencies such as Community Food Centres Canada to establish a public sector Edmonton Community Food Hub;

» Celebrate and promote local food producers, community gardens, and food grown, raised and made in Edmonton;

» Examine establishing a municipal Agricultural Land Reserve (ALR) designation;

» Adopt and apply the "Integrating Land for Agriculture Framework"; and

» Work with the Capital Region Board to develop a regional agricultural land use policy.

Many of these recommendations may align with the goals of the Green Network Strategy, and should be considered in the open space planning process and Green Network Strategy Implementation Plan.

LANDSCAPING REGULATIONS

The Edmonton Zoning Bylaw requires that residential property owners landscape any front or side yards that are visible from a public street. Only certain materials may be used, including grass seed or sod; washed gravel or shale; flower beds or cultivated gardens; trees, shrubs or other plants; outdoor furniture or sculptures; fences or walls; and decorative bricks, pavers or stones.

As written, the landscaping regulations appear not to restrict the use of front and side yards for urban food production as long as the definition of "cultivated gardens" includes food-production types of plants and is not restricted to ornamental plants.

ZONING BY-LAW (2016 AMENDMENTS)

The City of Edmonton supports urban gardening through its zoning bylaws by establishing land use classes that are specific to urban agriculture, including Urban Outdoor Farms, Urban Indoor Farms, and Urban Gardens. Permits are not required for backyard gardens, and community gardens do not require a development permit if established on City Parkland unless they require amenities such as water lines or other infrastructure.

Relevant Projects & Programs Underway

There are many projects currently underway in the City of Edmonton that may help inform the Green Network Strategy by supporting the food production function of open space. These are current community and city gardening projects, or other horticultural projects and programs that support community gardening.

» **Muttart Conservatory grounds: Plant a Row – Grow a Row**

» **Edmonton's River Valley Food Forest**

» **Root for Trees**

» **Composting Workshops, John Janzen Backyard Compost Education Centre**

» **You're Gonna Love Green Program**

Relevant Funding Streams and Mechanisms

Community funding programs for urban food projects such as community gardens are available from non-government organizations and private enterprises.

City of Edmonton Funding

» **Sustainable Food Edmonton** provides information and educational programs for classrooms (Little Green Thumbs, Urban Ag High) and funding to establish community gardens in the City of Edmonton.

Other Funding Sources

» **Evergreen** provides funding for community-level greening projects such as urban gardens on school grounds.

» **Fiskars' Project Orange Thumb** was started in 2002. Community garden groups in the U.S. and Canada can apply for grants to help them reach their goals for neighbourhood beautification and creation of a healthy, sustainable food source.

» **Edible Trees** is a program of Tree Canada that provides funding for community-based projects that provide residents with access to fresh fruit and nut trees.

» **Communities in Action Fund** aims to support projects that promote community activity (sport and recreation), including gardening.

2.

2. EDMONTON RIVER VALLEY FOOD FOREST

The Food Forest is a project of the City of Edmonton to create a self-sufficient ecosystem with edible native plants in the North Saskatchewan River Valley, including saskatoon berry, chokecherry, currants, and raspberries.

Source: spacing.ca

Best Practices and Trends

Urban Farming

Urban farming is the practice of growing food in urban environments for wholesale and/or retail sale to urban consumers. Urban farmers include traditional agricultural producers who find their rural farms incorporated into the urban environment due to the expansion of cities through urban sprawl or annexation. It also includes farmers who use urban spaces such as backyards, vacant lots, rooftops, parks, and private or public spaces to grow food. These farms also include educational programs with a commercial component, such as culinary schools that fund their programs by selling the products from rooftop or community gardens. There are many important aspects to the urban food production system, including the land and space for agricultural activities, the actual growing of food which uses land and water resources, processing and distribution, and finally, food waste and recovery. The lifecycle of urban farming includes many opportunities to improve community sustainability. Local food sources reduce transportation costs and emissions; land used for agriculture contributes to urban green landcover; tidy gardens can improve park and open space aesthetics; processing, distribution and sales of urban farming contribute to the local economy and provide affordable fresh foods for residents; and food waste can be recycled into compost, which in turn can be used to grow more food.

Industrialization of the food production system and the North American trend towards large-scale corporate farming has put pressure on smaller-scale urban farms in cities where land value is much higher. This pressure has resulted in the emergence of community farming wherever publicly accessible land is available. These farmers do not necessarily come from a farming background, and are often early retirees or students without the financial resources to buy land. These smaller farms are usually hand-tilled and may or may not include watering systems, sheds, or other infrastructure. Where allowed by local bylaws, urban farms may include animals such as rabbits, goats, or hens. Usually this style of urban gardening produces small to medium yields sold predominantly in local markets.

Urban Gardening

Gardens have always been a part of the urban landscape. However, the idea of growing food in highly urbanized environments where land is scarce using vertical, terrace, and container gardening, or other non-traditional garden platforms such as green roofs or green walls, is a more recent trend. Urban residents are finding highly creative ways to grow food in environments where space is scarce in an effort to make food production local. Indoor gardening using hydroponics and indoor lighting systems is another growing trend, and the market for indoor growing platforms like hanging baskets, wall planters, and soil-free planters is growing as well.

3. FERME DE PARIS

Community gardening at Ferme de Paris, France.

Source: jardinons-ensemble-org

Precedents

There are many great examples of urban gardening projects around the world. The City of Edmonton, for example, has over 90 community gardens. The following are just a small sample of especially unique or inspiring urban gardening or urban agriculture projects:

» **Ferme de Paris, Paris.** A municipal organic farm nestled in an expansive park, Ferme de Paris provides the public with vegetable gardens, orchards, medicinal plant gardens and a number of farm animals housed in sustainably-constructed buildings.

» **Frisch vom Dach, Berlin.** An aquaponics project starting on the rooftop of a former malt factory in Berlin, Germany, Frisch vom Dach uses nutrients from aquaculture to irrigate plants in a mostly closed loop.

» **The Last Organic Outpost, Texas.** The Last Organic Outpost is a research farm that teaches sustainable agriculture techniques to residents of Houston, Texas. The project targets underserved areas and supports local farmers so they can develop a safe, healthy local food economy.

» **Pasona O2, Tokyo.** An urban farm in Tokyo that grows over 100 types of produce indoors, underground, and on the exterior walls of the nine-story office-style building, Pasona O2 has been described as technologically intensive.

» **ReVision Urban Farm, Boston.** ReVision Urban Farm is a community-based urban agriculture project that grows nutritious, culturally appropriate food for residents of its family home and the Boston community. The project also teaches locals about healthy eating and offers job training for youth and the homeless in the area.

» **TCRA Urban Agriculture Policy, Toronto.** The Toronto and Region Conservation Authority's urban agriculture policy includes 409 ha of agricultural land repurposed for urban agricultural purposes. TRCA has been an instrumental, leading partner in three community farm projects: the Toronto Urban Farm, the TRCA-FarmStart, and the McVean Incubator Farm Project.

4. MCVEAN START-UP FARM

McVean Farm, in Brampton, ON, includes community garden plots, a training program, and business development services. It is particularly intended to encourage farming among "near urban" new immigrant entrepreneurs.

Source: trca.on.ca

5. REVISION URBAN FARM

The ReVision Urban Farm is coordinated by Victory Programs, a Boston-based non-profit organization that provides health, housing and prevention services for people in need.

Source: Real Time Farms via greencitygrowers.com

CELEBRATION

The Green Network connects people to each other and builds a sense of place. These are places for communities to thrive, gather, and celebrate.

CELEBRATION

Aesthetic Value

Welcoming spaces with attractive design, natural scenery and public art are place-makers, helping Edmonton to attract and retain residents and visitors alike.

Key External Stakeholders / Organizations

The following external / public stakeholders represent a broad cross-section of interest and activism in Edmonton. Engagement in the consultation and implementation of the Green Network Plan could take advantage of their interest in the aesthetic value of open spaces where it intersects with beautification campaigns, nature appreciation, gardening, landscape management, public art, and a well-maintained, welcoming public realm.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that are involved in cultivating a quality built environment in Edmonton, and those that might have a vested interested in both the city's community design, as well as the aesthetics and appearance of the Green Network.

Alberta Agriculture

Alberta Culture and Tourism

Alberta Environment and Parks

Business Revitalization Zones (BRZs)

Canadian Forestry Service

Canadian Public Arts Funders

Communities in Bloom

Community groups / leagues

Corporate sponsors

EcoCity Edmonton

Edmonton Arts Council

Edmonton Bird Club

Edmonton Chamber of Commerce

Edmonton Federation of Community Leagues

Edmonton Horticultural Society

Edmonton Native Plant Group

Edmonton Nature Club

Edmonton Natural Areas Advisory Committee

Edmonton Naturalist Society

Evergreen

Federation of Alberta Naturalists

Landscape Alberta

Nature Alberta

Nature Conservancy of Canada

North Saskatchewan River Conservation Society

Parks Canada

River Valley Alliance

Society to Prevent Dutch Elm Disease

Relevant Plans and Policies

Most people would agree that aesthetic value – picturesque fields, impressive vistas, colourful landscaping or unique natural landmarks – is a key feature that makes open spaces attractive for spending time. Beauty and order combine to encourage appreciation and contemplation of place. Yet because aesthetic value is in the eye of the beholder, plans and policies (by their nature intended to be objective) rarely address this feature directly. Instead, they might promote or regulate elements that influence aesthetic value: landscape design and maintenance, protection of natural areas or view corridors, beautification strategies, and other indirect influencers of open space appearance. Planning for aesthetics also overlaps significantly with planning for other open space features, such that maintenance regimes which enhance visual appeal may also deter crime or improve ecological function, and inspiring landscapes targeted for preservation may also include heritage resources that attract tourism. Public art, while a significant aspect of the appearance and aesthetic value of open spaces, is also a form of cultural expression, and is addressed through the Heritage Brief.

This brief identifies the plans and policies most relevant to promoting, managing or regulating aesthetic appeal in open spaces in Edmonton, with particular attention to considerations for master planning.

Alberta Land Stewardship Act (ALSA)

The Alberta Land Stewardship Act provides for the registration of a conservation easement between a landowner and a qualified organization (for example, the City of Edmonton or a registered land trust) to protect or enhance lands with natural scenic or aesthetic value. This tool may be used to manage aesthetically-valuable privately-owned lands as part of the municipal open space system.

The Way We Live: Edmonton's People Plan

This Plan is summarized in greater detail elsewhere (see the Community Building Brief), but it also explicitly provides for an attractive city. The Plan specifies that the city ought to be well-designed, showcase civic pride through arts and events, promote the beauty of its green and open spaces, and work with residents to keep the city clean. A number of action items are provided in the Implementation Plan, including various park redevelopments, creation of a sculpture park, tree planting, and implementing other supportive plans and strategies (e.g. Winter City Strategy, Civic Precinct Master Plan, Capital City Downtown Plan).

For the Love of Winter: Edmonton's Winter City Strategy, Implementation Plan and Winter Design Guidelines

Collectively, these documents explain how aesthetic improvements to open spaces can help enliven Edmonton during its cold, snowy months. The Strategy recommends that snow be used for creative projects (snow forts, sculptures etc.) to enhance the beauty and interest of public spaces, and that the City coordinate with external partners to develop a winter beautification program. Notably, one of the primary goals of the Strategy is to incorporate urban design elements into public spaces that encourage activity, beauty and interest. The Guidelines specifically address the use of vegetation, colour, lighting, outdoor public art, and other design interventions to achieve "animated and delightful" open spaces.

The City of Edmonton Green Building Plan and Policy C567

These policies outline the City's mandate regarding the promotion of the Green Building Plan to encourage the transition to green buildings throughout the city. This might include pilot green building facilities in parks and other open spaces, or the provision of public spaces as part of green buildings themselves (e.g. rooftop community gardens). Green buildings can incorporate attractive and interesting design features to promote aesthetically appealing open spaces.

The North Saskatchewan River Area Redevelopment Plan (ARP)

The ARP addresses development and open space protection in the North Saskatchewan River Valley and Ravine System, including the valley floor, river banks, and top-of-bank or upland areas. The ARP emphasizes the benefit of a continuous linear park from an urban amenity perspective: one of its major goals is to provide for recreational, aesthetic and cultural opportunities. Specifically, the intent of Objective 2.3.7 is to "promote an exemplary standard of landscape, urban, and architectural design for all proposed development, park amenities and the general environment." Supporting policies recommend that urban design guidelines should be developed to inform public development, and that viewpoints should be established in areas with "outstanding views".

Closely related to the North Saskatchewan River ARP is the **City Policy C542: Development Setbacks from River Valley/ Ravine Crests.** The Policy acknowledges that, together with recreational opportunities and ecological functions, one of the primary values of the river valley and ravine system is the visual amenity it provides for residents. Accordingly, along with park access and development setbacks, the Policy considers measures to "enhance the visual appreciation and experience" of the valley and ravine system. Policy 1.10 mandates that vistas, views, and view corridors be identified starting at the Area Structure Plan stage of land use planning.

The supporting **City Procedure C542**, which also includes a Procedural Manual, specifies that a performance-based visual assessment must be performed for new Neighbourhood Structure Plans, Area Structure Plans and Outline Plans, and the redevelopment of larger sites adjacent to the top-of-bank. The resulting visual assessment report should include recommendations relating to visual connection and views/vistas and should address:

» Use of view corridors to enhance the overall image, identity, experience, and value of adjacent communities and the River Valley and Ravine System;

» The design of barrier-free top-of-bank roadway, pathways, and pedestrian linkages as important factors in the visual experience from Upland Areas;

» Integration and alignment of internal neighbourhood roadways to provide for view corridors;

» Location and orientation of public space within the neighbourhood or along the top-of-bank with a direct view corridor; and

» Opportunities to protect panoramic or scenic views from the Upland Area through land use and building height transition, development setbacks, landscaping/ fencing/berming, building stepbacks, and site planning.

Conservation of Natural Greenery

Closely related to the aesthetic value of open spaces is the health and extent of the urban tree canopy and natural areas. The presence of greenery and other vegetation provides diversity to a landscape, produces a sense of space, and brings colour and life to the city. According to a residential survey conducted by Banister Research and Consulting Inc. in 2009, Edmontonians identified beautification and nature appreciation among the top reasons for appreciating trees in their community. Some important City documents that guide the protection and enhancement of the living landscape are as follows.

» **City of Edmonton Urban Forest Management Plan** is intended to ensure a diverse and sustainable urban forest that improves the quality of life for Edmontonians. Its three umbrella objectives involve preserving and expanding the urban forest, educating the public and stakeholders around the urban forest and best management practices, and protecting native forests and tree stands. Each of the strategies and actions included in the Plan supports these objectives, with one of its intended outcomes to improve Edmonton's livability by ensuring that public green spaces are attractive and well maintained.

» **Edmonton Corporate Tree Management Policy C456A** is intended to holistically manage the public tree canopy, including ornamental and natural treed areas. The Policy establishes authority within the City for controlling the tree inventory through plantings, replacements, and proper maintenance, and for ensuring that City trees receive protection from destruction or damage. These objectives are achieved in a number of different ways, including regular operations of City Departments, requirements built into contract and

tender packages, and development requirements in several supporting City policies, including Tree Protection Hoarding Requirements and Guidelines for Working Near Trees.

» A number of City policies and plans are designed to preserve and expand natural areas, and maintain their integrity for ecological, wildlife, recreational and aesthetic values by minimizing (or mitigating) disruption or destruction:

  • Citywide Natural Area Management Plan (2010)

  • Parkland and River Valley Utility Installation Policy C307

  • Wildlife Passage Engineering Design Guidelines (2010)

  • Roadways and Parks Naturalization Master Plan

  • Ribbon of Green Concept Plan (1990) and Master Plan (1992)

Design and Construction Standards

Edmonton Design and Construction Standards, Volume 5: Landscaping (2015) ensures that landscape developments on City lands "provide well-constructed, functional, aesthetically pleasing, and sustainable public open space." The Standards provide guidance on numerous elements that can impact the aesthetic value of open spaces, including design, species selection, and maintenance of plant materials; the provision of features like fencing or site furniture; and landscaping requirements for a variety of spaces, such as parks, natural areas, or rights-of-way. Some policies that are specifically oriented to protecting or enhancing the aesthetic appeal of landscaped spaces include:

» Designing with a diversity of tree species suited to the Edmonton climate, such that localized aesthetic appeal is not reduced should one species suffer from pests or disease;

» Establishing shrub spacing that achieves a balance between aesthetic impact, shrub health and maintenance considerations; and

» Using landscaping features like boulders to provide interest to the landscape.

Water Features

Open spaces are also valued for the aesthetic quality of their water features, ranging from splash pads and reflecting pools to the North Saskatchewan River. Several policies influence the visual appeal of these features by promoting beautification, screening, or high-quality design of necessary water infrastructure, encouraging attractive landscaping elements such as bioswales or rain gardens, and ensuring that water quality is managed to avoid algae and other undesirable aesthetic effects.

» Alberta Environment Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (2013)

» Alberta Water Quality Guidelines for Recreation and Aesthetics (2014)

» Low Impact Development Best Management Practices Design Guide (2014)

Site Maintenance

Other City Bylaws and Policies have implications for the aesthetic value of open spaces with respect to physical integrity, maintenance, and location. Some of the more important bylaws include:

» **Community Standards Bylaw 14600** regulates certain activities on privately owned property and immediately adjacent areas. Although the Green Network Strategy cannot infringe on private property rights, the use of private property has the potential to impact the aesthetic amenity provided by public spaces, so planning efforts should consider coordination with adjacent landowners in the case of any conflicts. The Bylaw prohibits a landowner from permitting a "nuisance" on their property, i.e. allowing their land or buildings to show "signs of a serious disregard for general maintenance and upkeep." Examples might include excessive outdoor storage, refuse, unkempt grass, offensive odours, vegetation that obstructs sidewalks or visibility, graffiti or damage to structures, disruptive noise, or other activities that compromise the peaceful enjoyment of the surrounding environment.

» **Land Use Bylaw 12800** regulates the use and disposition of land in the City of Edmonton. These regulations influence aesthetic value not only by managing where parks and other open spaces are located within the city (and which land uses are located adjacent to them), but also by establishing regulations for signage, landscaping, building form, and urban design, all of which impact on the visual environment of the public realm.

» **Parkland Bylaw C2202** prohibits park users from engaging in activities that might damage or destroy facilities or sensitive natural areas. Vandalism reduces the functionality and impacts on the appearance of park open spaces, compromising aesthetic value.

» **Pest Management Policy C501** outlines the policies that City of Edmonton maintenance employees will use for pest management in public spaces, including parks and other open spaces. This includes the control of weeds, rodents and insects, which can compromise the visual appeal of a landscape, or the visual appeal of vegetation in the landscape. The policy emphasizes pest prevention and Integrated Pest Management, which can actually support the aesthetic value of parks by supporting plant health and strategically selecting plant species.

1. END OF THE WORLD

This informal viewpoint is being redesigned to address erosion and safety issues.

Source: Laura Osman via cbc.ca

2. COMMUNITIES IN BLOOM

This incredible display of flowers is one of the reasons Edmonton was nominated a National Finalist for the competition.

Source: Communities In Bloom

Relevant Projects & Programs Underway

The following City of Edmonton projects and programs incorporate an aesthetic component (enhanced vegetation, park maintenance, scenic features) that could help inform the Green Network Strategy.

» **Root for Trees** is an enhanced tree planting initiative which intends to increase tree planting through partnerships with corporations, individual residents and community groups, particularly using native plantings and naturalization.

» **Planting on Public Property** allows applicants to use City land for trees, shrubs, flowers and other vegetation for the purpose of neighbourhood beautification. Applicants are responsible for purchasing the planting materials, organizing volunteers for planting, and maintaining the planting.

» **Partners in Parks** engages community members and groups to assist with open space beautification, including planting of annuals, maintaining planting beds, and collecting litter. The Edmonton Horticultural Society is a project partner, and offers participants a membership to their organization.

» **Communities in Bloom** is a Canadian non-profit organization committed to fostering civic pride, environmental responsibility and beautification through a national program to enhance green spaces in communities. In 2015 Edmonton was a National Finalist for the Communities in Bloom Award. The City recognizes beautification efforts through its own Edmonton in Bloom Awards, and a directory that highlights projects contributing to the aesthetic value of Edmonton, including School Yard Greening, Community Gardens, and Capital City Clean Up.

» **Naturalization** has been implemented in a number of public open spaces, including:

- Hermitage Park
- Victoria Park Hill
- Government House Park
- Louise McKinney Park
- Whitemud Drive
- Gold Bar Park

» **The End of the World:** Currently in the design and environmental review/approval phase. The site is located at the top of the river bank on Saskatchewan Drive, at the end of the now-closed Keillor Road. The site offers excellent views of the river valley and west Edmonton, but requires improvements to address safety hazards caused by recession and slumping of the embankment and deterioration of a former retaining wall.

» **Dawson Park Master Plan:** Currently in the research and assessment phase. Identified issues that could have an impact on aesthetic value include maintenance issues and invasive species.

» **Buena Vista/Sir Wilfred Laurier Park Master Plan:** Currently in the process of implementation. Improvements include landscaping, upgrades to riverside pathways, creation of riverside viewpoints, weed removal and vegetation restoration, and general rehabilitation of some park facilities.

» **Queen Elizabeth Park Master Plan:** Currently in the process of implementation. Improvements include new lookouts on Saskatchewan Drive, and new or upgraded park amenities.

» **Westwood Park Ornamental Pond:** Scheduled to begin construction in 2016. Incorporates an ornamental fountain at the north end of the project area, which is intended to provide an idyllic setting for tranquil appreciation and community league events.

Relevant Funding Streams & Mechanisms

The following federal, municipal, and non-profit funding sources are not specifically designed to address the aesthetic value of public open spaces, but insofar as they can be directed toward a range of projects that improve the design, maintenance, vegetation, or programming within open spaces, they can affect the perceived aesthetic value of those spaces indirectly.

» **EcoAction Community Funding Program** is funded by Environment Canada to address environmental issues in communities.

Non-profit organizations are eligible (municipalities are not directly eligible). Applicable issues include clean air, clean water, climate change, habitat restoration and conservation.

» **City of Edmonton Community Investment Operating Grant** program provides operating assistance to Edmonton non-profit organizations whose activities benefit citizens of Edmonton with regards to social services, intercultural relations, or recreation/sport/leisure, including athletic, physical, historical, natural science, cultural, social and intellectual activities.

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhood play, wellness, and learning through active partnerships with the community.

» **Root for Trees Matching Grant** provides trees and shrubs on a value matching basis to communities who want to undertake planting in their neighbourhood. The project must address a specific need, provide a benefit to the community, and must be completed within 12 months. (Note this program is currently under review, and closed to new applicants.)

» **Edmonton Community Foundation Community Grants** provides funding for a wide range of projects and programs that meet a need in the community, strengthen organizational capacity, and promote collaboration and sharing among agencies to reduce duplication of programs or improve effectiveness of services. These include seed grants for new projects, programs or initiatives; equipment grants (including repairs or renovation); project/program grants; and operating grants.

» **Evergreen Grants** is a leading funder of nation-wide community and school greening projects, and provides training, design, maintenance advice, and a range of resources.

Best Practices & Trends

There are a number of best practices that can help Edmonton promote the aesthetic value of its open spaces. The examples below address the maintenance and enhancement of vegetation, which is often integral to the perception of an attractive public space; and the protection and valuation of scenery, which may inform the visual appeal of certain open spaces.

Scenic Value or Visual Resource Assessment

Planning for the preservation or enhancement of aesthetic value depends on being able to identify where important aesthetic or scenic resources are located. Scenic value assessment relies on one of two basic approaches: public visual preference surveys (assuming that scenic value is in the eye of the beholder), parameter-based scenic landscape inventories (assuming that scenic value is inherent in biophysical features that can be measured in terms of form, line, colour, texture, variety, or unity – classic components of human perception and aesthetic judgment in space and urban design theory); or a "quantitative-holistic approach" that combines both. The purpose of an assessment is to establish the scenic value of a place based on:

» The scenic quality of a landscape, based on characteristics like vegetation, terrain, water features, etc. and viewer experience/perception of those characteristics;

» The scenic integrity of a landscape, based on the impact of cultural modifications or human alterations (structures, resource extraction, or transportation infrastructure); and

» The visibility of the landscape from points of interest to viewers.

Since the 1970s, several government agencies (typically ministries of forestry, environment or land management) have developed methodologies and guidebooks for conducting inventory-based scenic resource assessments. One such assessment is the Scenic Resource Assessment of the North Saskatchewan Region (2011), produced for the Government of Alberta, Alberta Tourism.

Scenic Protection

While most people would agree that natural beauty and scenery is an important part of their aesthetic appreciation of place, scenic areas, vistas and view corridors are susceptible to change from both natural and development-related pressures. Identification and protection of these resources is an important part of aesthetic management in open spaces. The following strategies can help ensure that valuable scenery is protected:

» Educational and voluntary: Develop activities such as community walks, photo exhibitions, or presentations to inform residents about the importance of scenic areas and views, and to encourage voluntary protection. Conducting a visual assessment with community participation can help identify visual assets and liabilities.

» Incentive-based: Grants to community groups for educational programs or to land trusts can help preserve scenic quality. Other strategies include tax breaks for property owners who donate land or easements, and establishing an awards program to honour successful conservation efforts.

» Land purchase: Purchasing the most valued land is sometimes the only way to permanently protect scenic resources from development, and can provide the municipality with optimal control over management. Alternatively, land trusts can hold land or a partial interest in land for public benefit. Some land trusts use revolving funds to purchase threatened land and then resell it at cost to buyers who agree to land use restrictions.

» Transfer of development rights: Scenic areas can be preserved by transferring development rights from sensitive lands to "receiving" areas designated for growth. Usually these programs are accompanied by incentives such as increased development density, faster permit processing, less stringent design standards, or tax breaks to encourage program uptake.

» Regulation: Regulatory tools to help preserve scenic areas or views include design guidelines that limit the impact of development on scenic resources; zoning for view protection; and controls on intrusive signage or other blighting influences.

Naturalization

As opposed to designed or "manicured" landscapes, management agencies are increasingly turning to naturalization as an alternative technique to promote an aesthetically pleasing environment and realize a host of other benefits. Naturalization is achieved by using less disruptive management regimes (e.g. eliminating mowing) in combination with active planting of trees, shrubs and flowering plants (e.g. bulbs or seeds) that are found naturally in that ecosystem. Naturalization is appropriate in a number of circumstances:

» Sites that are unsafe to continue mowing;

» Spaces with low to no active use by citizens (e.g. grass along roadways);

» Passive or un-programmable spaces;

» Sites with community desire and requests to naturalize;

» Sites that have not been mowed for a number of years already and are considered stable grassland;

» Sites that already contain natural vegetation where further planting will enhance the area;

» Areas that have been identified as important for biodiversity conservation or creation/enhancement of wildlife habitat; and

» Areas where naturalization could enhance nature education opportunities.

3. FAMILY FARM, MARQUETTE COUNTY

This scenic 198-acre property in Wisconsin – which includes part of the John Muir family farm – was preserved for public use when it was sold to the Natural Heritage Land Trust.

Source: Brant Erickson via wisconsinlandtrusts.org

Precedents

The following precedents are intended to demonstrate success in delivering public open spaces that embody a sense of aesthetic appeal. For example, Vancouver, Portland, and Great Britain have enacted policy to protect views or landscapes with exceptional scenic value. Several parks are consistently identified among the most beautiful in the world, and the same sources emphasize some common features that make them aesthetically appealing: gardens, water features, fauna, view points, and spaces for reflection and appreciation, among others.

Scenic Resource Protection

» Vancouver, BC: 27 designated scenic view corridors and **View Protection Guidelines (1989)**

» Portland, OR: **Scenic Resources Protection Plan**

» Great Britain: 46 **Areas of Outstanding Natural Beauty** that are designated "in recognition of their national importance and to ensure that their character and qualities are protected for all to enjoy"

Golden Gate Park | San Francisco, CA

The 1,000-acre park is widely recognized as one of the most beautiful parks in America, and extends in linear fashion over 50 blocks from the heart of the city to the ocean. The park contains trails, woods, meadows, gardens, and museums. The San Francisco Botanical Garden contains an arboretum with a world-renowned collection of rare tropical plants, while the west side of the park features antique windmills and tulip gardens. The Japanese Tea Garden is one of the most picturesque parts of the park, including statues, lanterns, and an azalea-covered waterfall.

4. ROYAL BOTANIC GARDENS

This 100-acre park features a myriad of colourful, tropical plants.

Source: Emmanual Eragne via Flickr.com

Royal Botanic Gardens | Melbourne, Australia

This 100-acre park features expansive vistas, peaceful lakes, and a collection of 50,000 plants, many of which are colourful tropical species. The gardens are also home to native black swans, bellbirds, cockatoos and kookaburras, which visitors can spy on guided nature tours. During the warmer months, the gardens provide a venue for cultural performances and exhibitions.

5. IBIRAPUERA PARK

This park in Sao Paulo highlights nature to provide an aesthetically pleasing, relaxing environment for city dwellers.

Source: PortBay Hotels via Flickr.com

Ibirapuera Park | Sao Paulo, Brazil

This park is Sao Paulo's centre of activity and recreation, providing an attractive location for relaxing on lawns and admiring panoramic views of downtown. The park features jogging and biking paths and bridges that overlook the water, as well as several buildings designed by world-renowned architect Oscar Niemeyer.

Community Building

Open spaces make cities. They act as gathering spaces – anchors – that facilitate social interactions and provide space for programming such as community events (i.e. farmers markets, art fairs). Open spaces created in partnership with the local community foster a sense of community identity and ownership.

Key External Stakeholders / Organizations

The following stakeholders are key players in bringing people together to build and activate public open spaces. They comprise business, arts, environmental, and community services organizations that influence the programming, events, and volunteer opportunities that leverage open space to forge social cohesion within a neighbourhood.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that are involved in building and fostering communities within the city.

Alberta Agriculture

Business Revitalization Zones (BRZs)

Centre for Public Involvement

Confederacy of Treaty 6 First Nations

Creative City Network of Canada

EcoCity Edmonton

Edmonton Arts Council

Edmonton Catholic School District

Edmonton Chamber of Commerce

Edmonton Chamber of Voluntary Organizations

Edmonton Community Sustainability Partnership

Edmonton Federation of Community Leagues

Edmonton Public School Board

Evergreen

Faith communities

Green Communities

Make Something Edmonton

Métis Nation of Alberta

Seniors' clubs and associations

Sustainable Food Edmonton

Relevant Plans & Policies

One of the most important functions of open spaces is their role in community-building. They provide neighbourhood landmarks and points of social engagement – casual interactions on a patio or playground, gatherings during community events like festivals or farmers' markets, friendly encounters while working the community garden. These types of interactions help to build social capital by breaking down perceived barriers among diverse peoples and providing them with common interests in common spaces. Social interaction also intersects with the function of promoting wellness among Edmontonians by combating isolation or loneliness, especially among seniors, and fostering the healthy socialization and development of children.

Welcoming spaces are also place makers: they enliven the public realm, provide a reason for visiting an area, and make communities more desirable and livable. A virtuous cycle is formed that reinforces open spaces as important social and cultural hubs in a community. Finally, vibrant open spaces can contribute to a sense of neighbourhood identity, encouraging community pride and ownership. Involving the community in planning and maintaining open spaces brings people together and encourages civic participation.

Several policy and planning documents acknowledge the value of open spaces as community-builders, but few provide explicit guidance on how to encourage that role. Below are some of the plans and policies that position open spaces strongly in Edmonton as place makers and sites for gathering, interaction, and community involvement.

The Ways

According to **The Way Ahead: Edmonton's Strategic Plan 2009-2018,** "The concept of livability is based on the knowledge that the economic and social life of the community is intimately linked to its natural and built environment." As physical and social cornerstones of their communities, public open spaces have an important role to play in achieving livability in Edmonton.

The Way We Live: Edmonton's People Plan (2010) explains how the City of Edmonton can improve livability and create a "diverse and inclusive city by connecting people, creating communities where people can age in place, and actively nurturing an arts, culture and athletic community." The Plan envisions people services – including not only essential services, but also parks, natural spaces, and the celebrations that happen within them – as conduits that reflect relationships among residents and that help build a sense of wellbeing and belonging. The following policy guidance is particularly salient to planning for the community-building role of open spaces.

» Goal 1: Edmonton is a vibrant, connected, engaged and welcoming community.

- Objective 1.1: The City of Edmonton provides opportunities in neighbourhood, community and public spaces to connect people and build vibrant communities. This might include programming, events and activities in open spaces, or partnering with community leagues to improve open spaces.

- Objective 1.2: The City of Edmonton uses its social and physical infrastructure… to create connections. Access, accessibility, and well-maintained infrastructure encourage the use of open spaces, enabling social encounters.

» Goal 2: Edmonton celebrates life!

- Objective 2.2: The City of Edmonton provides for the well-being of its citizens through outstanding parks, natural, green and public spaces. Open spaces build community and a sense of social inclusion.

- Objective 2.4: The City of Edmonton has a vibrant, diverse sports sector for all Edmontonians. Providing well-maintained sports facilities – including fields and outdoor equipment – helps promote participation in sports activities, which in turns helps foster social engagement.

- Objective 2.5: The City of Edmonton promotes the celebration of diversity, milestones, achievements and festivals. Open spaces are essential venues for celebration and gathering.

- Objective 2.6: The City of Edmonton hosts world leading arts, cultural, sports and entertainment events at venues that attract a local, regional and global audience. Parks, plazas and other open spaces are key places for festivals and cultural events, which bring communities together.

» Goal 3: Edmonton is a caring, inclusive and affordable community.

- Objective 3.1: The City of Edmonton nurtures a caring and inclusive society. This might include designing its open spaces to promote intercultural awareness, encourage volunteerism, and practice inclusion and accessibility by implementing barrier-free infrastructure.

» Goal 4: Edmonton is a safe city.

- Objective 4.1: Edmontonians enjoy safety and security of person, place and community. This especially includes designing open spaces using CPTED principles and ensuring adequate enforcement of undesirable activity, in order to encourage comfortable and welcoming environments.

- Objective 4.2: The City of Edmonton and its citizens share responsibility for social order and crime prevention. Volunteerism and Adopt-A-Block programs can encourage a sense of ownership over community open spaces.

» Goal 5: Edmonton is an attractive city.

- Objective 5.1: The City of Edmonton promotes civic pride through attractive design. Unique and beautiful open spaces encourage community use and foster a sense of identity.

- Objective 5.2: The City of Edmonton showcases its vibrant arts, culture, entertainment, sports and retail districts. Public art installations and Winter City or special events programming make open spaces welcoming gathering places.

- Objective 5.3: The City of Edmonton takes pride in and showcases its green spaces and natural places. Quality open spaces and the activities, events and programming within them encourage social gatherings and interaction, and promote sense of community.

- Objective 5.4: The City of Edmonton honours and preserves the unique character and history of all neighbourhoods. This includes the community art and heritage landscapes within open spaces that encourage a unique sense of neighbourhood identity and community pride.

- Objective 5.5: The City of Edmonton works with citizens to keep Edmonton clean. Proper maintenance encourages residents to use open spaces, and engaging residents to help maintain them encourages a sense of ownership.

» Goal 6: Edmonton is a sustainable city.

- Objective 6.1: The City of Edmonton is a socially sustainable society. This might include neighbourhood capacity building strategies, volunteerism, and educational programs that promote social interaction in open spaces.

- Objective 6.2: The City of Edmonton is an environmentally sustainable society. This includes educating residents about urban agriculture and environmental best practices in open spaces.

The supporting **Implementation Plan (2012)** provides detailed actions to effect the policies of The Way We Live. A selection of actions that support the community-building function of open spaces include:

» Implement the Great Neighbourhoods Framework;

» Develop volunteer opportunities;

» Animate Churchill Square year-round;

» Develop an access strategy to sports and recreation for multicultural and Aboriginal groups;

» Develop a community stewardship framework;

» Support multicultural and Aboriginal communities in accessing or developing physical spaces to meet and recreate;

» Develop and implement a city-wide public spaces strategy;

» Fund parks construction and improve Edmonton parks; and

» Improve security and access in parks.

Fresh: Edmonton's Food and Agriculture Strategy

Open spaces are often host to food-related activities, from urban agriculture to restaurant patios and picnics. Although the plan is summarized in greater detail elsewhere (see the Food Production Brief), **Fresh: Edmonton's Food and Agriculture Strategy** bears some attention here because of the role of food in community-building. Parks and open space have a vital role to play in hosting food festivals, farmers' markets, community gardens, and urban farms – events and activities that bring people together and create community.

One of the key goals of the plan is to achieve "more vibrant, attractive and unique places." The plan envisions that "food has a strong presence in the public realm" and makes Edmonton "more livable and interesting." It provides strategic direction in order to enhance local food culture, celebrate food, and "animate and enliven shared spaces." Specific actions relevant to the community-building function of open spaces include:

» Develop initiatives to celebrate and promote local food, including community gardens. Engage immigrant group associations and social service providers to participate.

» Examine City regulations to encourage sidewalk patios.

» Enable fresh food kiosks and mobile markets in food deserts and high pedestrian traffic areas.

» Encourage street vendors, including food trucks.

» Support urban agriculture opportunities, like leasing City-owned land, inventorying lands that could be used for urban agriculture, creating guidelines to integrate urban agriculture into public spaces, or working with developers to provide infrastructure for urban agriculture.

» Support farmers' markets and food festivals like Taste of Edmonton.

Capital City Downtown Plan (2010)

The Capital City Downtown Plan (2010) policy framework envisions a "sustainable, vibrant, well-designed, and accessible" downtown. While the policies and actions in the Plan influence a number of open space functions, most of them serve to improve livability, community, and sense of place in the downtown. The following are some of the key policy directions in the Plan:

» Enhance social and cultural well-being. Provide venues for

  • Cultural expression and celebration;

  • Safe spaces for gathering to foster social interaction, community participation and collaboration, and social inclusion for all ages; and

  • Landmark gathering spaces that increase the sense of community and ownership.

» Enhance viable and healthy life-sustaining natural systems by expanding and maintaining vegetation, community gardens, landscaping, and green infrastructure that provides aesthetic value.

» Create a vibrant arts and entertainment scene by providing spaces that celebrate culture through art, festivals, and special events.

» Promote a well-designed downtown.

  • Encourage design excellence and beautify the downtown by reinforcing the special identity of different downtown districts and places.

  • Create a well-defined public realm by providing a diversity of open spaces to serve as community gathering places to celebrate the winter climate.

  • Celebrate heritage resources.

Specific policies and actions that support these objectives include:

» A detailed downtown Urban Design Strategy, intended to improve the aesthetic value of the public realm, which should:

  • Incorporate opportunities in open spaces for active components such as open-air markets, street vendors, sidewalk cafes and exhibits on public and private land in the Downtown.

• Promote the animation of parks and open spaces by providing public art, festivals, special events and recreational programming throughout the year.

• Collaborate with downtown stakeholder groups in these activities.

• Ensure that plans for new parks and for the redevelopment of existing parks follow design guidelines for Crime Prevention Through Environmental Design (CPTED).

» Install interpretive monuments in public spaces and undertake public art commissions.

» Expand public art programs, and provide financial, marketing and promotional support for downtown festivals.

» Provide neighbourhood gathering spaces and public places throughout downtown that encourage 24-hour use.

» Promote special events including farmers' markets, parades, seasonal street vendors, buskers, and other festivities.

» Incorporate CPTED and universal design into public spaces.

» Encourage community involvement in design and improvement projects.

City Centre Area Redevelopment Plan (2012)

The City Centre ARP establishes a master plan for the new Blatchford community development on the site of the former Edmonton City Centre Airport. The neighbourhood is a key example of open space as a primary driver of place-making and a community anchor that promotes healthy, sustainable urban living. The concept envisions a large central park that will attract Edmontonians from across the city to use its multi-use trails, picnic spaces and toboggan hill, and whose ponds will provide stormwater management for the neighbourhood. Other features include community gardens; superior urban design in civic spaces; walkable, mixed-use streets and complete streets; and an emphasis on attractive landscaping, public art and heritage interpretation elements. Low-Impact and Transit-Oriented Development techniques contribute to environmental sustainability.

Designing New Neighbourhoods: Guidelines for Edmonton's Future Residential Communities

Designing New Neighbourhoods places an emphasis on place making in new communities. Guiding outcomes and principles that have the most impact on community-building in open spaces include:

» Neighbourhoods are unique and inviting, conveying a sense of place. This can involve attractive parks and open spaces, and creating a special character by respecting the historical, natural and cultural context of an area.

» Neighbourhoods are inclusive, including universally accessible and age-friendly infrastructure, parks and facilities.

» Neighbourhood amenities support the social and recreational needs of residents, including flexible, visible, accessible and functional parks and open spaces to meet life cycle needs of residents.

» Neighbourhoods embrace all seasons including parks and open spaces that encourage year-round use, enjoyment, comfort, safety, fun and interest.

» Neighbourhoods are safe and secure.

Edmonton's Winter City Strategy

A key theme of **For the Love of Winter: Edmonton's Winter City Strategy** and its supporting **Implementation Plan and Winter Design Guidelines** is the role of the public realm in encouraging Edmonton to embrace winter. (The Plan is also discussed elsewhere with respect to different open space functions; see the Aesthetic Value and Destination and Tourism Briefs.) Open spaces are called upon to provide places for gathering, programming and events that are intended to enliven the city, and to provoke a sense of fun and community pride during the cold winter months. On a greater scale, the Plan attempts to establish policies to foster stronger community spirit and social interaction throughout Edmonton, in large part by leveraging the public realm to entice people outdoors where they can encounter others and activate disused spaces. Some actions identified to support these goals include establishing "anchor points" (e.g. warming huts, fire pits, cafes) throughout the river valley; partnering with local businesses to program outdoor winter gathering spaces; developing outdoor skating rinks; incorporating design elements that encourage people to gather and linger in public places; and addressing means to promote outdoor patios, events, and festivals year-round.

1. URBAN EDEN COMMUNITY GARDEN

This community garden on Bellamy Hill, near downtown Edmonton, helps encourage social interaction and sense of community.

Source: Elyse Williams via thelocalgood.ca

1.

Accessibility

In order to provide effective gathering places and social landmarks, open spaces must accommodate a diversity of users. A number of policies provide guidance on making open spaces welcoming and accessible for all, including:

» **Alberta Safety Codes Council Barrier-Free Design Guide (2008)**

» **City of Edmonton Community Facilities and Parks Accessibility Guide (2010)**

» **City of Edmonton Aging in Place Study (2007)**

» **Vision for an Age-Friendly Edmonton Action Plan (2011)**

» **Child Friendly Edmonton Strategy (2006)**

Relevant Projects & Programs Underway

The following projects and programs engage Edmontonians to build community capacity, promote volunteerism, and connect with each other. While some programs rely on open spaces to foster social interaction, others support the civic engagement that can be important for community ownership of parks and other public spaces.

» **Naturescapes** is a program that allows school children to learn about native plants and prairie plant communities through planning, developing, and maintaining naturescapes, which can include vegetable and flower gardens.

» **Great Neighbourhoods** is a City of Edmonton corporate-wide initiative to ensure neighbourhood-oriented co-ordination and delivery of City services. This initiative places emphasis on City departments working more collaboratively with each other and with community stakeholders to shape Edmonton's future.

» **Abundant Community Initiative** is an accessible, asset-based community development model of practice. It provides neighbourhoods with a process to develop a sense of connectedness and formation of social networks, and the capacity to address common neighbourhood goals.

» **Community Gardens** provide healthy, affordable food and excellent recreation for residents while promoting a sense of community and social interaction. Edmonton has over 30 community garden groups and 60 unique garden sites, including an outdoor learning garden at George P. Nicholson School, and the outdoor school and community garden at Mother Teresa School.

» **Leisure Access Program** facilitates access to City of Edmonton recreation facilities and programs for low-income people by offering free admission to participating facilities and discounted program registration fees.

» **Inclusive Recreation for People with Disabilities Guide** is an annual publication that highlights facilities, activities and programs run by a variety of organizations that are suitable for people with physical or developmental challenges.

» **CITYlab** is a unit within the City Planning branch that uses placemaking as a tool to engage Edmontonians in conversation about how cities evolve, connect people to place and to each other, learn by testing or piloting innovative ideas, and educate citizens about City planning goals. Completed projects include a public documentary screening, space animation, a street festival, rainbow crosswalk pilot, and other placemaking experiments designed to engage the community in building a sense of place.

» **Make Something Edmonton** is an online portal and City image strategy dedicated to connecting Edmontonians who have an idea to "make something". Over 600 projects have been submitted, including community murals, pop-up cycling lanes, neighbourhood festivals, and other community-building projects and events. The portal is also the public face of 100in1Day, an international movement that encourages citizens to participate in local, small-scale and/or temporary projects that improve quality of life in their city.

Volunteerism encourages social interaction and promotes a sense of ownership. There are countless volunteer-based programs to manage, monitor or improve public open spaces in Edmonton, including:

» **Adopt-a-Block**

» **Root for Trees**

» **Partners in Parks**

» **Capital City Clean Up**

2. OLD STRATHCONA RAINBOW CROSSWALKS

A member of the Civic Events Implementation Team at one of the crosswalks painted in rainbow colours for Pride Day, 2015.

Source: transforming edmonton.ca

Relevant Funding Streams & Mechanisms

The following funding sources emphasize community capacity-building, community partnerships, community-based projects, and/or volunteerism. Parks and other open spaces could be incorporated into community projects or programming, or could themselves be the beneficiaries of volunteer activities.

» **EcoAction Community Funding Program** is funded by Environment Canada to address environmental issues in communities. Non-profits organizations are eligible (municipalities are not directly eligible). Applicable issues include: clean air; clean water; climate change; habitat restoration and conservation.

» **Federal Gas Tax Fund** supports the development of public transit systems, and water/wastewater systems, solid waste management, community energy systems, and community capacity building.

» **Alberta Ecotrust Grants** are community grants, major grants, multi-year grants, and youth environmental stewardship grants for projects that address pressing environmental issues in Alberta. In Edmonton this is administered through the **EcoCity Edmonton Community Sustainability Grants**, which provide three streams of funding for projects that address climate change and energy, nature and land use, water, and air issues:

- Energy Transition Acceleration Grants
- Community Mobilization Grants
- Community Engagement Grants

» **Alberta Lottery Fund** is funded by the government's share of net revenue of video lottery terminals, slot machines, and ticket lotteries. This fund is used to support thousands of volunteer, public, and community-based initiatives annually.

» **Alberta Community Initiatives Program (CIP)** supports project-based initiatives in areas such as community services, seniors' services, libraries, arts and culture, sports, education, and health and recreation. Maximum grant is $75,000 per project per year; funding is approved on a matching grant (met by financial contribution, volunteer labour, services, or donated materials or equipment) basis.

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhood play, wellness, and learning through active partnerships with the community.

» **City of Edmonton Community Investment Operating Grant program** provides operating assistance to Edmonton non-profit organizations whose activities benefit citizens of Edmonton with regards to social services, intercultural relations, or recreation/sport/leisure, including athletic, physical, historical, natural science, cultural, social and intellectual activities.

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» **Evergreen Grants** is a leading funder of nation-wide community and school greening projects, and provides training, design, maintenance advice, and a range of resources.

» **Federated Co-operatives Limited Community Investment Fund** provides funding for non-profit or charitable organizations for projects or events that align with the interests of employees and that align with FCL's social responsibility program, which includes environmental sustainability and volunteerism, among other criteria.

Best Practices & Trends

The following best practices address how public open spaces can become places that encourage use by a diverse populace, thereby becoming gathering spaces that anchor a neighbourhood, promote social interaction, and foster a sense of identity and ownership. Prevailing trends also draw attention to the need to design and manage open spaces in collaboration with the community in order to address equity and accessibility needs, in order that such spaces remain useful and welcoming for all.

Place making

» The **Project for Public Spaces** is a non-profit planning, design and educational organization that helps create and sustain public spaces, with the aim of building stronger communities. One of their trademark "products" is an approach to place making that builds on the work of William (Holly) Whyte, who completed pioneering studies of the social functioning of public open spaces. Their **11 Principles for Placemaking** (from their 1999 book How to Turn a Place Around) outline "key elements in transforming public spaces into vibrant community places", and encompass many of the best practices for community building in the public realm. These are distilled below.

- Involving the public can build community ownership over the project and the space, and can tap their knowledge and insights about the space.

- The goal of the design is to create a sense of place. Physical elements should make people feel welcome and comfortable (e.g. seating, landscaping, pedestrian circulation networks, relationships to surrounding uses).

- Partners are useful to help plan a project, sustain its momentum, and build a constituency that will be invested in its future.

- Identifying how people are using the space, determining which features they prefer, and continuing to observe user behaviours over time allows the designer to evaluate what to include or exclude in the design.

- The project should have a clear, unique vision of what types of activities are intended for the space, and a focus on providing a comfortable, attractive space where people want to spend their time.

- Experimental improvements or pilot projects (e.g. seating, public art, community gardens) can overcome complexity and build community support in the short term.

- The choice and arrangement of different elements or amenities in relation to each other can prompt social encounters and interactions (i.e. triangulation).

- Small-scale, community-building improvements can demonstrate the importance of place and help overcome political or financial obstacles.

- Although design is important, the form should be determined organically from community input, understanding of context, experimental interventions, and collaboration to overcome obstacles.

- The elements that make a place "work" – the vendors, flowers and seating – represent minimal expense in comparison with the basic infrastructure of a public space, particularly with the involvement of the community in programming and other activities, and their support and enthusiasm for the project.

- Great public spaces are managed to acknowledge the changing needs and desires of a community.

3. BRYANT PARK, NEW YORK

Once a haven for crime, this park was redeveloped according to the recommendations of Whyte's Street Life Project, including improved permeability, trees, food kiosks, gardens, and seating.

Source: Peter Mauss (Esto) via asla.org

Park Equity

One important community-building outcome of public open spaces is their ability to reduce social and environmental inequities – to provide amenities equally to different neighbourhoods, regardless of socio-economic status or ethnic composition. However, redeveloping parks and other open spaces opens the door to environmental gentrification, whereby the very amenity that is supposed to be benefiting the neighbourhood instead attracts wealthier residents to the area, resulting in higher rents and potential alienation of the original community members. Solutions include establishing a community land trust that would preserve properties off-market, or requiring affordable housing near the new amenity. Equity can also be safeguarded to some extent by using an engagement model that involves local stakeholders in designing the space to meet their needs (as opposed to the needs of visitors or tourists) and in forming groups that can develop activism and ownership over the space.

Community Engagement

Public open spaces are no longer places designed or used in a vacuum. Instead, the most successful places have a well-developed sense of community pride and ownership. Public involvement can begin as early as the design (or redevelopment) stage of a project by connecting with community members to determine the changes they most desire in their neighbourhood, and engaging in collaborative design workshops. The City, in partnership with community organizations, can help make open spaces a key part of community identity and encourage civic participation by providing programs and funding for volunteer events (e.g. tree planting), space activation (e.g. community support meetings, fitness and leisure events), or park sponsorship (e.g. Adopt-a-Park). Likewise, public murals and other forms of community art can bring people together to help create their own spaces.

Accessibility

Open spaces are considered public places and facilities, and as such, should incorporate universal design wherever possible in order to make them effective, welcoming gathering places for the entire community. This includes provisions for people with mobility, visual, or auditory restrictions or impairments. Not only should everybody be able to access open spaces – for instance, using ramps and no-curb entrance features – but open space elements (e.g. benches, picnic tables, playgrounds) should also be selected with restrictions or impairments in mind. The following resources provide useful best practices and guidance with regards to designing for accessible public spaces:

» **Alberta Safety Codes Council Barrier-Free Design Guide (2008)**

» **Americans with Disabilities Act Standards for Accessible Design (2010)**

» **US Forest Service Accessibility Guidebook for Outdoor Recreation and Trails (2012)**

» **City of Toronto Accessibility Design Guidelines (2004)**

4. BARRIER-FREE PATH

Trails with pavement or smooth surfacing with minimal protrusions (e.g. rocks, tree roots), like this one in Fairfield Park, Melbourne, are important for ensuring accessibility for the mobility impaired.

Source: Julie Mundy via walksmelbourne.com

Precedents

The following precedents demonstrate three open spaces that provide "cloud seeding" for community activism to create, protect and maintain an important community asset; and that act as prominent focal points for gathering, socializing, and community identity.

Liz Christy Community Garden | New York, NY

The Liz Christy Community Garden was established in 1973 as the first community garden in New York City. The garden is named for local resident Liz Christy and a group of gardening activists called the "Green Guerillas" as a means of combating the urban blight and decay in their neighbourhood. The group threw seeds over the fences of vacant lots, and planted sun flowers in street meridians. The group removed litter and debris from the vacant lot at the intersection of Bowery and Houston Streets in order to establish a community garden, which became a tool to reclaim urban land, stabilize city blocks, and encourage community members to work together to solve neighbourhood problems.

Plaza Hidalgo | Mexico City, Mexico

Plaza Hidalgo is an important centre of community life at the heart of Coyoacan, a suburb of Mexico City. A large church anchors one side of the square, and the balance of the square features a formal set of linear paths that act as connections between various destinations in the park. Nevertheless, activity is not constrained by the rigid nature of the paths, but rather flows flexibly throughout the square. On a typical day the plaza is activated by colourful market stalls, vendors, and people resting on the abundant benches, garden planters, and church steps, under shady trees, or near a small fountain. Gathering and lingering is encouraged by the absence of vehicles: local streets lead to the square, ensuring accessibility, but the space itself is a pedestrian area. The square is a focal point for civic pride, and is consistently active with residents and visitors alike.

Mont Royal Park | Montreal, QC

Mont Royal Park is not only a natural anchor for the Mont Royal neighbourhood, but also a central gathering place for the city as a whole. The park is a popular destination for recreation: its trails and hilly terrain are used year-round for hiking, mountain biking, cross-country skiing, and tobogganing. A recreational lake is used for boating in the summer and ice skating in the winter. Its large lawns and open spaces are used for lounging and picnicking, and lookout points draw residents and visitors for excellent views of the city. Every Sunday during the summer months, locals gather near the Sir George-Etienne Cartier monument for the Tam-Tams, which are a combination of informal musical performance (featuring hand drummers) and supporting dancers, artists and vendors. In 1986, Les amis de la montagne (Friends of the Mountain) was established to protect and promote the park with an emphasis on community engagement and environmental education, which continues today with awareness campaigns and volunteer opportunities. The park became a National Heritage Site in 1987.

5. MOUNT ROYAL PARK

This is a central gathering space in Montreal that acts as a major centre for community (and city-wide) programming.

Source: Christine Jackowski via Flickr.com
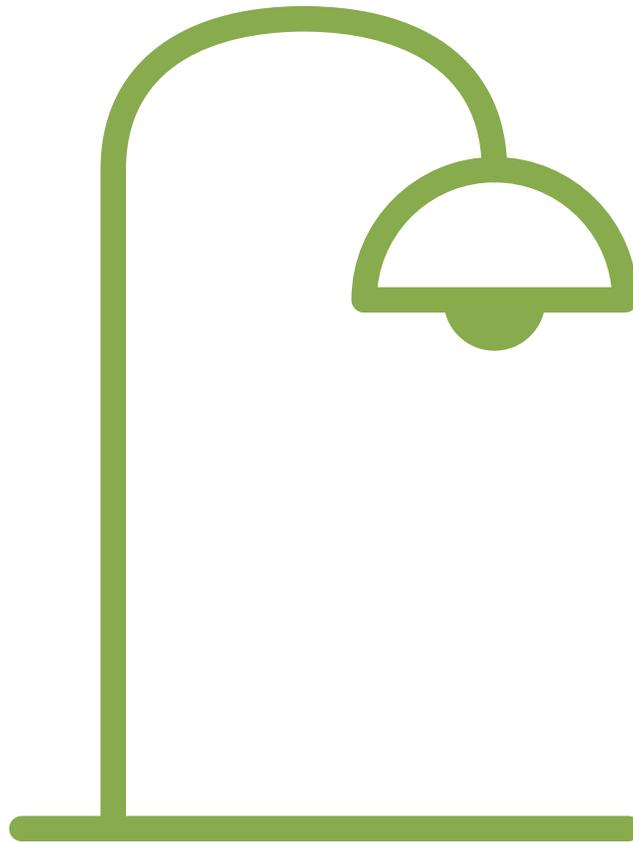
Public Safety

Trees and open spaces can contribute to public safety by creating a vibrant public realm, providing transitions between land uses where otherwise conflicts might occur (such as noise), and serving as a traffic calming device. Well-designed open space can help create safer streets for pedestrians and drivers.

Key External Stakeholders / Organizations

The following stakeholders bear an interest in open spaces in connection with their work in community building and community safety, public health, safe design, and crime prevention.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that are involved in creating safe communities, where the built environment promotes eyes on the street and an active, friendly, and accessible public realm.

Alberta Health Services

Block Watch groups

Business Revitalization Zones (BRZs)

Canadian Coalition for Public Health in the 21st Century

Canadian Playground Safety Institute

Canadian Public Health Association

Centre or Public Involvement

Edmonton Community Sustainability Partnership

Edmonton Federation of Community Leagues

Greater Edmonton Alliance

Health Canada

Millwoods Crime Council

Pan-Canadian Public Health Network

Pest Management Regulatory Agency

Public Health Agency of Canada

REACH Edmonton Council for Safe Communities

Royal Canadian Mounted Police

Toxics Watch Society of Alberta

Transportation Canada

World Health Organization

Relevant Plans & Policies

Public open spaces are an important factor in supporting community safety and security. Responsible environmental design ensures that parks, squares and other open spaces feel safe and welcoming to users by discouraging crime and encouraging passive surveillance. Welcoming public spaces support frequent, casual contact among neighbours, which promotes social cohesion, active places, and "eyes on the street" – important precursors for strong, engaged communities and improved neighbourhood security. Well-maintained, landscaped spaces with a clear "purpose" can also reduce neighbourhood crime by signaling a sense of community ownership to potential offenders.

In addition, vegetated open spaces can help create safer adjacent streets by protecting them from crosswind gusts, glare and reflection, and by reducing driver stress. Some studies have shown that streetside trees or landscaping can alter driver perception, such that a clearly-defined edge (provided by vegetation) may promote a sense of safety for drivers, or may cause them to become more attentive and cautious. (The "edge effect" operates by affecting drivers' perception of lane width.) These perceptual changes (not to mention the playground zones, crosswalks, and other traffic calming devices that are designed into the street near parks) can reduce traffic speeds and collisions near green spaces. These characteristics do not include public safety benefits of open space where they intersect with public health and wellness, which are addressed only briefly here, but which are discussed in greater detail in the Climate Regulation, Risk Mitigation, and Mental Health and Wellbeing Briefs.

Finally, open spaces provide important buffers from nuisance or hazardous land uses. Landscaping strips provide comfort for pedestrians by separating sidewalks from highways or busy arterials, while more substantial setbacks may be regulated to protect residents from noise or visual pollution from airports, railway corridors or industrial areas. Buffers are also employed to protect people and property from hazardous areas, like floodways or steep slopes; however, this open space function is addressed in the Risk Mitigation Brief.

Open Spaces as Green Buffers

» The **World Health Organization Guidelines for Community Noise (1999)** establishes levels of background noise (in decibels) that are recommended in order to effectively address hearing impairment; interference with speech communication; sleep disturbance; psychophysiological, mental, and performance effects; and general annoyance and disruption of normal activities. The document also establishes guidelines for specific environments, such as dwellings, hospitals, and festivals. Parkland and conservation areas are recommended to preserve a quiet atmosphere and retain a low signal-to-noise ratio. **The Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Draft, 2011)** likewise enumerates the health impacts of noise exposure, which are considered by the agency when requested to comment on an Environmental Assessment application.

This guidance is important for open spaces not only to ensure that activities (e.g. music festivals, demonstrations) pose acceptable auditory impacts on attendees and nearby residents, but also because open spaces are often used to mitigate the auditory impacts of adjacent land uses by employing a "buffer" of land and vegetation.

» The **Alberta Subdivision and Development Regulation (AR 43/2002)** establishes setbacks from a number of facilities and infrastructures in order to ensure public health and safety. In practice, because of restrictions on the uses that can take place within them, these setbacks typically become part of the municipal open space network, whether or not they are extensively used by the public. Some of the developments that require setbacks include sour gas facilities, oil and gas wells, abandoned wells, wastewater treatment plants, landfills, and highways.

» The **Edmonton International Airport Zoning Regulations (CRC, c.81, 2009) and the Edmonton International Airport Vicinity Protection Area Regulation (AR 55/2006)**, together restrict the use of regulated lands surrounding the airport in order to protect aircraft and operations from potential hazards. Restrictions include the height of buildings, structures or natural growth; the use of land for

waste materials that might be edible or attractive for birds; and prohibiting certain uses within the different Noise Exposure Forecast (NEF) contours. Although most of the Protection Area falls within Leduc County, these regulations may be useful for future growth planning and regional planning of open space systems to incorporate NEF zones.

Supporting Public Health

Green open spaces also have a role to play in supporting public health. Trees and other vegetation have a large impact on urban air quality and microclimate regulation, which influence health effects ranging from asthma incidence to heat stroke. Discussed in greater detail in the Climate Regulation Brief, some policies and plans that have a bearing on the security of Edmontonians' health include:

» **Canada Ambient Air Quality Standards**

» **Alberta Ambient Air Quality Objectives**

» **Capital Region Ambient Air Quality Management Framework**

» **Capital Region Ozone Management Plan**

Similarly, the Green Network Strategy should take into account the public health and safety impacts of water quality and quantity, as regulated by the **Alberta Environmental Protection and Enhancement Act (2014)**. For example, green spaces have the potential to reduce water contaminants, but open spaces or parking areas with impermeable surfaces likewise must restrict storm water runoff in order to mitigate public hazards like flash flooding.

Safe Spaces and Places

» **The REACH Report (2009),** a product of the Taskforce on Community Safety, provides a roadmap for "building a culture of community safety in Edmonton in one generation." The Report enumerates nine recommendations that focus on developing community capacity to implement preventive approaches to community safety. Although the action items do not relate directly to the use of open spaces, realization of the social objectives would help to prevent crime in neighbourhoods in general, including their public spaces.

» A similar plan from the Community Sustainability Task Force is **ELEVATE (2012)**, whose objective is to "create solutions for Edmonton's mature neighbourhoods that are in distress." The Report comes to many of the same conclusions and recommendations as REACH, specifically the focus on building community capacity, and implementing preventive measures to reduce crime and support social development. Some of the action items pertain specifically to adjustments of the public realm, including:

- Action 3.5: Encourage all development plans to include public space, so that [the streetscape] encourages safety, community interconnectivity, and multi-modal transportation.

- Action 3.6: To reduce crime, Community Leagues and other community-based organizations should develop strategies to reconsider public spaces that are suffering from inappropriate use and abuse. The [Edmonton Community Sustainability Partnership] and its partners will support the redevelopment of vacant lots and derelict housing.

- Action 5.2: The ECSP will work with the City and communities to address concerns about the enforcement of regulations and distribution of information that keep residents and businesses safe.

- Action 5.5: Develop a beautification and public façade improvement policy that incorporates Crime Prevention Through Environmental Design (CPTED) principles.

The Report also contains many recommendations aimed at developing a strong sense of community and ownership, which is effective at supporting community safety and security.

» Open spaces that are safe for public use rely on responsible application of chemical management techniques in landscaping. Although discussed in further detail in the Biodiversity Brief, the **Integrated Pest Management Policy C501** and the maintenance of 45 **herbicide-free parkland areas** are designed to limit public exposure to pesticides and herbicides, and orient landscape management toward preventative, ecosystem-based, and/or least toxic alternatives.

» **The Edmonton Design and Construction Standards, Volume 5: Landscaping (2015)** have already been addressed in some detail in the Aesthetic Value Brief. However, landscaping in public open spaces also impacts the ability of the public realm to deter crime (for example, by creating intentionally-landscaped spaces or reducing vegetation that can screen spaces from view), positively influence street safety, and improve utility rights-of-way without compromising their safety. The Standards regulate these aspects of landscaping in public spaces by establishing appropriate location, spacing, and species selection to maintain pedestrian safety, sight lines, and utility clearances. In addition to landscaping, adequately designed and maintained infrastructure is important to ensure pedestrian safety. **Volume 2: Roadways (2011)** establishes safe design standards for walkways, paths and trails.

Although discussed elsewhere (see the Aesthetic Value Brief), some City Bylaws have implications for the safe and lawful use of open spaces. Some of the more important bylaws include:

» **The Parkland Bylaw C2202** prohibits park users from engaging in disruptive or destructive activities in parks, including littering, vandalism, starting fires, or engaging in activities that might injure another person or damage property. The Bylaw also prohibits accessing parks between 11 PM and 5 AM. The purpose of the Bylaw is to make parks and other open spaces safe for their users, and to discourage the use of parks for criminal activity.

» The **Community Standards Bylaw 14600** regulates certain activities on privately owned property and immediately adjacent areas. The use of private property has the potential to impact on the amenity provided by public spaces, so planning efforts should consider coordination with adjacent landowners in the case of any conflicts. The Bylaw prohibits a landowner from permitting a "nuisance" on their property, i.e. activities or conditions that compromise the peaceful enjoyment of the surrounding environment. Some of these conditions have the potential to attract crime or compromise the safety of public spaces, i.e. offensive odours, vegetation that obstructs sidewalks, graffiti or damage to structures, or disruptive noise.

Relevant Projects & Programs Underway

The following programs focus on community crime prevention through social engagement, surveillance, and design, which can help to make public open spaces contributors to a safe public realm.

» **Neighbourhood Empowerment Teams (NET)** is a program of the City of Edmonton, the Edmonton Police Service, The Family Centre, and the United Way of the Alberta Capital Region operating in five Edmonton neighbourhoods. Teams work alongside the community to offer a mix of social, policing and youth services to Edmonton neighbourhoods for a period of two to four years, with the ultimate goal to reduce crime.

» The RCMP supports a number of programs that partner with residents to monitor community safety, including **Neighbourhood Watch and Community Patrol Program.**

» The Edmonton Police Service, alongside Parks and Community Services and community members, perform **CPTED assessments** of both private and public spaces to evaluate whether there are any elements that can be altered or installed to deter crime. Also hosted by EPS are four-day **CPTED workshops**, which take place twice per year. Workshops involve property management, law enforcement, security/ risk management, public transportation, and neighbourhood development.

Relevant Funding Streams & Mechanisms

The following funding sources focus on community-based crime prevention, injury prevention, park improvement, and other community projects. Funding could be used on both design-based interventions (e.g. removing graffiti, installing safer playgrounds) and social interventions (e.g. community engagement programs) to support safe and welcoming open spaces.

» **RCMP Foundation Grants** are available for community projects related to the RCMP community policing program, particularly initiatives for the benefit of youth at risk.

» **Alberta Community Injury Control Fund** is a program of the Injury Prevention Centre, funded by Alberta Health, that supports local, collaborative injury prevention projects to improve community safety. Priority areas include falls and playground-related injuries, as well as leading causes of injury among target populations (e.g. children and seniors, lower-income persons, Indigenous and ethnic persons).

» **The Allstate Foundation** provides grants to charities and non-profit organizations for initiatives related to crime prevention, road safety or home safety.

» **Edmonton Community Foundation Community Grants** provides funding for a wide range of projects and programs that meet a need in the community, strengthen organizational capacity, and promote collaboration and sharing among agencies to reduce duplication of programs or improve effectiveness of services. These include seed grants for new projects, programs or initiatives; equipment grants (including repairs or renovation), project/ program grants, and operating grants.

» **City of Edmonton Neighbourhood Park Development Program (NPDP)** provides funding to non-profits to support improvements to parks at the neighbourhood level to guide, facilitate, and support the creation of great spaces and fun places for neighbourhood play, wellness, and learning through active partnerships with the community.

1. COMMUNITY OWNERSHIP

This mural on 82nd Street celebrates the work of the 118th Avenue Neighbourhood Empowerment Team in Eastwood, and demonstrates community ownership of the area.

Source: transformingedmonton. ca

Best Practices & Trends

The following best practices describe how to locate and design open spaces to deter crime in a neighbourhood, and how open spaces can be used to support public safety by providing physical "buffers" between incompatible land uses.

Green Space Buffers

In addition to ecological corridors, riparian protection zones or aesthetic landscaping/screening strips, linear open spaces are often used as "buffers" in a number of applications that impact on public safety and enjoyment of urban environments. They generally provide separation between the general public and a nuisance or hazardous land use for the purpose of noise attenuation (e.g. railway corridors, industrial or resource extraction uses, airports, highways), pedestrian comfort (e.g. arterial roads), or protection of life and property (e.g. flood hazard areas, steep slopes, landfills, sour gas facilities). Green spaces are also typically preserved in utility easements and surrounding certain public works facilities (e.g. water treatment reservoirs) to not only ensure public safety, but also protect the integrity of the asset from disruption.

Creating Safe Spaces

» **Planning, Designing and Maintaining Safer Parks (1992),** published by the City of Toronto Department of Parks and Recreation, provides more detailed information for designers of public open spaces. It identifies several physical characteristics that park users associate with high-risk environments, such as poor lighting, confusing layout, physical and aural isolation, poor visibility and access routes, areas of concealment, poor maintenance, vandalism, or presence of threatening users. By contrast, "good design" meets the needs of users, provides diverse and interesting landscapes, connects people with place, and provides a positive image and experience. While it cannot necessarily eliminate perceptions of fear or opportunities for crime, it can create the preconditions for effective control. The guide provides specific design considerations to improve open spaces with respect to isolation, layout and legible design, visibility and sightlines, access and circulation, lighting, diversity of features and uses, signage and wayfinding, and access to help in case of danger.

2. EYES ON THE ALLEY PROJECT

This crime prevention project is a collaboration among the 118th Avenue Neighbourhood Empowerment Team and artist Christy Morin in an alley off Alberta Avenue.

Source: transformingedmonton.ca

» **Crime Prevention Through Environmental Design (CPTED)** is a multi-disciplinary approach to deterring criminal behaviour through the design of spaces and places, and a certification system administered by the International CPTED Association. CPTED strategies rely on the ability to influence decisions before they happen by adjusting the built and social surroundings to reduce opportunities for crime. By emphasizing modifications to the physical environment, CPTED complements community-based policing, Block Watch, and social programs that address the root causes of criminal behaviour. CPTED employs a number of common strategies to deter crime, reduce fear, and create defensible spaces:

- **Territoriality:** Foster residents' interaction, vigilance, and control over their neighbourhood.

- **Surveillance:** Maximize the ability to spot suspicious people and activities.

- **Activity support:** Encourage the intended use of public space by residents.

- **Hierarchy of space:** Identify ownership by delineating private space from public space through real or symbolic boundaries.

- **Access control or "target hardening":** Use physical barriers, security devices and tamper-resistant materials to restrict entrance.

- **Environment:** Design and locate the space to account for the surrounding environment and minimize the use of space by conflicting groups.

- **Image and maintenance:** Ensure that an area is clean, well-maintained, and graffiti-free.

In public open spaces, CPTED strategies might manifest in a number of actions, such as installing appropriate lighting for the space, placing covered outdoor areas in locations that discourage loitering, maximizing residents' ability to view public spaces (i.e. "eyes on the street"), encouraging use of public spaces, and avoiding dark or hidden areas near activity nodes.

It should be noted that CPTED is not the only approach for safe environmental design. Others include the SAFE Design standard (administered by the SAFE Design Council) or Designing Out Crime (a partnership between the University of Technology Sydney and the New South Wales Department of Justice, Australia).

3.

3. GREEN RAIL CORRIDOR

Rail corridors are a common example of green space being used as a buffer between a nuisance (e.g. noise, emissions, visual impact) and a residential area, like this buffer along the Lakeshore West GO Train corridor in Toronto.

Source: Wikimedia

Precedents

There are countless examples of open spaces that are effective in providing nuisance buffering, crime prevention, and traffic mitigation benefits. In comparison with some other functions of open space, public safety is largely taken for granted as a necessary condition of the urban public realm, rather than an intentional objective. Nevertheless, the following precedents attempt to demonstrate cases where open spaces have been used to support public safety in terms of public health and hazard avoidance benefits (from green buffers), and crime prevention and deterrence (from community engagement and space activation).

4. LEE VALLEY REGIONAL PARK

This East London park will help reduce the urban heat island effect, which exacerbated record-breaking heat waves in summer 2003 and led to health impacts from heat stress, reduced potable water, and risk from insect or rodent disease vectors.

Source: Peter Herring via urbanbluegreen grids.com

The East London Green Grid | London, UK

The East London Green Grid is a long-term project to develop a network of green spaces along the Thames Gateway, South Essex. The project is intended to deliver a range of benefits, including flood management, improved air quality, and noise abatement. The network will also provide green space for recreation and tourism, education, active transportation, and wildlife habitat.

5. SUMMER NIGHT LIGHTS

Basketball is only one of the activities that lends itself to play after dark, a technique used to introduce passive surveillance to parks in problem neighbourhoods in Los Angeles.

Source: cityparksalliance.org

Summer Night Lights | Los Angeles, California

Summer Night Lights is a program developed by parks operators and community leaders to improve safety and reduce crime in Los Angeles. Parks and recreation areas in lower income neighbourhoods were a frequent site of gang violence, which typically increased during the warm summer months. The program extended the open hours in eight parks in troubled neighbourhoods, keeping lights on until midnight, and sponsoring nighttime movies and family-oriented activities four nights per week. The program has expanded to 24 Los Angeles parks since its launch in 2008, and has contributed to a 57 percent reduction in gang-related homicides in those neighbourhoods. By empowering communities and targeting the summer months, the program became a national model for violence reduction.
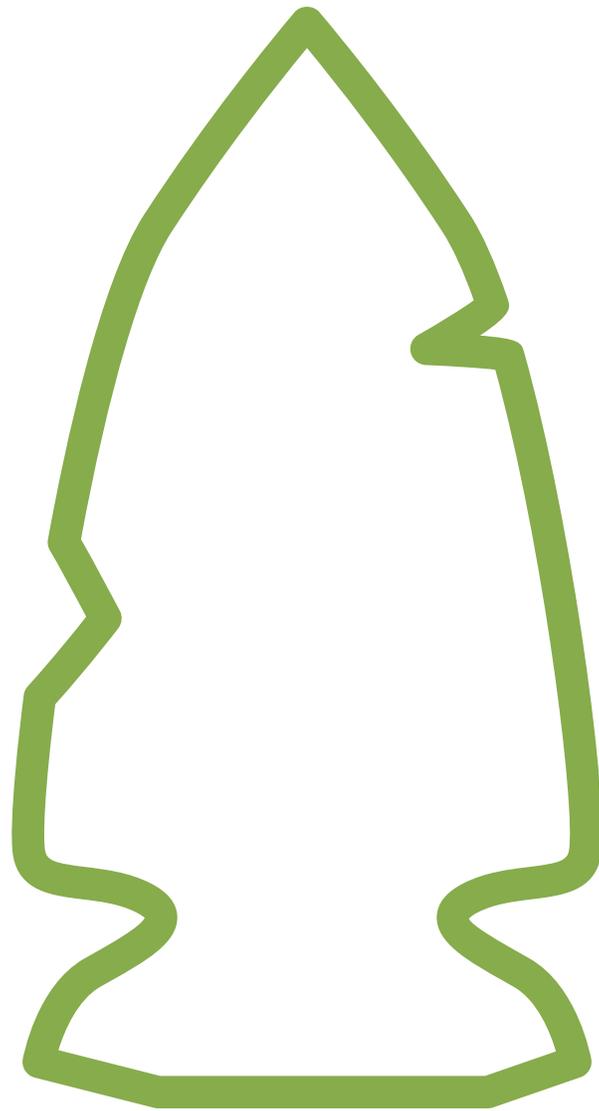
Heritage

Open spaces can be effectively used to highlight the cultural and historical significance of a site, a feature, or the city's heritage in general. Cultural expression in the form of public art often finds a home in the green network.

Key External Stakeholders / Organizations

The following stakeholders represent organizations and agencies that have a specific interest or responsibility for historic resources, their protection and conservation; that use or interact with cultural landscapes; and that create, support, or promote culture through public art.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that are active in protecting, promoting, celebrating, and raising awareness of the city`s cultural and historical legacy; the city`s heritage.

Alberta Culture and Tourism

Alberta Environment and Parks

Alberta Historical Resources Foundation

Canadian Association for Conservation

Canadian Heritage Information Network

Canadian Public Arts Funders

Creative City Network of Canada

Edmonton Arts Council

Edmonton Chamber of Commerce

Edmonton Federation of Community Leagues

Edmonton Heritage Council

Edmonton Historical Board

International Council on Monuments and Sites (ICOMOS) Canada

Ministry of Canadian Heritage

Museums, archives, and historical societies

Nature Alberta

North Saskatchewan River Conservation Society

Parks Canada

Relevant Plans & Policies

Public open spaces can be imbued with cultural and historical significance in numerous ways, from the intangible to the evident. Historic artifacts can sometimes be found in urban open spaces, including archaeological or paleontological resources. Sometimes the open space itself has heritage value by virtue of its traditional use by Aboriginal peoples or its association with people or events important to local history. Open spaces also promote cultural development as sites for public art installations or murals, with implications for aesthetic enjoyment and education. Open spaces as places for cultural gathering and celebration are discussed in the Destination Brief, and natural heritage is discussed throughout the Environment theme.

This brief identifies the plans and policies most relevant to promoting, managing or regulating cultural and historical resources in open spaces in Edmonton, with particular attention to considerations for master planning.

Conservation of Cultural and Historical Sites

» A number of **international agreements** establish guidance regarding the preservation and interpretation of cultural heritage, including the **UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003)** and the **ICOMOS Ename Charter for the Interpretation of Cultural Heritage Sites (2008).**

» The **Standards and Guidelines for the Conservation of Historic Places in Canada** is the essential guiding document for the identification and conservation of heritage places in Canada, and have been adopted as best practice by the Province of Alberta. The Standards comprise principles applicable to each type of conservation – preservation, rehabilitation, and restoration – while the Guidelines provide direction on how to interpret and apply the Standards to different conservation-related decisions. Specifically, the Guidelines bear upon public open spaces where they include cultural landscapes (areas that have been modified, influenced or given special cultural meaning by humans) or archaeological sites.

» The Alberta **Historical Resources Act** empowers municipalities to designate historic places through the passage of a local bylaw that legally protects designated resources from demolition or alterations that compromise their heritage value. Additionally, it establishes the framework for Historic Resources Impact Assessments, which are required if an activity is likely to result in the alteration of, damage to or destruction of a historic resource.

Historical Sites Management

» **Creating a Future for Alberta's Historic Places: Identifying, Evaluating, Managing** is a series of publications prepared as part of the Government of Alberta's Municipal Heritage Partnership Program, which supports municipal contributions to the Alberta and the Canadian Register of Historic Places, respectively. The manual is designed to help Alberta municipalities create and implement local heritage programs to protect historic places, and describes the steps involved in identifying, evaluating, and developing municipal historic places. Open spaces may be designated as municipal historic places under a number of criteria, including association with a cultural practice or historic event (for example, an Aboriginal ceremonial site); potential to yield information important to the municipality's history, prehistory or natural history; or landmark / symbolic value, whereby the place must be "particularly prominent or conspicuous, and must have acquired special visual, sentimental or symbolic value that transcends its function."

» The Edmonton **Historic Resource Management Plan (2009)** provides a long-term strategy to manage Edmonton's historic resources and establishes clear guidelines and summarization of City policies for addressing heritage resources and issues. The Plan has five core areas of activity that guide historic resource preservation:

- Register and inventory historic resources through the continual maintenance, update and review of the Register and Inventory of Historic Resources in Edmonton to ensure that resources are identified and recorded;

- Identify and create incentives, initiatives or policies to encourage restoration and rehabilitation;

- Promotion to raise the profile of the benefits that heritage conservation brings;

- Monitoring to ensure that historic resources are accounted for in the development process; and

- Integrating the Historic Resource Management Program with other heritage initiatives, e.g. museums, archives, archaeological efforts.

With respect to open spaces, Heritage Policy 1 states that "The City will develop and maintain a comprehensive document [the Register] that identified all historic resources and areas in the City that are of architectural, social and cultural value." Although traditionally only buildings were considered, the policy notes that the Register might be broadened to include cultural or natural landscapes and archaeological features. At the moment, open spaces are addressed more explicitly under the following policies:

- **Policy 22**: Significant landscapes, icons, viewscapes and activities that contribute to the city's urban fabric and character will be afforded appropriate recognition and suitable protection. Supporting actions include creating an inventory of significant historic cultural or natural landscapes, corridors, or locations; designating significant natural/cultural landscapes; and developing zoning regulations or guidelines for significant cultural landscapes.

- **Policy 23:** The City will document and map archaeological and paleological sites and integrate them into the development decision making processes. Supporting actions include developing an archaeological / paleological plan or overlay for planners to reference to help with decision-making, and developing setbacks from sites.

- **Policy 24:** The City will document and map all known First Nations, Metis and Inuit sites, burial grounds and areas of cultural significance and integrate them into the development decision making processes. Supporting actions include developing a plan or overlay that identifies significant sites, and developing setbacks from sites.

Public Art

Public art contributes significantly to the cultural value of open spaces: it builds the attractiveness and identity of the city, reinforces neighbourhood character, strengthens the local economy by supporting local artists, and encourages the image of a progressive municipality. The City of Edmonton has adopted several plans and policies that address public art, as follows.

» **Edmonton Public Art MAP: Public Art Master Plan (2008)** was developed by the Edmonton Arts Council and approved by the City to provide the "infrastructure, programming, and initiative for an increase in the scope of public art for the city of Edmonton." The Plan is designed to develop exhibitions and a collection of public art based on artistic excellence and international significance, and that enhances the visual and aesthetic impact of the city. Edmonton is envisioned to become "a laboratory for artistic expression and the engagement of new ideas." The Plan makes a series of recommendations for:

  • Addressing critical needs to prevent deterioration of existing public art assets, e.g. funding a conservator position, creating an archive and conservation fund;

  • Meeting current national standards in policy making and programming, e.g. administrative policy, procedures for siting, education and outreach, conservation and maintenance, new programs, increasing funding for community public art; and

  • Creating a new vision of public art in Edmonton to transform the urban environment and become an international leader, e.g. a Public ArtPark System and other programming.

  Recommended programs which have the most potential to impact the Green Network Strategy, if adopted, include extending the Percent for Art policy to private sector development; the ArtPark, a permanent system of arts and culture parks containing space for permanent and temporary public artworks and festivals; a mural art grant program for community groups and artists; legalized graffiti zones; short-term, experimental public art projects; and a biennial one-night exhibition of transitory public art projects.

» **City Policy C458C: Percent for Art to Provide and Encourage Art in Public Areas**, establishes the Percent for Art Program, which allocates 1% of the qualifying construction budget of any publicly accessible municipal development project (e.g. streetscape, parks, buildings, bridges) for the procurement of public art. The policy has a number of objectives:

  • Improve the livability and attractiveness of Edmonton.

  • Increase public awareness and appreciation of the arts.

  • Stimulate the growth of the arts and arts-related business.

  • Use public art to help meet urban design objectives of municipal developments.

  • Encourage public art in private developments through example.

  • Build a civic art collection.

  Approved public art must be displayed within or near publicly accessible municipal property, which may include parks, plazas, squares, and other open spaces. The Policy is administered by the Edmonton Arts Council.

Ribbon of Green Master Plan (1992)

The Ribbon of Green Master Plan provides valuable information about heritage resources in its summary of a 1980 biophysical study. The study developed an inventory of historical and prehistoric resource sites in the North Saskatchewan River Valley Ravine System. It found an extensive list of resources in the valley, and very few areas with "low potential" to contain historic resources. Especially high potential areas are river terraces and the top of bank, while the escarpment has moderate potential to contain resources. Resources might include agricultural sites, churches, cemeteries, coal mines, fur trading posts, historic Aboriginal camps, industrial sites, recreational or residential areas, bridges, railroads, or prehistoric sites. The Plan concludes that most low-impact recreational uses are compatible with preservation, but any modification of land surface (e.g. landscaping, trail construction, erosion control, clearing, construction) could disrupt a historic resource.

River Valley Alliance Plan of Action

Although discussed in more detail in the Biodiversity Brief, the Plan is relevant to planning for cultural and heritage resources in the open space network. The Plan establishes social, environmental and economic objectives for the entire river valley, including the expansion of education opportunities based on the park's natural and cultural history, and providing venues for cultural, arts and entertainment-related activities.

Edmonton Municipal Cemeteries Master Plan (2008)

Cemeteries are significant open spaces in the city, and perhaps among the most important in terms of memorializing significant persons in Edmonton history: pioneers, entrepreneurs, and City founders. Some cemeteries contain heritage markers or monuments, and others may be considered historic places in their own right. Cemeteries also function as sites for cultural expression and remembrance.

The Edmonton Municipal Cemeteries Master Plan provides a long-range plan for the development of cemetery open space that aligns with City priorities and community needs. One of the Plan's Guiding Principles is to "embrace our responsibility as custodians of assets and records of historical and heritage significance." The Plan includes three municipal "heritage" cemeteries, four other municipal cemeteries, three private cemeteries, and numerous religious cemeteries (some of which have heritage value).

The three Heritage cemeteries under City of Edmonton jurisdiction (Beechmount, Edmonton, Mount Pleasant) are generally fully developed, with limited infill potential. The Plan identifies capital requirements for monument restoration, maintenance, and enhanced facilities and benches, among other upgrades. These cemeteries have a high potential return on investment in development, since their constrained sales inventory leads to a premium price for remaining products.

Relevant Projects & Programs Underway

There are currently a number of projects and programs underway in Edmonton that directly address the cultural or historic significance of public open spaces. In the examples below, that significance is reflected in the use of open spaces for cultural expression in the form of public art or Indigenous ceremony and learning; and awareness of the historic uses and heritage values of parks and other public lands.

» **Queen Elizabeth Park**: As part of Phase 2 of the Master Plan implementation, the City of Edmonton and the Edmonton Arts Council are developing an Indigenous Art Park to permanently exhibit up to 6 artworks by Canadian Indigenous artists. Selected artists will be required to engage with Treaty No. 6 First Nations, Metis, and other Indigenous citizens in Edmonton to ensure that their artworks reflect the "story of the place", which includes significant historic use by Metis and First Nation peoples. The Master Plan also identifies space for additional public art elsewhere in the park, to be implemented in future phases.

» **The Kihciy Askiy (Sacred Earth) Development** is currently undergoing design for a permanent site for Indigenous cultural events and learning experiences in Whitemud Park. The development is intended to provide a natural setting to host Indigenous spiritual ceremonies, cultural camps, sweat lodges, and talking circles; grow medicinal herbs and practice traditional crafts; and facilitate intergenerational and intercultural learning.

» **Beaver Hills House Park** recently solicited public participation to contribute to the design for a permanent mural located in the Alley of Light. The design involves 146 bird silhouettes that have been silk-screened using participants' textile drawings and colouring, and text in both English and Cree. Indigenous participation, including the design of Metis artist Destiny Swiderski, is especially important in reflecting the historic importance of the namesake Beaver Hills, east of Edmonton, to the Cree Nation.

» **Edmonton Maps Heritage** is a project of the Edmonton Heritage Council, in partnership with the Edmonton Historic Board and the City of Edmonton Archives, which seeks to map various aspects of the city's heritage. The online resource aims to connect people with information on important heritage sites, and anticipates public involvement in adding more content over time.

» **Art & Design in Public Places (aka The Places)** is a community based, multi-partner initiative led by the Downtown Business Association to help revitalize downtown through public art and design installations. To date, 63 temporary and permanent works of art have been developed.

» **Percent for Art (City Policy C458C)** results in an ongoing series of public art projects in Edmonton's open spaces as funding is obtained from developers. Recently, a competition was held for the public art to be placed in the ICE District, a mixed-use development under construction adjacent to the Rogers arena. The pieces selected include two outdoor sculptures (Skater's Arch and Essential Tree), an abstract artwork (Figures in Motion) above the entrance to the community skating rink, and a 14-metre diameter mosaic (Iron Foot Place) set into the floor of the Winter Garden, the primary plaza and entrance to Rogers Place.

Relevant Funding Streams & Mechanisms

The following funding sources provide opportunities for organizations and projects related to heritage conservation or interpretation, public art, cultural or intercultural initiatives, and capacity building for arts- or heritage-oriented community groups. Such funding could be applied to projects, installations, infrastructure or activities that take place within public open spaces.

Federal Funding Sources

» **Infrastructure Canada: The Federal Gas Tax Fund** provides funding for a wide range of local infrastructure projects, including: public transit, wastewater infrastructure, drinking water, solid waste management, community energy systems, local roads and bridges, capacity building, highways, local and regional airports, short-line rail, short-sea shipping, disaster mitigation, broadband and connectivity, brownfield redevelopment, culture, tourism, sport, and recreation.

» **Building Communities Through Arts and Heritage Program** provides funding for local festivals, community anniversaries, and a Legacy Fund for commemorative capital projects.

1. TIPI

The Kihciy Askiy development is planned to include an area for tipis, similar to this one in Writing-on-Stone Provincial Park.

Source: Alberta Parks via Flickr.com
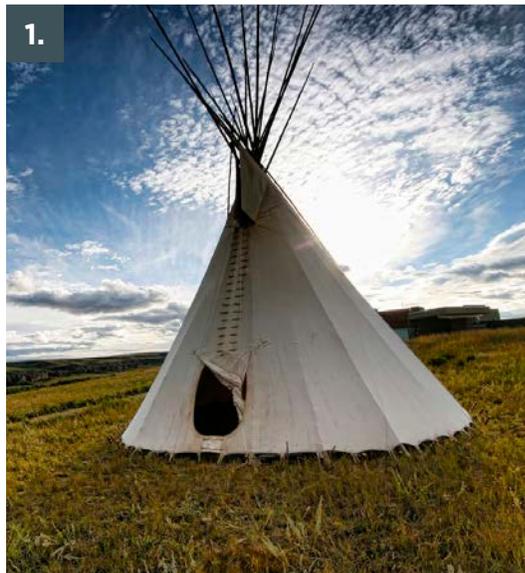
2. VAULTED WILLOW

Sculpture by Marc Fornes of THEVERYMANY in Borden Park.

Source: Doyle C. Marko via edmontonpublicart.com

Provincial Funding Sources

» **Community Initiatives Program (CIP)** supports project-based initiatives in areas such as community services, seniors' services, libraries, arts and culture, sports, education, and health and recreation. Maximum grant is $75,000 per project per year; funding is approved on a matching grant (met by financial contribution, volunteer labours, services, or donated materials or equipment) basis.

» **Heritage Preservation Partnership Program** provides financial assistance to initiatives that preserve and interpret Alberta's heritage through conservation, heritage awareness, publications, research grants, and scholarships. The program includes the following grant streams:

  - Heritage Awareness Grant

  - Historic Resource Conservation Grant

  - Transportation / Industrial Artifact Conservation Grant

» **Grant Program for the Conservation of Flood Impacted Historic Resources** assists with the conservation of Provincial and municipal Historic Resources that were impacted by the June 2013 flood.

City of Edmonton Funding

» **City of Edmonton Community Investment Operating Grant program** provides operating assistance to Edmonton non-profit organizations whose activities benefit citizens of Edmonton with regards to social services, intercultural relations, or recreation/sport/leisure, including athletic, physical, historical, natural science, cultural, social and intellectual activities.

» **Edmonton Community Foundation Community Grants** provides funding for a wide range of projects and programs that meet a need in the community, strengthen organizational capacity, and promote collaboration and sharing among agencies to reduce duplication of programs or improve effectiveness of services. These include seed grants for new projects, programs or initiatives; equipment grants (including repairs or renovation), project/program grants, and operating grants.

» **City of Edmonton Community Mural Matching Grants** are provided through the Capital City Clean Up program to help community groups develop murals on private or public structures in order to deter graffiti.

Other Funding Sources

» **Edmonton Arts Council Community Arts Program** provides funding for projects that are collaborative projects between professional artists and a distinct community, including community art.

» **Edmonton Arts Council Community Investment Program** provides funding to arts and festival organizations in the City of Edmonton from the municipal tax base. Relevant grant streams include:

  - Celebrations Grant

  - Festival Seed Grant and Festival Operating Grant

  - Arts Operating Grant

» **Edmonton Heritage Council Community Investment Program** invests funds, provided by the City of Edmonton, into the stabilization, increased professionalism and innovation of heritage in Edmonton. Relevant grant streams include:

  - Project Funding: provides assistance for a heritage project carried out by a non-profit heritage or community organization

  - Living Local Grants: provides support to a project involving a community league, artist, and heritage practitioner, who develop meaning at a local level

A number of private charitable organizations provide funding for arts projects in particular:

» The McLean Foundation Grants (conservation and arts projects)

» Hylcan Foundation Grants (arts projects)

» Royal Bank of Canada Charitable Foundation (civic, arts and culture projects)

Best Practices & Trends

The following trends challenge planners to think about "heritage" beyond the confines of a historic building, and "art" beyond the confines of a gallery. They represent significant areas of focus for historic preservation and cultural awareness both locally and internationally, and bear direct relation to Edmonton's own cultural landscapes (e.g. relics of former mining operations in the North Saskatchewan River Valley) and public art aspirations (e.g. Percent for Art Policy).

3. STREAM OF DREAMS

Stream of Dreams is a nationwide water education program that started in Burnaby, BC in 1998. Educators visit local schools where students paint wooden fish, which are typically installed on their school yard fence.

Source: haltonrecycles. wordpress.com

4. GARDEN AT DUISBURG-NORD

The Duisburg-Nord Industrial Landscape Park features a variety of landscapes, from gardens to reclaimed settling ponds, that pay homage to the region's industrial past.

Source: Mark Wohlrab via germany.travel
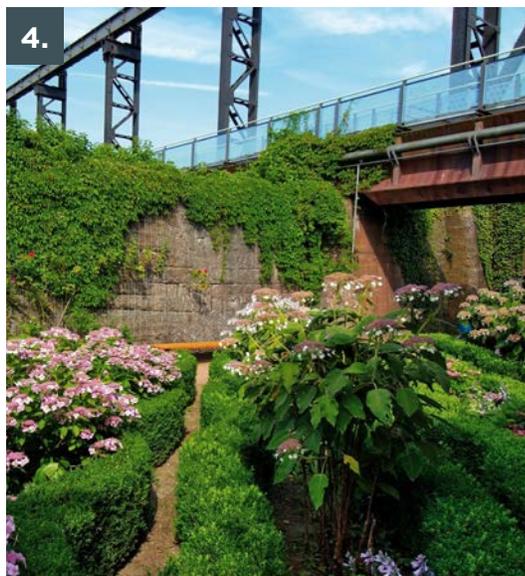
Protecting Cultural Landscapes

The great majority of heritage literature (and in fact, the majority of plans and policy) focus on buildings or other structures with some cultural or historical significance. However, cultural landscapes – a geographic area that demonstrates the evolving relationship between natural and human forces – are equally important for understanding our origins and development in tandem with our environment. **Preservation Brief 36: Planning, Treatment and Management of Historic Landscapes,** published by US National Park Service Technical Preservation Services, provides background information and best practices for protecting historic designed (i.e. intentionally landscaped) and vernacular (i.e. functional landscapes shaped by culture or lifestyle) landscapes. (Historic sites and ethnographic landscapes are not included in the brief.) In general, the Brief recommends the following steps prior to undertaking work on the landscape:

» Historical research

» Inventory and documentation of existing conditions

» Site analysis and evaluation of integrity and significance

» Developing an approach plan (i.e. preservation, rehabilitation, restoration, reconstruction) and treatment plan (including interpretation)

» Developing a cultural landscape management and implementation plan

» Developing a strategy for ongoing maintenance

» Preparing a record of treatment and future research recommendations

Community Art

Public art is not necessarily the product of a lone artistic expert working on commission. Instead, many open spaces are appropriate for expressions of community art, which are products of shared, collaborative, creative experiences among members of a community (defined by ethnicity, geography, age, traditions, etc.) and professional artists. Involving the community in creating their own public realm strengthens engagement, promotes awareness of the arts, and

encourages artistic skill and creativity. Additionally, the product can more accurately reflect the history, culture, and aspirations of the community itself, which further supports community ownership and pride.

Industrial Landscape Preservation

With the decline of manufacturing and heavy industry in many developed countries, many cultural and historical landscapes are industrial in nature: abandoned mines or quarries, derelict furnaces and settling ponds, open spaces littered with disused equipment or trade infrastructure. Starting with the protection of linear heritage resources like canals, railways and historic roads, preservationists are increasingly becoming aware of the value of protecting landscapes that reveal humans' working past, and the relationship between industry and the natural environment. Significant industrial open spaces have been established as parks, whether or not they are protected by formal designation, which often have associated interpretive elements to highlight local history and culture. Several prominent examples are found in the deindustrializing Ruhr Valley in Germany, including the Duisburg-Nord Industrial Landscape Park (a former coal and steel production plant), and in the American "rust belt".

Precedents

The following precedents represent world-leading examples of the use of public open spaces as catalysts for cultural education (through the creation of an open air public art museum); and as places for heritage awareness and celebration (through the preservation of historic resources and cultural landscapes, including distinctive fauna).

The Vancouver Biennale | Vancouver, BC

The Vancouver Biennale, aka the Vancouver International Sculpture Biennale, was established in 1998 in collaboration with the Vancouver Parks Board. The Biennale creates an open air museum exhibition every two years featuring world-class international sculptures, new media and performance art. The objective of the Biennale is to celebrate great art in public spaces, creating a catalyst for learning, community engagement, dialogue, and social action. The mission of the organization is to make public art accessible, engaging, and motivating to create vibrant and inspired communities. Education is a priority mandate of the Biennale; outreach to local communities includes an artist in residence program, professional symposium and public lecture series. The Biennale education program extends its reach to the global audience through an online learning resource centre, international media coverage and publications.


5.

Phoenix Park | Dublin, Ireland

Found in Dublin, Phoenix Park is one of Europe's largest urban green spaces. The park incorporates several cultural and historical features, including historic and religious monuments, and a historic fort. Expansive lawns and woodlands provide habitat for the deer that were introduced to the park several centuries ago. The park also hosts concerts, a local cricket club, and the Dublin Zoo.

6, 7, 8. SCENES AT PHOENIX PARK.

This park showcases several heritage elements: herds of fallow deer descended from the park's history as a royal hunting grounds; Neolithic and Viking burial sites; and historic structures dating from the 15th century.

Sources: Greg Clarke via Flickr.com (6), Damien Slattery vai Wikipedia (7), doyler79 via Wikipedia (8)
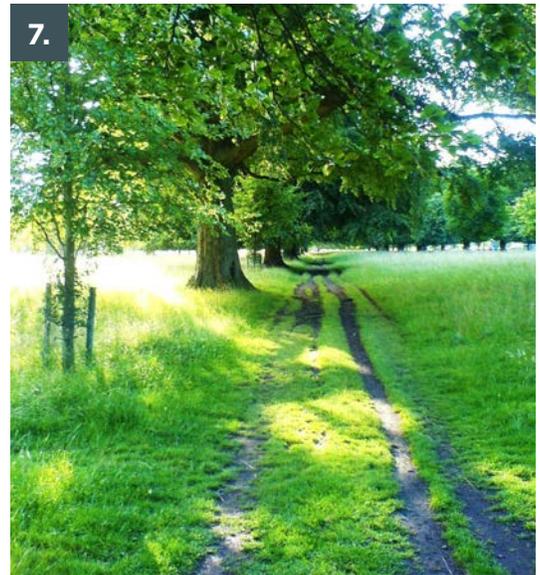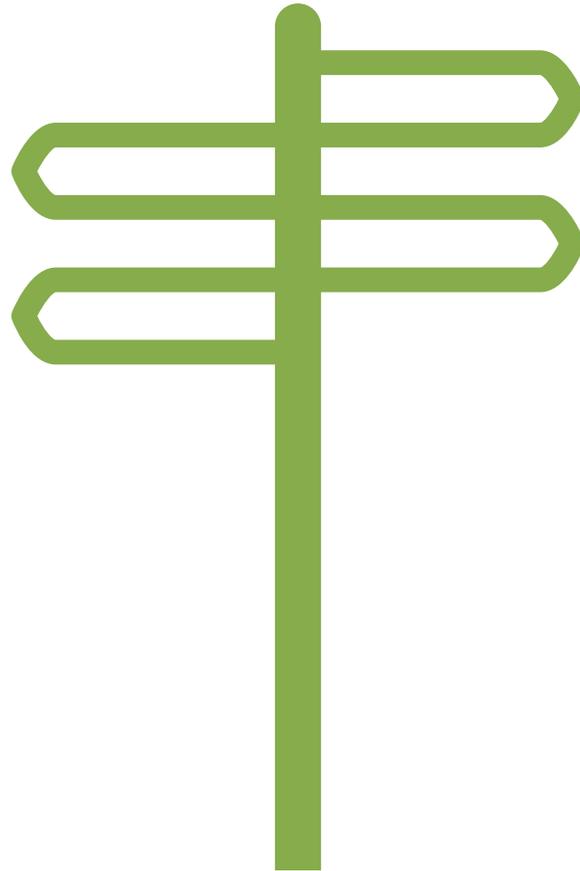
Destination & Tourism

Open spaces not only serve as gathering spaces for a neighbourhood or community, but can also function as a destination, a draw for the larger area whether the region, province, or nation.

Key External Stakeholders / Organizations

In some ways, all the stakeholders who help to make open spaces great for residents – through their attention to aesthetic, historic, cultural, environmental, and community-building values – also make them great for visitors. Nevertheless, the following stakeholders are involved either directly in tourism and place promotion (which may explicitly involve parks and gardens), or indirectly in organizing and promoting events that take place within open spaces: sport tournaments, festivals, competitions, and any other event that attracts visitors from outside Edmonton.

EXTERNAL STAKEHOLDERS / ORGANIZATIONS

This list is a comprehensive, though not exhaustive, list of organizations that are active in protecting, promoting, celebrating, and raising awareness of the city`s cultural and historical legacy; the city`s heritage.

Alberta Culture and Tourism

Alberta Environment and Parks

Alberta Hotel and Lodging Association

Alberta Recreation and Parks Association

Business Revitalization Zones (BRZs)

Communities in Bloom

Creative City Network of Canada

Destination Canada

Edmonton Arts Council

Edmonton Chamber of Commerce

Edmonton Dragon Boat Festival Association

Edmonton Economic Development Corporation

Edmonton Federation of Community Leagues

Edmonton Sport Council

Make Something Edmonton

Parks Canada

Retail, entertainment and hospitality industry

Valley Zoo Development Society

Relevant Plans & Policies

Open spaces can serve as a destination for local and regional visitors, and a tourist attraction for visitors from other provinces or countries. Parks and other open spaces can provide iconic landscapes by virtue of their history, landscape design, attractions, natural features, gardens, or something more intangible. Open spaces are home to arenas, stadiums, golf courses and other major recreational facilities, and museums and other attractions are often co-located with parks or plazas. Open spaces can provide venues for events, such as markets, public art exhibitions, festivals, and sporting events, that help to attract locals and visitors. Finally, open spaces are often home to landmarks, whether natural or anthropological, that may themselves provide a draw for tourists.

Open spaces are clearly an important aspect of branding and tourism for Edmonton. Images of open spaces figure prominently on virtually every page of **Explore Edmonton**, the official tourism website for the city: street performers in city plazas or squares, crowds enjoying an outdoor music festival, canoeing on a river, outdoor ice skating, and snow sculptures in a park. The portal suggests visiting the John Janzen Nature Centre, the Muttart Conservatory, Fort Edmonton Park, Hawrelak Park, and the North Saskatchewan River Valley, in addition to park-related activities like cross-country skiing, snowshoeing, shinny, canoeing, tobogganing, ice skating, and fishing. Also recommended are festivals, farmers' markets, and other activities that are hosted within open spaces. Similar places and activities are featured on the **Visit Alberta** website, which boasts that "twenty-two major parks make up Edmonton's ribbon of green stretching along the North Saskatchewan River – the largest expanse of urban parkland in North America."

Pathway to Growth: Alberta's Tourism Framework 2013-2020

A Pathway to Growth suggests the importance of natural and recreational features in growing tourism in the province. Public open spaces often provide the physical venue for the "products" that contribute to Alberta tourism: camping, agricultural tourism, event tourism, culture and heritage

tourism, special attractions, summer and winter outdoor recreation/adventure tourism, Aboriginal culture-based activities, and trails. One of the key drivers of the Framework is development and investment to expand the supply of tourism products/experiences, such as expanded National and Provincial Parks, new sustainable experiences near water or significant natural attractors, and enhanced access to Crown lands with high tourism and recreational potential. The plan suggests collaborating with other tourism and marketing agencies to align branding and key messages at the regional, community and local levels. However, most of its policies are oriented toward provincial resources, with little bearing on municipal open space planning.

A number of Edmonton plans are particularly relevant to the destination or tourism potential of public open spaces. Some of these (e.g. Edmonton Public Art MAP, fresh: Food and Urban Agriculture Strategy, Edmonton Historic Resource Management Plan) have been discussed elsewhere, while others are summarized below.

The Way We Prosper: A New Direction for Economic Development (2013)

City of Edmonton policy positions its open spaces not only as destinations for tourists, but as an important element in creating the quality of life that makes the city itself a destination for living and working. The Way We Prosper acknowledges the value of people and place in building a resilient local economy. In particular, place making is emphasized as an essential tool for building the quality of life experience that attracts a young, educated, highly-mobile work force. Open spaces figure prominently in plans to enhance recreation amenities, natural heritage features, and cultural assets to support quality of life. Other factors that are important for making Edmonton a destination include promoting the city as a cultural and festival centre, adding vibrancy to downtown, and strengthening neighbourhoods to attract private-sector investment. Overall, the Plan provides policies that enable marketing and branding of a livable, sustainable city to the world. Open spaces are an important part of making welcoming, vibrant communities and providing space for recreation and entertainment.

For the Love of Winter: Edmonton's Winter City Strategy

Some aspects of **For the Love of Winter: Edmonton's Winter City Strategy** and its supporting **Implementation Plan** and **Winter Design Guidelines** are discussed in other briefs (see the Aesthetic Value and Community Building Briefs), but the plans also include some specific guidance in order to make Edmonton an attractive place for visitors – and the design and programming of its open spaces is integral to that development. The overall goal of the plans is to make Edmonton "a world renowned northern city" that can market its winter livability to visitors (and potential future residents) around the world.

Countless goals can impact on the destination appeal of public open spaces, including the promotion of outdoor programming and activities, making destinations easier to access in winter conditions, designing a comfortable and beautiful public realm, and supporting festival and patio culture year-round. However, Goal 9 explicitly calls for the City to "promote Edmonton's Great Northern Story locally, nationally and internationally." The action items that are intended to support this goal are as follows:

» Develop a winter brand for Edmonton aimed at invigorating Edmontonians. It should speak to our city's extremes: light and dark, hot and cold, wild and cozy, and should play up on our classic, Edmonton self-deprecating humour.

» Launch a marketing campaign for Edmontonians and by Edmontonians that focuses on our humour, resilience and pride in being a great northern city, and busts the myths around ugly winter clothing.

» Incorporate images and video of Edmonton in winter into City of Edmonton marketing materials, reports, publications and other materials.

» Work collaboratively with Edmonton Tourism, regional tourism partners and Travel Alberta to develop an Edmonton Arts/Culture/Recreation "Winter Product" package.

» Encourage allocating a portion of the existing Destination Marketing Fee to support winter partnerships and tourism initiatives.

Edmonton Valley Zoo Master Plan Update (2005)

Celebrating Wild Adaptations in a World of Extremes defines visitor experiences and physical planning for one of the primary tourist attractions in Edmonton. The Plan attempts to "build visitation, and sustainably develop the facilities and living assets in ways that underscore the core belief in conservation and commitment to education." With respect to open spaces, landscapes should mesh with the experience of a park setting, and avoid architectural solutions that evoke an urban context. The Zoo should encourage not only a zoological visitor experience, but also a botanical one where plant ecology is celebrated. Additional physical planning principles include the provision of spaces for parallel interpretive play throughout the zoo, infrastructure for rest and relaxation, and shelter for group gathering and respite from the elements. All space within the zoo is organized into "precincts" that divide the animal exhibits thematically, and that cluster visitor and educational services near the entry.

Fort Edmonton Park Master Plan Update (2010)

Fort Edmonton Park is an attraction located within the River Valley which uses buildings, streetscapes, artifacts and programs to re-create life in historic Edmonton. The Master Plan provides direction regarding capital development, animation and related activities. The update places an increased emphasis on "bringing history to life" by positioning the Park as a year-round space for evening events and seasonal recreation, and animating the streets with a daily parade, among other recommendations. The Plan also envisions an enhanced connection to the North Saskatchewan River, an interpretive Frontier Path through the forest, and upgraded open spaces for sporting re-creations and camps.

Tourism-Oriented Activities

Some policies and regulations influence the use of public spaces for tourism-oriented activities. Together with City procedures, these regulations require that applicants wishing to use public open space for vending, food or alcohol service, or special events follow applicable legislation and acquire necessary permissions. Briefly, these may include:

» Alberta Health Services, Environmental Public Health branch (under Alberta Food Regulation AR 31/2006 and Alberta Nuisance and General Sanitation Regulation AR 243/2003):

- Special Event Organizer Notification form

- Special Event Food Vendor Notification form

- Permission to Use an Approved Food Establishment form

» Alberta Liquor and Gaming Commission (under Alberta Gaming and Liquor Regulation AR 143/1996): Liquor Special Event License

» Alberta Safety Codes Council (under the Alberta Safety Codes Act, Revised Statutes 2000): Certification of Inspection form (gas/plumbing, ventilation, electrical, fire)

» City of Edmonton (under Traffic Bylaw 5590, Community Standards Bylaw 14600, Parkland Bylaw 2202, Public Places Bylaw 14614, and Zoning Bylaw 12800):

- Business License

- Special Event Permit

- Vending Permit, or Event and Festival (Umbrella) Vendor Permit

- Noise Bylaw Exemption Waiver

- Road Permit

- Traffic Accommodation Plan

- Fire Safety Inspection and Fire Safety Plan

- Development Permit and Building Permit (structures > 10 m2 or higher than 3.7 m that are installed for longer than 24 hours)

Some other guidance with regards to festivals, events or entertainment in open spaces include:

» City of Edmonton Street Vending Location Guidelines

» City of Edmonton Vending Guidelines

» Responsible Hospitality Edmonton Good Neighbour Guidelines for Street Entertainment

Turning Design Upside Down: Civic Precinct Master Plan (2013)

The Civic Precinct Master Plan does not directly address how open spaces can promote tourism in Edmonton, but it certainly does promote the public realm as a space for celebration, activity, and civic identity. The Plan provides design guidelines and development planning for important civic open spaces, including Centennial Plaza, City Hall Plaza, and Churchill Square. It also envisions a Ceremonial Spine and "Cultural Carpet" within the precinct, and makes recommendations for the (re)location and layout of public art and festivals in different public open spaces.

Relevant Projects & Programs Underway

Numerous parks and open space projects are designed to upgrade their amenities or condition, which should make them more attractive destinations for locals and visitors alike. The following projects are more specifically oriented to visitors.

» **Edmonton festivals** animate public spaces and attract thousands of visitors per year.

» **Nature's Wild Backyard at the Edmonton Valley Zoo** is planned to rehabilitate the original Storyland Zoo infrastructure to create an immersive, child-focused educational experience. The redesign will create four zones where visitors can explore the ecology and habits of animals under, on, between and above the surface. Habitats are designed to be naturalized educational areas that promote closer interaction with the animals and provide play and educational activities. The project also intends to upgrade existing guest amenities that have reached the end of their lifespan. The project is currently in the design phase, with construction planned to begin in 2017.

» **Public Plaza at the Ice District**. As part of the Ice District, the area surrounding the new Rogers Arena that is intended to incorporate a variety of mixed uses (e.g. hotel, dining, shopping, casino and event space), a 50,000 square foot public plaza is envisioned as a "vibrant gathering place" that can host year-round events and programming, such as concerts, festivals, and ice skating.

Relevant Funding Streams & Mechanisms

Although the following funding sources do not explicitly direct grants toward tourism or marketing activities (with the exception of the Federal Gas Tax Fund), they do permit applications for a wide variety programs and projects that could be used to attract visitors to open spaces, including festivals, public art, sports, or infrastructure improvements.

» **Infrastructure Canada: The Federal Gas Tax Fund** provides funding for a wide range of local infrastructure projects, including: public transit, wastewater infrastructure, drinking water, solid waste management, community energy systems, local roads and bridges, capacity building, highways, local and regional airports, short-line rail, short-sea shipping, disaster mitigation, broadband and connectivity, brownfield redevelopment, culture, tourism, sport, and recreation.

» **Alberta Community Initiatives Program (CIP)** supports project-based initiatives in areas such as community services, seniors' services, libraries, arts and culture, sports, education, and health and recreation. Maximum grant is $75,000 per project per year; funding is approved on a matching grant (met by financial contribution, volunteer labours, services, or donated materials or equipment) basis.

» **The Edmonton Arts Council Community Investment Program** provides funding to arts and festival organizations in the City of Edmonton from the municipal tax base. The Program supports the following relevant grants:

  • Festival Operating Grant
  • Festival Seed Grant
  • Celebrations Grant

» **Edmonton Community Foundation Community Grants** provides funding for a wide range of projects and programs that meet a need in the community, strengthen organizational capacity, and promote collaboration and sharing among agencies to reduce duplication of programs or improve effectiveness of services. These include seed grants for new projects, programs or initiatives; equipment grants (including repairs or renovation), project/program grants, and operating grants.

Best Practices & Trends

There are numerous "best practices" that Edmonton could draw from in order to promote its parks and open spaces as destinations for regional, national, or international visitors. The **City Parks Forum Briefing Paper 09: How Cities Use Parks to Promote Tourism**, published through the American Planning Association, provides the following insights:

» Parks are sites for special events and festivals that attract tourists. Parks are ideal locations for large-scale events and festivals because they are often centrally located and can accommodate temporary infrastructure without major disruption of their normal functions.

1. EDMONTON FESTIVALS

Edmonton's public open spaces are well-used for special events and festivals, which can be major attractions for visitors from the city, the region and beyond.

Source: City of Edmonton

1.

» Parks provide sites for sport tournaments, which can be major sources of economic benefits. Even events such as regional sport tournaments can create a significant economic impact, especially when the tournament requires overnight accommodation and encourages expenditure on complementary activities or dining. In most cases, sport tournaments will generate a greater economic impact for local communities than special events and festivals, because the latter (unless it can be classified as a "mega-event") is likely to attract a high proportion of attendance from locals.

» Larger urban parks with landmarks and attractions (e.g. zoos, memorials, museums, cultural and heritage artifacts, and historical sites) can attract tourists. This finding is based on the principle of cumulative attraction, whereby clusters of amenities develop a "critical mass" of attraction, resulting in higher visitation than if the amenities were widely scattered. The mix of uses within these parks might range from botanical gardens and nature trails to athletic fields and beaches, not to mention complementary attractions like planetariums, aquariums, or carousels.

» Parks with landscape planting and design that are recognized as "living works of art" can be tourist attractions. The parks highlighted in the brief feature famous designers (Frederick Law Olmsted and Calvert Vaux, Daniel Burnham), distinctive landscape designs (winding paths, geometric shapes), a variety of planned and natural landscapes, manicured gardens, lawns, trees, monuments or public art, and water features.

Precedents

The following precedents represent some of the most popular and well-visited public open spaces in the world. They were selected not because Edmonton should necessarily aspire to create spaces as monumental as Trafalgar Square, or as unusual as "the Bean", but rather because they demonstrate how a combination of features (e.g. monuments and heritage, events and festivals, natural and landscaped environment, gardens and gathering spaces) can be leveraged to create places that are sufficiently interesting, attractive, unique and welcoming to develop a distinctive reputation beyond municipal borders.

Trafalgar Square | London, UK

Trafalgar Square is a good example of a public open space whose combination of history and design attracts both locals and tourists. The large, centrally-located city square has been a historic landmark since the 13th century, and currently commemorates Lord Horatio Nelson's victory against Napoleon's navy at the Battle of Trafalgar in 1805. A monumental central column, crowned with a statue of Nelson, is surrounded by oversized statues of four lions, and large, brightly-lit fountains. At the very core of London, Trafalgar Square is frequently used for community gatherings, Christmas and New Year's Eve celebrations, political demonstrations, and festivals.

Stanley Park | Vancouver, BC

Stanley Park is a large urban park whose amenities and scenery attract nearly 8 million people per year. The park features trails through the temperate rainforest, a Sea Wall around its perimeter that connects with paths in downtown Vancouver, landscaped gardens and fields, and scenic waterfront views. Also located within the park are an aquarium, a miniature train (whose surroundings are seasonally programmed with festive lighting), and a historic outdoor amphitheater.

Millennium Park | Chicago, Illinois

Millennium Park was first planned in 1997 as a means to create new park space in Grant Park by revitalizing disused railroad tracks and parking lots on the Chicago riverfront. Completed in 2004, the park is now a year-round attraction for locals and visitors. Its situation makes it a prime destination for viewing the iconic Chicago skyline and connecting to the riverfront pathway. Other park features include a reflecting pool, seasonal ice rink, the Lurie Garden, and monumental public art (e.g. Cloud Gate, aka "the Bean"). The park also contains the Jay Pritzker Pavilion, which was designed by Frank Gehry as the most sophisticated outdoor concert venue of its kind in the United States. The park attracts around 5 million visitors per year.

2. TRAFALGAR SQUARE

This square is the central meeting place in London, as well as the stage for many social, cultural, historical, and political events and programs over the years.

Source: diliff via Wikipedia

3. STANLEY PARK

The central and largest park in Vancouver, this park provides both recreation space, as well as serving as a meeting point and destination for both residents and tourists.

Source: GoToVan via Flickr.com

4. CLOUD GATE AKA 'THE BEAN'

This now iconic sculpture has become the centrepiece of Millienium Park and a destination all on its own for visitors across the country, and around the world.

Source: Vincent Desjardins via Flickr.com

breathe