wintercity Edmonton

Winter Design Guidelines

Transforming Edmonton into a Great Winter City

Edmonton

Foreword

By virtue of their locations, northern cities possess specific regional characteristics. They ought to impress themselves onto our senses as belonging to and springing from the north, not just from anywhere. Importing urban forms from southern climatic zones is inadvisable since their architectural grammar is unsuitable in conditions that include frost, ice, snow, wind, darkness and prolonged cold temperatures. To ignore winter's presence is both unreasonable and irresponsible. Winter hardships must be explicitly acknowledged in architecture, planning, development policy, and urban design so that built environments can function more effectively—reducing the negative impact of winter while enhancing its positive attributes.

Whether a city is viewed as safe, comfortable, desirable and aesthetically pleasing can impact significantly on its ability to attract people, to safeguard economic vitality and to instill civic pride. In winter cities, it is essential to build in a way which provides thermal comfort especially in outdoor public and semi-public space. Careful microclimactic planning is critical to counteract people's tendency to hibernate. We should not have to struggle against climate. Instead, we must form alliances with it.

Edmonton possesses approximately 150 outdoor-comfort days (the number of days between 9°C in spring and 11°C in autumn), from early May to mid-October. But urban spaces designed to catch the sun, block the wind and reduce shadows from tall buildings can extend this time by up to 30%, meaning people can be outside in comfort up to four weeks earlier in spring and three to four weeks later in fall.

Edmonton's newly formulated Winter Design Guidelines are a strategic tool for providing developers, architects, engineers and planners with a framework for their projects, identifying the City's intentions in terms of what kinds of development and what levels of quality it deems acceptable.

These Guidelines are a welcome and needed addition to existing knowledge. They will find eager users as northern places seek to turn winter to advantage, while encouraging attractive living and working environments, enhancing community pride and providing incentives to attract new business investment. They will spur design excellence in all seasons and clarify the city's preferences regarding future development. It is the intention to integrate them into existing land-use policies, zoning by-laws, official plans, approval mechanisms and other regulations requiring coordination between public and private sectors. With more than 150 superb illustrations and photos, this landmark document offers practical advice as well as inspiration. Based on the most up-to-date information and currently accepted planning practices, the Guidelines will become an indispensable reference for other communities.

Edmonton will be in the forefront of leading international practices once the Guidelines are applied. They shall improve the ways in which decisions are taken, aiming at the highest possible urban quality while creating thermal comfort and enjoyment for the city's residents. I believe that these Guidelines for transforming the city into a model for other cold regions provide the most comprehensive analyses and insightful prescriptions presently available. They will undeniably change the way we view and plan our cities.

Norman Pressman

Founding President of the Winter Cities Association
Professor Emeritus, Urban Design & Planning
University of Waterloo

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Introduction

WINTER CITY

A concept for communities in northern latitudes that encourages them to plan their transportation systems, buildings, and recreation projects around the idea of using their infrastructure during all four seasons, rather than just two seasons (summer and autumn).

- The Way We Grow: Edmonton's Municipal Development Plan

FACTS ABOUT EDMONTON WINTERS

WINTER LENS

A winter lens is simply a way of seeing developments and designs from a winter perspective. If a streetscape, open space or amenity is designed with winter in mind, it will be comfortable in all seasons. Winter should be considered at the beginning of the design process, not treated as an after-thought at the end.

1.1 Designing for Winter

Winter is a core part of Edmonton's identity and needs to be fully considered as our city grows. Northern urban design fully considers the winter context, making the most of opportunities to stay outdoors by capturing the sun's warmth, providing protection from the wind, and making the city more accessible, safe and enjoyable year-round. Thanks to the extensive community consultation undertaken for the development of the WinterCity Strategy, the conversations around how Edmonton embraces winter are changing. The development of winter design guidelines is foundational to making Edmonton a great winter city.

The winter design guidelines provide flexible guidance and inspiration for future development decisions throughout Edmonton. The guidelines are intended to facilitate leading-practice urban design solutions with a winter lens to transform Edmonton into a great year-round city. They establish key outcomes, rationale and design guidelines for the physical components of the private and public realms that support a positive quality of life for Edmontonians.

Attention to cold climate design can yield greater levels of comfort and accessibility throughout the year and effectively extend the outdoor season by six weeks each year (Pressman, 2005). With a winter lens, we can start designing our communities with celebration rather than hibernation in mind.

WINTER IN EDMONTON, NORTH AMERICA'S NORTHERNMOST LARGE CITY

Our winter, or cold season, typically lasts from November to March, though it varies greatly in length and severity. Most Edmontonians consider the months of October and April to be part of the shoulder seasons. Winters in Edmonton are less severe than in many other Canadian cities, with low humidity and less snow. Although the winter temperature can dip to -40°C, the cold spells last only a few days. Of the 154 days between the start of November until the end of March, 121 are sun-filled. Year-round, Edmonton is actually the second sunniest city in Canada!

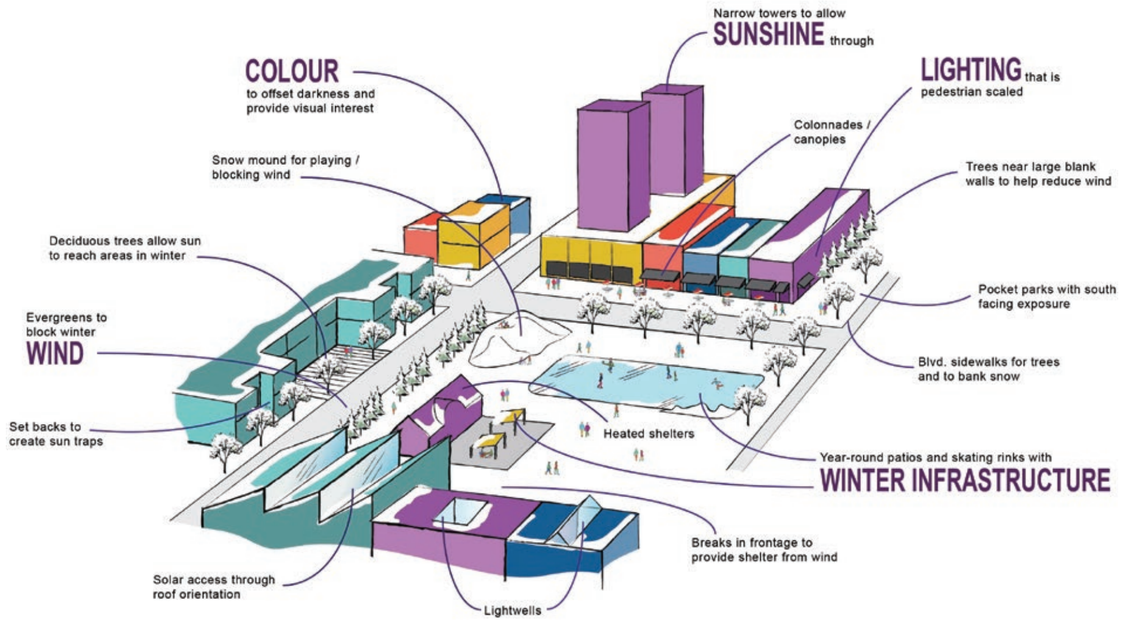
1.1.1 Winter Design in a Nutshell

The Winter Design Guidelines are comprehensive. For the sake of simplicity, however, the following five main principles of design can be considered.

1. Incorporate design strategies to block wind, particularly prevailing winds and downdrafts.
2. Maximize exposure to sunshine through orientation and design.
3. Use colour to enliven the winterscape.
4. Create visual interest with light, while being mindful of density, spread and colour.
5. Design and provide infrastructure that supports desired winter life and improves comfort in cold weather.

The five main principles are applied in all contexts throughout these guidelines. Multiple examples are provided for how to apply the principles in all scales, from building to site to neighbourhood. The following image demonstrates how all five principles can be used in one space.

PRINCIPLES OF WINTER DESIGN



1.2 Investing in Our City

The business case for designing for winter lies in improved economic and social outcomes for our city, year-round. These results will be realized through leveraging the winter assets we already have, and by applying a winter lens to future investments in Edmonton.

Collectively, we are spending billions of dollars in our city on new construction. In order to get the highest return on this investment, we need to ensure that the winter season is fully taken into consideration. Our developing urban fabric needs to support a vibrant outdoor winter life. Winter is our dominant season, and there are many opportunities to design better for it.

A livable and sustainable city requires the integration of compact development, transportation infrastructure, and high-quality public and private realm amenities. These urban design elements are particularly important in a winter city, where people shy away from extended exposure to the outdoors on extremely cold days. While access and mobility for all transportation modes are necessary to allow people and goods to move efficiently through the city, the movement of goods and single-occupant vehicles are sufficiently accommodated in Edmonton.

With a focus on improving outdoor experiences in winter, these guidelines promote, support and champion pedestrian and transit-oriented development, as well as active winter living. Investing in the quality of Edmonton's public realm, including the transportation network, and our green and white spaces, is essential for encouraging private sector investment, as well as improving our image as a place to live and work.

WINTER IS AN ASSET OFFERING GREAT SOCIAL AND ECONOMIC VALUE TO OUR CITY

Innovative northern urban design transforms the challenges of the season into opportunities that work with our climate.

"We need to focus on urban design that takes advantage of all that winter offers, embrace the opportunity of its activities and create a city that flourishes through the unique beauty of our northern landscape."

- Councillor Ben Henderson, Ward 8, City of Edmonton, and WinterCity Advisory Council Co-Chair 8, City of Edmonton, and WinterCity Advisory Council Co-Chair

The Ice District under construction in downtown Edmonton

1.3 For the Love of Winter: Edmonton's WinterCity Strategy

In October 2012, the City of Edmonton became a leader on the winter city world stage as Edmonton City Council endorsed *For the Love of Winter: Strategy for Transforming Edmonton into a World-Leading Winter City*.

In doing so, Council formally supported a vision both shared by many Edmontonians and admired by those living in northern cities around the world. That vision is a city that celebrates and makes the best of winter, no longer viewing it as a time to shut things down and stay inside.

Winter is an asset offering great social and economic value to our city. Streets and public gathering places designed to capture sunlight and block the wind, walkways that are easy to navigate, and playful lighting illuminating our long winter nights, all make it easier and more enjoyable to stay outside. With more people outside on the streets, the city feels more alive and attractive; a place both locals and tourists want to be part of and experience.

The WinterCity Strategy implementation plan was approved in September 2013.

Both the WinterCity Strategy vision document, For the Love of Winter (should this be here? It's not the full title), and the implementation plan can be found online at: ***www.edmonton.ca/wintercitystrategy***.

For the Love of Winter Strategy document cover

STRATEGY GOALS

The WinterCity Strategy was developed around the following ten goals, which fall under four pillars:

Winter Life

Goal L1:
Make It Easier to 'Go Play Outside': Provide More Opportunities for Outdoor Activity

Goal L2:
Improve Winter Transportation for Pedestrians, Cyclists and Public Transit Users

Winter Design

Goal D1:
Incorporate Urban Design Elements for Winter Fun, Activity, Beauty and Interest.

Goal D2:
Design Our Communities for Winter Safety and Comfort

Winter Economy

Goal E1:
Increase the Capacity and Sustainability of Edmonton's Winter Festivals

Goal E2:
Develop a Four-Seasons Patio Culture

Goal E3:
Become a World Leader in Innovative Winter-Related Business/Industry

Our Winter Story

Goal S1:
Celebrate the Season and Embrace Daily Living in a Cold Climate

Goal S2:
Promote Edmonton's Great Northern Story Locally, Nationally and Internationally

Goal S3:
Kickstart and Lead Implementation of Edmonton's Winter City Strategy: Apply a 'Winter Lens to Our City

In order to reach the goals, 64 actions were identified in the implementation plan. The development of the winter design guidelines is considered a key foundational action in the Winter Design pillar.

1.4 How We Came Together to Create These Guidelines

The Winter Design Working Group, a subcommittee of the WinterCity Advisory Council, is dedicated to completing the actions of the Winter Design Pillar. The group is made up of a diverse set of volunteers from the public and private sectors, educational institutions and not-for-profit organizations, including the Edmonton Federation of Community Leagues. The individuals were chosen because of their expertise and interest in urban planning, urban design, architecture, transportation, engineering, landscape architecture and land development.

A core project team was formed to support the Winter Design Working Group. The team co-ordinated, managed and completed project tasks, as directed by the working group. The core team included City staff from City Wide Planning and the WinterCity Office.

Guiding Principles

The Winter Design Working Group developed the following guiding principles, which align with the overall WinterCity Strategy Guiding Principles. These principles were referred to throughout the guideline development process.

Authentic

- Design with our particular northern/winter context in mind, and contribute to our own uniquely-Edmonton story.
- Use neighbourhood, street, public space and building design that is optimal for our climate.
- Enhance daily life for Edmontonians.

Attitude-changing

- Emphasize the potential for winter design to improve our quality of life.
- Erovide innovative, interesting and more functional approaches that support desired winter activity/life.

Sustainable

- Design with priority for pedestrians and cyclists of all ages and abilities.
- Ensure design considers on-going maintenance and operations.
- Be environmentally responsible.

Design Dens

The core project team organized three main workshops, called Design Dens, to collaborate with broader stakeholder groups. The Design Dens served as an opportunity to share information about winter design with community builders, provide updates on the development of the guidelines, and gather strategies, ideas and actions from participants.

Participants at one of the Design Dens

1.5 Framework and How to Use the Guidelines

The Winter Design Working Group, a subcommittee of the WinterCity Advisory The design guidelines themselves have been organized into two areas. The first area focuses on streets, which are the main public spaces of our cities, and the second on parks and open spaces. Each area has a goal and two desired outcomes, as described below.

The Streetscape

Goal: Design our communities for winter comfort, safety and aesthetic.

Outcomes:

1. Buildings are designed so that their impact on the public realm creates better microclimates, as well as public places that are more vibrant and inviting.

2. Streets are vibrant and attractive people-places in all seasons.

Open Spaces

Goal: Design elements for winter fun, activity, beauty and interest.

Outcomes:

1. Parks and open spaces are used and enjoyed year-round.

2. Public spaces support outdoor winter programming, recreation and everyday winter life.

These guidelines establish a common language and a robust winter lens for design collaboration between city-builders. All users of the guidelines should identify opportunities to integrate winter design into land use policies, regulations (e.g. zoning bylaws) and development.

Key Audience

The guidelines are intended to be used by all city-builders: landowners, developers, planners, architects, designers, engineers, and their respective consultants; and, City staff reviewing development applications. These guidelines will also be a useful resource for community groups and the general public.

Where the Guidelines Apply

All relevant winter design outcomes are to be addressed in the planning and design of any new land development proposed throughout the City of Edmonton. All development permits must demonstrate how the winter design goals and outcomes will be achieved, and how the associated rationale is being addressed. This includes, but is not limited to: Area Structure Plans, Neighbourhood Structure Plans, Area Redevelopment Plans, Corridor Plans, LRT Station Area Plans, Special Area Zones, direct control zoning and development permits.

HOW TO APPLY THE GUIDELINES

1. Review the goals, outcomes and relevant guidelines to inform the planning and design of a neighbourhood, site and/or building.

2. Clearly demonstrate how the goals and outcomes will be achieved with your submission.

1.6 Aligning with Other Strategic Plans and Policies

The Way Ahead and The Ways Plans

The spirit and content of these guidelines are aligned with the four guiding principles of the *City of Edmonton's Strategic Plan, The Way Ahead*: integration, sustainability, livability and innovation. Adherence to the guidelines will have a direct impact on people's sense of well-being.

The Winter Design Guidelines support the Strategic Plan's companion *The Ways* documents. The following are a few examples of goals and objectives that are supported by the Winter Design Guidelines.

- The goals of creating healthy and livable communities, and the specific policy of encouraging urban design which reflects that Edmonton is a winter city, allowing residents to enjoy the city in all seasons. – *The Way We Grow*
- The strategic objectives to create a walkable and cycle-friendly city. – *The Way We Move*
- The goal of Edmonton being a vibrant livable city, one that boasts a high quality-of-place experience. – *The Way We Prosper*
- The objectives of creating a built environment that encourages active modes of transportation, and enhancing the recreational benefits of parks and open spaces. – *The Way We Green*

Other Alignments

The Winter Design Guidelines have connections to many other City documents; however, strong alignments occur with the Urban Parks Management Plan, the Complete Streets Policy, as well as to the Light Efficient Community Policy. See Appendix # for a list of statutory and non-statutory documents that should be reviewed in conjunction with the Winter Design Guidelines.

1.7 Integrating Land Use and Transportation

Streets are the most visible and plentiful part of our shared public realm, and are critically important for creating a comfortable, safe and beautiful winter city. Historically, transportation systems have been designed based on roadway classification, with the primary focus of connecting automobiles to destinations. However, streets also function as social spaces and should be considered places in their own right.

WINTER DESIGN AND HEALTH

Urban design is an essential tool for combating the most pressing public health problem of our time – obesity and its related chronic diseases. Creating inviting and comfortable spaces in the wintertime not only encourages people to be more active in the winter, but it also invites more social interaction. Both physical activity and social interactions can have a positive impact on mental health, and can help combat social isolation often described as the 'winter blues'.

WINTER DESIGN AND YEAR-ROUND CYCLING

Planning and design are the bedrock of active transportation. It is well documented that the main deterrent for winter cycling is not the cold, but a concern for safety. The key to addressing these concerns is providing the right infrastructure. Cities that encourage year-round cycling support separated bike lanes and provide proper maintenance levels in winter. Cycling as a form of active transportation will only become mainstream in Edmonton if adequate infrastructure is provided; this is especially true for winter cycling.

Winter cycling (old image: Mayor Don Iveson and Councillor Amarjeet Sohi on kicksleds)

Complete Streets

The City of Edmonton has adopted a Complete Streets approach to planning and designing Edmonton's transportation system. This means integrating transportation and land use, and encouraging active transportation in all seasons. The Complete Streets Guidelines provide details on various streetscape design elements and should be used as a companion to the Winter Design Guidelines. More information can be found at ***www.edmonton.ca/completestreets***.

Complete Streets planning considers roadways to be both links and places. Roadways are recognized as links because they facilitate the movement of people, but roadways are also places because streets themselves can become destinations. Designing for all modes, with both link and place considerations, is critical to helping the city transition to a transportation network that is safer and more sustainable. It will also provide public spaces that are inviting for people and businesses.

The Winter Design Guidelines support the Complete Streets movement, designing streets with place considerations, and planning for better infrastructure. The physical elements of the streetscape – lanes, sidewalks, curbs, furniture, landscaping and utilities – all perform important functions and can help to create an outdoor living room, even during the cold months.

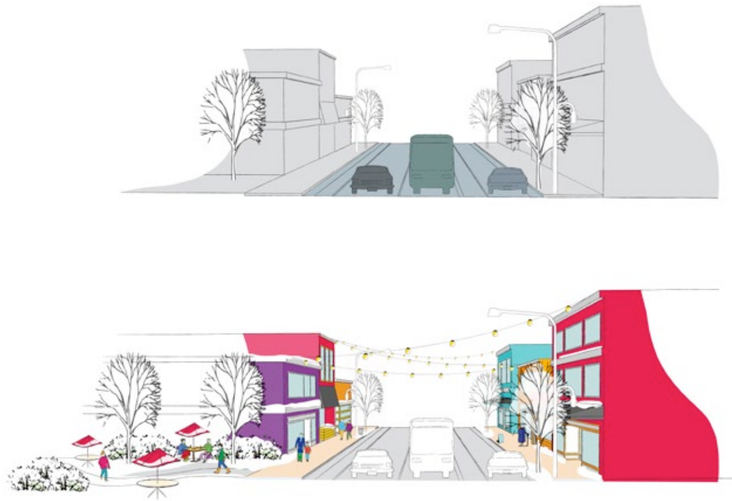


Illustration based on the City of Edmonton Complete Streets "Link and Place" Diagram

MODAL PRIORITY NETWORKS

With planning and design, it is important to define the modal priorities for a particular street. The modal priority networks are defined in the Complete Streets Guidelines. The following is a list of examples of modal priorities. The Winter Design Guidelines frequently refer to pedestrian, transit and bicycle priority areas, and provide specific guidance for them in particular.

Pedestrian Priority Network

Existing and future Pedestrian Shopping Street Overlay areas

Roadways identified for pedestrian priority in the Downtown Plan

Transit Avenue

Transit Oriented Development Area

Transit Priority Network
(LRT routes and high-frequency Bus Corridors)

Cycling Priority Network
(Refer to the City of Edmonton Bicycle Transportation Plan)

N.B. Modal Priority Networks continue to be updated as the city grows and evolves. Stakeholders should refer to the Complete Streets Guidelines for additional information.

1.8 Implementation, Monitoring and Future Amendments

Implementing the Winter Design Guidelines will require the collaboration and investment of many organizations and agencies. This includes the full spectrum of the planning and development processes, from high level strategic plans right down to a development permit on a single site.

As a winter city, it is important that we design for our dominant and defining season at all levels of city building. Monitoring and evaluating urban design, particularly across an entire city, is no simple task. The Next Steps section of the document specifies a range of implementation opportunities, including new development and construction standards that will enforce winter design, and continuous learning and recognition programs to communicate and share leading-practice design and innovation in Edmonton. Some implementation opportunities are achievable in the short term, while others may take years and be ongoing.

Ultimately, applications for new development and redevelopment will be required to demonstrate how the five winter design principles are incorporated, and how the applicable outcomes are addressed.

The guidelines may be periodically amended to remain consistent with statutory policy, and to evolve both with lessons learned through implementation and with emerging leading practices.

2 Winter Design Guidelines

The Streetscape

WHAT IS THE PUBLIC REALM

Any publicly accessible street, pathway, right of way, park, school site, open space or publicly accessible civic building/ facility. The quality of our public realm is essential to creating environments that people want to live, work and play in.

GOAL:
Design our communities for winter comfort, safety and aesthetic appeal

Improving the Public Realm

The following section provides practical and tactical urban design guidelines for urban and suburban spaces. It speaks to the interrelated components of the streetscape: built form and public realm interface, streetscape elements, and linkages.

Street design involves quality place-making that supports livability, urban vitality and sustainability. The overall intent is to improve the public realm to support an active, attractive streetscape that serves as a link and place year-round.

2.1 Built Form and Public Realm Interface

The Streetscape Outcome 1:

Buildings are designed so that their impact on the public realm creates better microclimates, as well as public places that are more vibrant and inviting.

Rationale:

There is an interrelationship between buildings and the public domain. Buildings frame public spaces, and their design has a huge impact on the vibrancy of our city. Building design, massing, surrounding structures and site exposure all have a direct impact on microclimates and pedestrian comfort at the street level. Even moderate breezes can be accelerated to speeds that become uncomfortable or detrimental to the enjoyment and success of outdoor spaces, such as patios, restaurants and recreational areas.

Sunshine, especially on cold winter days, makes people feel warmer. In fact, capturing direct sunshine and blocking wind can make an outdoor public space feel 10°C warmer (Environment Canada). The use of colour and the creative use of lighting can also add much to make a place more beautiful and inviting.

Compact, mixed-use streets reduce travel distances to work, shopping and activities during the winter months

2.1.1 Neighbourhood-Level and Large Site Planning

A. Plan for weather and all seasonal conditions through street, building and open space design.

B. Design the street network and pedestrian routes to support small blocks, multiple route choices and quality street frontages.

C. Provide a street pattern and orientation that impedes prevailing winds, and public spaces that are framed and sheltered by surrounding development with blocks and parcels oriented to optimize solar access.

THE PHYSICAL DESIGN OF A NEIGHBOURHOOD DETERMINES HOW EASILY AND SAFELY RESIDENTS CAN WALK TO DESTINATIONS

In a winter city, design should consider factors such as snow, ice and snow storage. Good design ensures safety and security by allowing people of all age groups, especially children and the elderly and also those with physical disabilities, to function more independently within their communities. Ensuring accessibility to services and utilizing universally accessible design are key elements of high quality urban design.

- The Way We Grow: Edmonton's Municipal Development Plan

Climate Responsive Design at Blatchford City Centre, Edmonton, AB

Open space design takes advantage of building placement to block winter winds and create pleasant south-facing seating areas.

D. In order to provide a more inviting walkable realm in winter, provide more compact development that is fine-grained, with uses that are street-oriented.

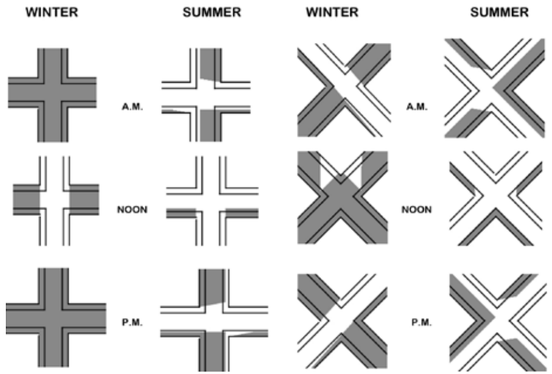
E. Consider opportunities for mid-block accessways and/or block-breaking with alleyways. Small shops and restaurants that front along the alleyways should be encouraged, as the alleyways may develop into active pedestrian routes, especially if they provide protection from the weather.

F. Plan for smaller snow storage areas with solar access, rather than one large shaded area, as the snow will melt faster. Balance the need for local snow storage with other considerations, such as walkability, aesthetics and parking. Consider the neighbourhood context, scale of proposed development and interface with adjacent sites. Site drainage plans should account for the run-off during freeze-thaw cycles during winter and spring.

SUN RHYTHM FORM

"Streets that run east-west in a built-up area will tend to be shadowed during all of a winter day. The streets thus remain dark and cold. By contrast, streets that run north-south are lighted and warmed during the midday. In summer, streets that run north-south will be shadowed in the morning and the afternoon, but will receive the full force of the midday sun."

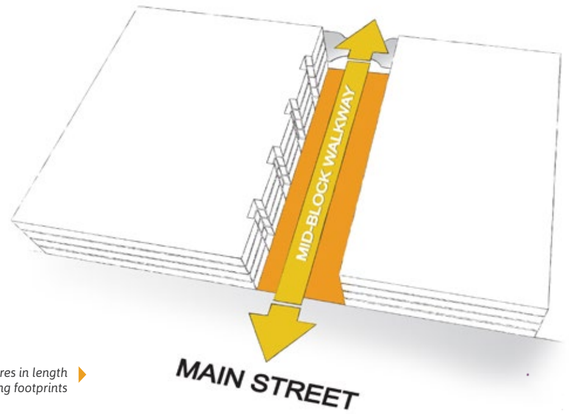
- Ralph Knowles, Sun Rhythm Form



Shadows cast during Winter and Summer Solstice in Edmonton, with three-storey (10m) buildings and a building-to-building distance of 15m, for demonstration purposes

HIGH-RISES DO NOT MAKE A WINTER CITY GREAT

In some great winter cities, high-rise buildings are actively discouraged in order to allow for more sunshine on streets and public squares, and to minimize wind turbulence at the base of buildings.



Mid-block accessways are encouraged to break up blocks of 120-150 metres in length in order to provide greater connectivity and pedestrian-scaled building footprints

2.1.2 Streetwall Height, Massing and Orientation

A. Design the street wall, or podium for medium and tall buildings, to be no higher than the width of the road, creating a 1:1 ratio. Street trees may be used to help provide a similar sense of definition and enclosure in areas with lower heights and less dense buildings.

B. Consider solar access in the placement of buildings and outdoor spaces. Building massing and siting should create minimum shade onto open spaces that are, or could be, used in the wintertime.

C. Accommodate taller structures on the north side of streets to avoid excess shadow-casting over sidewalks, patios and outdoor spaces.

APPROPRIATE STREETWALL HEIGHTS CREATE STREET DEFINITION AND CONTRIBUTE TO A PEDESTRIAN SCALE

The overall height of a mid-rise building should not exceed the width of the adjacent street right-of-way. For buildings taller than six storeys, special attention should be given to the design of and materials used on the first two to three storeys of the building, as they impact pedestrian perception at the street level.

Awnings, canopies and arcades on mixed-use commercial streets provide colour, interest, texture and weather protection to the streetscape.

Pedestrian-oriented shopping main street

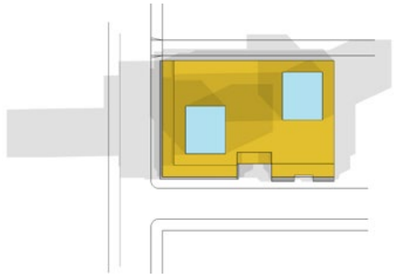
D. Determine optimal site orientation and massing to reduce wind speeds at the street level. The use of stepbacks or tiered (doubled) podiums at the base of a slim tower(s) is a useful strategy to dissipate downdrafts. The consultative services of a microclimate specialist or a building designer may be required to assess contextual wind, snow and shadows for the development of medium and high-rise structures over six storeys. Use open spaces on podiums for landscaping and amenity spaces.

E. Vary building heights along a block length to reduce ground-level wind speeds. Where appropriate, one- or two-storey variations are preferred for low- and medium-rise developments.

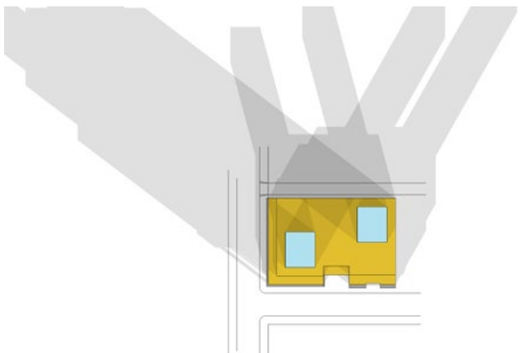
SUN/SHADOW STUDIES ILLUSTRATE HOW A DEVELOPMENT IMPACTS THE AMOUNT OF DAYLIGHT THAT REACHES ITS SURROUNINGS

A number of simulation tools and programs are available to help visualize, or quantify, how a building affects sunshine and shadows on its own site and on neighbouring properties over a period of time. This is commonly referred to as a butterfly, or shadow diagram. Typically, sun and shadow studies that are submitted for review in Edmonton reflect conditions at 0900, 1200 and 1500 hours Mountain Standard Time (MST) on December 21st, March 21st and June 21st.

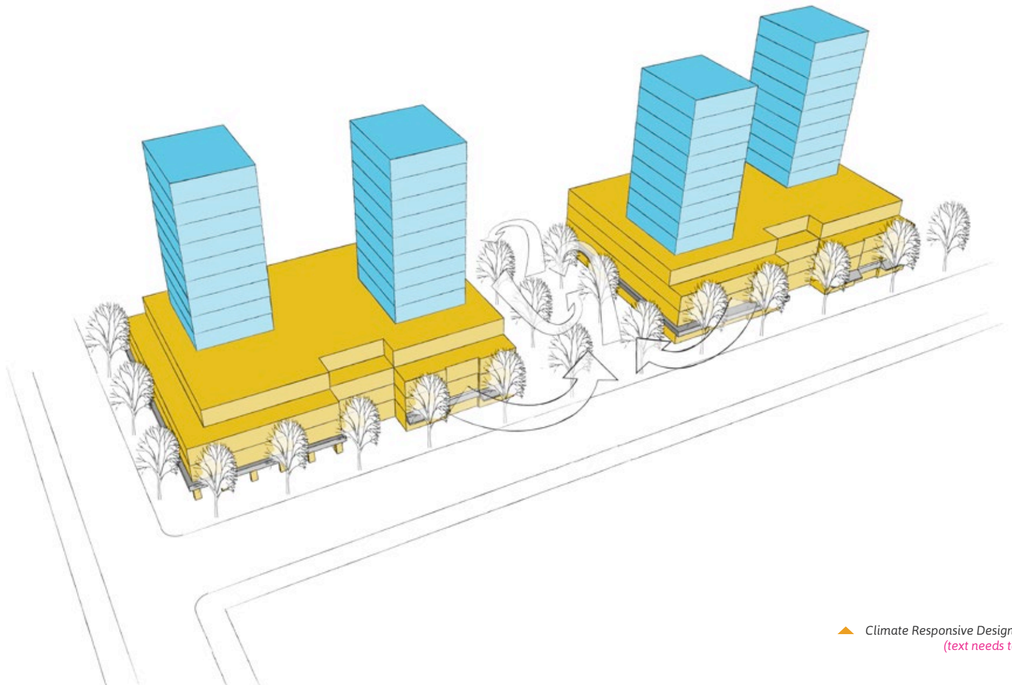
3-D modelling software tools are also available, and can produce a more detailed picture of how a building's shadows affect its surroundings. For example, a 3-D model may reveal an area that does not receive any sunshine at a given time of year.



Shadow Diagram: Summer Solstice 0900, 1200 and 1730 hours MST
correct this time!



Shadow Diagram: Winter Solstice 0900, 1200 and PM & 1730 hours MST
correct this time!



Climate Responsive Design illustration
(text needs to be edited)

WHAT IS A MICROCLIMATE?

A microclimate is a local atmospheric zone where the climate differs from the surrounding area. In urban settings, tall buildings create their own microclimates, both by overshadowing large areas and by channeling strong winds to ground level. Airflow patterns can vary greatly from block to block in a city, based on a number of contributing physical and climatic factors.

In Edmonton, very cold winters, warm summers and variable daylight hours throughout the year contribute to the complexity. Technical studies and analysis by a specialist will assist with applying microclimate principles to create a more comfortable experience for people at the street level not only in winter, but also year-round.

2.1.3 Roof Design

A. Design roofs to prevent falling ice, snow and discharge of roof leaders onto entrances and walkways. The roof design should be strong enough to handle variable snow loads throughout the winter.

B. Assess complex roof shapes against pedestrian accesses and/or exterior amenity areas to reduce ice and snow hazards. Elements to consider include slippery-sloped surfaces, barrel vaults, roof steps, tower and podium interactions, and the direction of shedding snow loads.

C. Design light wells and roof orientation to increase solar access to building interiors and covered outdoor spaces.

D. Consider metal roofing as a durable cold weather material. The metal allows snow to shed with ease, so the direction of roof slopes must be evaluated. Snow guards help prevent snow and ice overloading at gutters and suddenly releasing from the roof.streets to avoid excess shadow-casting over sidewalks, patios and outdoor spaces.

Consider the direction of falling snow and ice onto entrances, walkways and stairs with variable roof shapes

Snow guards hold snow on a wind-drifted cornice at a retail entrance

Designing with a winter lens should reduce the need for this type of signage

HAZARDOUS ICE AND FALLING SNOW

The risk of ice and/or snow falling, sliding or being windblown from a building cannot be eliminated under all possible winter conditions. It is important for building owners and managers to provide maintenance staff with operational protocols and winter maintenance plans to deal with ice and snow formations. Pedestrian safety at the street level must be a priority.

Accumulation of icicles and snow may be indicative of building envelope problems, such as heat loss or leakage. Designers and builders should retrofit accordingly when the opportunity arises.

2.1.4 Architectural Design, Materials and Colour

A. Design building surfaces to help reduce wind speed. This can be accomplished by incorporating balconies, softened corners, tapered/stepped-back façades, and even porosity, openings and irregularities into a building's exterior.

B. Vary architectural details to support a sense of pedestrian scale and to distinguish between different building volumes and uses.

C. Use contrasting or saturated colour palettes on building façades to highlight pedestrian-scaled building massing and entrances, and to improve the visual interest of streets. Consider incorporating dense materials, such as brick and stone, to absorb and retain heat.

D. Design facades to sensitively reflect light onto streets, north-facing neighbouring buildings and/or into open spaces. Lighter colours on south-facing walls also passively reflect light.

E. Use high-quality materials that will withstand the freeze-thaw cycle and conserve energy.

F. Assess and manage the accumulation and life span of ice and snow formations on façade surfaces. For example, high performance glazing reduces heat loss and melting along window sills, allowing snow and ice to build up.

The Mountain, by BIG Architects, combines south-facing terraced apartments over a porous metal parkade façade in Copenhagen, Denmark

COLOUR MASTER PLANNING

In Sweden, the town of Longyearben has adopted a colour master plan for all buildings. This combats monotony in the urban winterscape, while providing a pleasing colour palette that adds vibrancy.

A mix of durable materials and colours give a large building a more pedestrian-scale feel

The appearance of a city can be changed significantly with colourful buildings, such as The Venetian in Edmonton, AB

Bright and diversely-coloured houses contribute to a beautiful winterscape in Reykjavik, Iceland

Colourful illuminated façade of Palais des congrès in downtown Montreal, QC

A strong street interface supports a lively public realm in winter

2.1.5 Public Realm and Street Interface

A. Locate major glazing areas and transitional indoor and outdoor spaces, including patios and porches, on the south-facing side of the lot to benefit from the penetration of heat and sunlight. Add sun shades to receive the best combination of winter warming, summer shading and daylighting potential.

B. Determine suitable building setbacks and variations in building frontages to enhance the pedestrian experience. Use setbacks to create sun traps and shelters from the wind. Reflected or radiated heat from surfaces within sun traps can provide year-round spaces for restaurant patios and retail.

C. Incorporate transparent glazing into building façades for visual access to internal uses, as well as for passive surveillance and illumination between outdoor spaces and building users. A high degree of visibility through building windows and/or doors supports safe and active streets and urban parks or plazas.

STREET FRONTAGE

Where retail is not viable at the street level, efforts should be made to activate the internal uses at ground level. Continuous windows at-grade, or the positioning of active internal uses, should be located along the street frontage.

Animate and activate streets by providing outdoor dining and retail opportunities to create pedestrian-oriented streets

Where possible, encourage business uses that will remain open during the day and into the evening to help animate streets and open spaces

The patio at Café Bicyclette is enjoyed year round in Edmonton, AB

SOLAR EXPOSURE

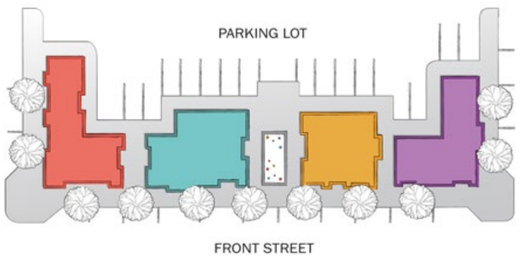
Passive solar design principles take advantage of the sun's rays to form part of the heating component of a building. South-facing windows allow for potentially high solar gains in most of Canada, particularly during the winter months when the sun is at a low angle and shines directly into many buildings. Simple solutions like opening curtains and blinds can passively heat a room, office or public space in the winter. Both winter and summer shading performance, as well as year-round comfort design requirements, can be determined in detail using the Passive House Planning Package (PHPP) design software.

2.1.6 Building Entries

A. Create fine-grained development: buildings with narrow frontages, frequent storefronts and minimal setbacks from the street. Main entrances to buildings should face the street, and have access from a sidewalk.

B. Strengthen the public realm interface by providing building entries along external spaces, such as plazas and urban parks. Cover and protect ramps and stairs from ice and snow to ensure safe movement for all pedestrians, including those who use wheelchairs, walkers and strollers. Consider heating options, where appropriate.

C. Incorporate transition areas, arctic entries, vestibule enclosures and grate drains at building entrances for patrons to shed snow prior to entering the building. This also prevents heat loss from buildings and reduces damage to escalators and flooring.



Main entrances face the street with off-street parking located at the rear of the site

A fine-grained, mixed-use street is resilient and provides options

Temporary sidewalk vestibules are becoming popular in the winter in New York City, USA

Barrier-free building entry in downtown Edmonton, AB

D. Provide a seamless-grade transition between commercial entrances and the sidewalk. Incorporate barrier-free design principles and consider changing seasonal conditions, such as snow or ice accumulation.

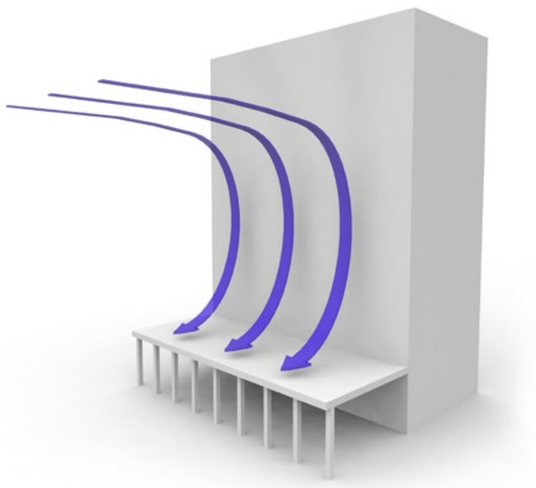
E. Delineate the separation between public and private spaces, and provide room for snow storage with a grade separation between the sidewalk and ground floor level of residential units. This is also a good strategy for flood mitigation. Accessibility and barrier-free design should also be incorporated.

F. Avoid creating wind tunnels, particularly in Pedestrian and Transit Priority Areas. Where wind tunnels already exist, retrofit buildings or design street installations to improve pedestrian and patron comfort.

G. Incorporate simple technologies for accesses to industrial and larger commercial buildings, such as bay door controls, air curtains and dock seals to prevent heat loss in winter.

UNIVERSAL, INCLUSIVE AND BARRIER-FREE DESIGN

We must try to make our environment usable and accessible for all people, regardless of age or ability. Snow, ice and darkness change our landscape, presenting mobility and safety challenges for everyone. Planning and design of buildings and streetscapes must not only employ universal and inclusive design principles, but must also consider all four seasons in order to minimize hazards and ensure a better winter experience for everyone.



Canopy to reduce downwashing effect

2.1.7 Awnings, Canopies and Arcades

A. Design positive indoor-outdoor relationships between buildings and their surroundings. Strategic use of canopies, arcades and passages can provide protection from wind, falling snow and ice.

B. Use colour and lighting on awnings to add interest and character on all types of buildings, including apartments, office towers and retail.

C. Connect pedestrian spaces with elements such as treed arcades, awnings or canopies to moderate the impacts of winter weather, particularly where pedestrian traffic is present or desired.

Awnings add colour and texture to the street, even when covered in snow

D. Provide weather protection along building frontages, whenever possible, using canopies as the primary method for coverage. Ramps and/or stairs should also be protected from snow and ice.

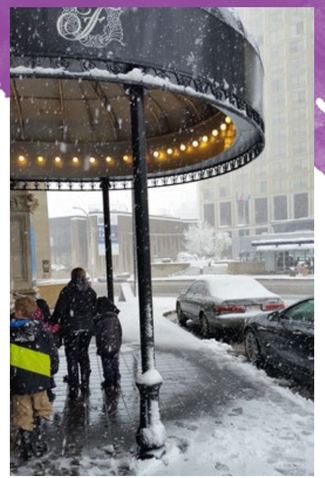
E. Incorporate arcades or overhangs on key retail streets, where possible, to enhance pedestrian comfort.

F. Consider the use of transparent materials to allow the sun to penetrate through awnings and canopies.

G. Accentuate primary entrances to multiple-unit residential buildings through the use of entrance colonnade structures, awnings, canopies, marquees, portes-cochère and other architectural elements.

Durable, transparent materials allow for natural lighting

Arcades provide weather protection, identity and decoration



Canopy installations may require winter maintenance during the snowy season

2.1.8 Building Lighting

A. Integrate fixtures into building façades to allow for temporary or permanent specialty lighting, such as seasonal or creative lighting. Feature lighting is one of the most effective ways of creating a special winter atmosphere.

B. Design building lighting to enhance visibility, aesthetics and safety for building users and pedestrians. Lighting choices should minimize glare, uplighting and light trespass, while still enhancing architectural details. Designs should feature subtle contrast, colour, and in some cases, gentle undulation.

C. Seek to coordinate seasonal and permanent building lighting designs to create a unified aesthetic for the night skyline, as well as for high-use walkways and featured areas.

D. Incorporate lighting to ensure pedestrian and vehicular entrances are easily distinguishable from the building façade at night.

E. Add visual interest to streets by considering creatively-lit signage, awnings and canopies for residential, mixed-use and commercial buildings.

FUNCTIONAL AND CREATIVE LIGHTING

Installations should be energy-efficient and designed to minimize light pollution. Refer to the City of Edmonton Creative Lighting Master Plan for more detailed information.

Architectural lighting at the Alberta Legislature in Edmonton, AB

RGB-illuminated building in downtown Moscow, Russia

2.1.9 Building Signage

A. Design building signage to promote building identity and wayfinding.

B. Illuminate signage after sunset.

C. Use clear fonts and contrasting colours to increase visibility and interest.

The Parlour on Capital Boulevard in Edmonton, AB

Ice Hotel Signage in Oslo, Norway

Entrance to the Aurora housing development by Melcor Developments in Edmonton, AB

2.1.10 Site Landscaping and Vegetation

A. Select vegetation for landscaping near roadways that can withstand exposure to gravel, sand, salt and ice melters. Vegetation should be able to withstand snow loads, wind and require little maintenance throughout the year.

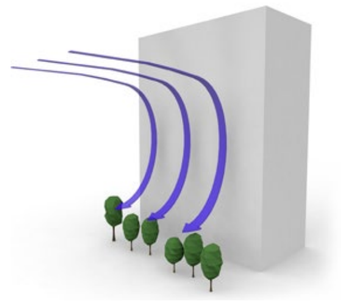
B. Give preference to native plants, grasses, shrubs and trees that are colourful and/or look attractive covered with snow. There are also many non-native plants that offer winter interest and may be suitable.

C. Set plant material back from sidewalks and parking spaces to accommodate temporary snow storage. Plant landscaped areas surrounding buildings to withstand excess snow and ice from roofs, as well as increased snowmelt. Also consider spring maintenance, site and soil restoration, and vegetation growth.

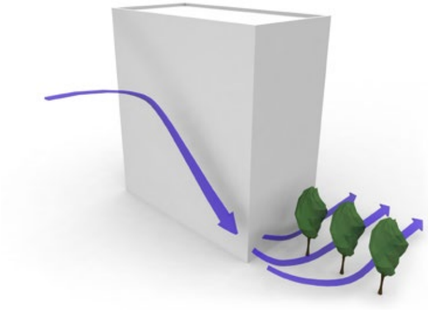
Trees that retain their berries or fruit in winter add beauty and will attract winter birds

Some plant species depend on snow cover to protect them from cold air and to help them survive through the winter

Native trees and shrubs are sturdy, and are beautiful covered in snow and lights



Wind downwashing effect reduced and redirected by using trees, based on wind-study modelling



Wind corner acceleration effect reduced through the use of trees, based on wind-study modelling

D. Use planting beds surrounded by curbs to lessen damage due to snow clearing equipment. Raised beds can also protect plants from salts and gravel, but this can also be addressed through careful site grading.

E. Plant deciduous trees on the southern face of a building or outdoor area. Deciduous trees will provide shade in the summer when leaves are present, but will allow sunlight to filter through in the winter, when leaves have fallen.

F. Place coniferous vegetation on the north and west sides of open outdoor spaces to protect areas from prevailing winter winds. Coniferous trees can also create snow drifts in some conditions, so designers must carefully consider the site context. Hedges will also modify the extent of a snow drift based on their porosity. Dense planting should be carefully placed relative to walkways and shared use paths in anticipation of snow drifting patterns.

G. Reduce wind speed in open spaces by planting dense vegetation against large, blank exterior walls.

H. Use soft landscaping to filter and screen views into private dwelling units, while ensuring views to the street or open spaces are maintained for surveillance.

2.1.11 The Pedway System

In recent years, revitalization in downtown Edmonton has resulted in an expansion of the pedway network, to the delight and dismay of many. The pedway issue is a complex, if not inflammatory subject, not only in Edmonton, but also in other cold climate cities with pedestrian bridge and/or tunnel systems.

In winter cities, many residents find the elevated systems practical, as users are protected from cold, wind, snow and ice. On the other hand, bridges and passages have a tendency to accelerate wind speeds at the street-level, creating a harsh street environment for pedestrians and users of other active transportation modes, and for businesses that rely on foot traffic.

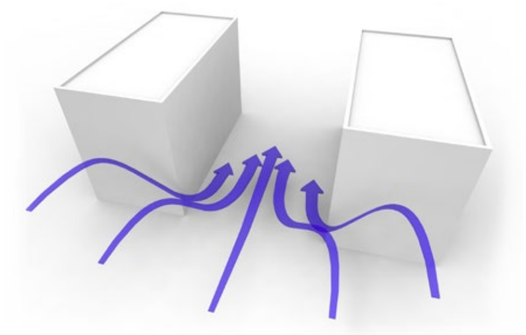
Elevated and underground systems pose a unique challenge in our urban centres by dispersing people over different levels at different times throughout the day. Danish architect and public space expert Jan Gehl has noted that skyways violate the first law of successful city-building: keeping people together in a critical mass. Instead, a social hierarchy is created, with wealthier classes in quasi-private spaces at certain times, and poorer citizens occupying public spaces at all hours. Generally, elevated systems are considered bad for civic life, bad for retail business and bad for culture, but very good for office towers.

Using deductive reasoning, if cities are defined by the vitality of their street life, and elevated systems are seen as a significant detractor of street life, the City of Edmonton should not allow any further expansion of the pedway network, except in very exceptional circumstances.

A PEDWAY IS NOT A BUILDING;
IT IS ATTACHED TO A BUILDING.

A PEDWAY IS NOT A STREET;
IT IS BUILT ABOVE A STREET.

A PEDWAY IS NOT OPEN TO ALL,
ALL OF THE TIME; IT IS OPEN TO SOME,
SOME OF THE TIME.



▲ *Wind acceleration route through a passage and under a bridge, based on wind-study modelling*

2.2 Streetscape Elements and Linkages

The Streetscape Outcome 2:

Streets are vibrant and attractive people-places in all seasons.

Rationale:

Good street design begins with an understanding of street context. Different streets have different conditions and require different design solutions. However, all great winter cities not only support active transportation, but give greater design consideration to the infrastructure needs and maintenance requirements needed to support pedestrians, transit users and cyclists in winter. As well, our streets are an important place for civic definition, that is, for social and commercial interaction. The physical elements of the streetscape – sidewalks, furnishings, landscaping and utilities – all perform important functions, helping to create an outdoor living room, even during the cold months.

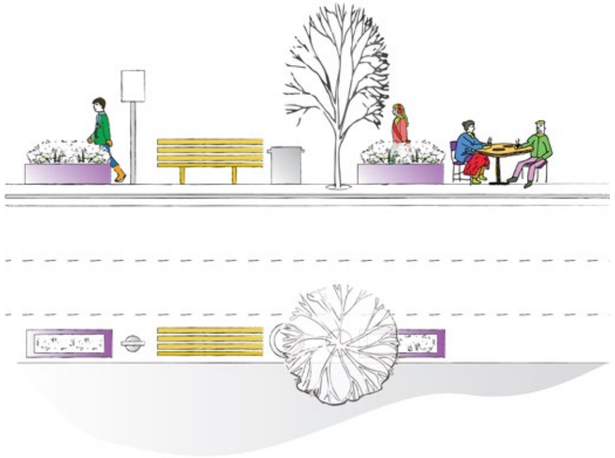
▲ *Street-oriented architecture and urbanism support lively, public spaces*

2.2.1 Sidewalks and Boulevards

A. Design wide sidewalks in Pedestrian and Transit Priority Areas to provide a clear, barrier-free pedestrian throughway zone. Adequate space for street-cleaning and snow-clearing equipment must be considered in the design.

B. Provide boulevards. Boulevards are an important snow-storage area, and result in reduced operational snow removal costs. They also act as a buffer to protect pedestrians from road spray. Use of monowalks must be justified.

C. Provide furnishing zones on commercial-pedestrian sidewalks. Furnishing zones may be designed as a landscaped strip or paved as a hardscape with tree wells to maximize the pedestrian through-area. Street context must be assessed to determine if snow storage or removal is most appropriate.



For additional all-season streetscape design details and amenities, please refer to the Complete Streets Guidelines

SNOW REMOVAL POLICY

As a winter city, Edmonton's specified standards for snow clearing are key to ensure mobility and safety of all users of the transportation system. The Snow Removal Policy approved by City Council outlines expected performance outcomes.

– The Way We Move

Shop entries and pedestrian throughzone are clear of snow, ice and pooled water in Calgary, AB

D. Ensure sidewalk grading directs snowmelt towards roadways, and away from sidewalks and building entries, to avoid slippery conditions during freeze-thaw cycles. Potential contaminants from snowmelt (i.e. salt, ice melters and sand) should not drain into creeks, rivers or natural areas.

E. Select paving materials that are durable enough to withstand the harsh impacts of winter snow management and the corrosive effects of salt, as well as freeze-thaw cycles, while still being safe, slip-proof and easy to maintain.

F. Apply colour, pattern variation and decorative paving bands in Pedestrian and Transit Priority Areas. Variations in colour or material will add visual interest and can indicate circulation in the pedestrian throughway zone. Decorative paving bands along the curb-side serve to align fixed objects such as trees, street lights, parking meters, bicycle rings, waste and recycling receptacles.

CULTURE SHIFTS OVER TIME

Winter cycling is not our culture? Remember that culture shifts over time. If we are going to mainstream cycling in all seasons, then we cannot go halfway with cycling infrastructure. Painted lanes are first-generation infrastructure. A more mature approach is to build separated bike lanes that can be properly maintained in winter.

Boulevard trees on a local roadway – ensure a sufficient soil volume will support tree growth to maturity

G. Provide landscaped, permeable surface areas on or near roadways to provide a natural filter for snowmelt and heavy rainfall, reducing pressure on the drainage and water network. These landscaped features could also be used as design opportunities to introduce traffic calming to a street and to improve crosswalks on wide streets.

H. Reduce automobile lane right-of-way widths in Pedestrian, Transit and Bicyclist Priority Areas. Narrow lanes result in less road surface to clear of snow during the winter, and extended sidewalks with shared-use paths accommodate a variety of active transportation modes. Consider how any reallocation of space or roadway redesign would best accommodate all modes safely in all weather conditions. Needs of municipal maintenance, operation and emergency vehicles must always be taken into account.

Street-beautifying bioswales support healthier waterways in Brooklyn, USA

LIVABLE STREETS ALLIANCE

"It isn't often that a complex problem can be significantly solved by a single remedy. But when it comes to finding ways to make car-dominated streets more pedestrian and cyclist-friendly, narrowing the lane widths is a game-changer. Critics worry about safety and capacity, but new research refutes these fears."

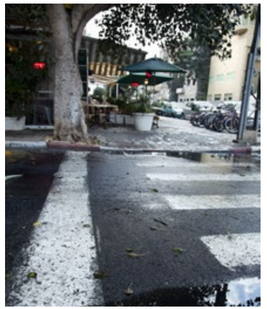
– Steven Miller, Livable Streets Alliance

2.2.2 Street Crossings

A. Install lit or reflective crossing signs and surface markings to increase visibility of crosswalks during reduced daylight hours in winter. Use traffic control stop/yield signs, signals or other vehicle warning techniques where warranted in Pedestrian, Transit and Bicycle Priority Areas. School zones may require additional installations.

B. Locate catch basins for surface runoff away from pedestrian crossings and bus stops. Pooled water at crosswalks may splash onto pedestrians from vehicles during warmer temperatures. During freeze-thaw cycles, freezing runoff water will create a slip-and-fall hazard.

Pedestrian-actuated street crossing



Thoughtful design should prevent pooled water at intersections

Varied road surface markings and colours clearly indicate a speed table and pedestrian crossing areas on a reflective zebra-striped street crossing

C. Prioritize pedestrians with short traffic signal cycles and pedestrian-actuated crosswalks to reduce waiting times and exposure during extremely cold temperatures.

D. Provide mid-block crossings with curb extensions on long blocks to reduce long distances pedestrians must travel to reach their destinations. Curb extensions that minimize pedestrian crossing distances are recommended where curbside parking lanes exist.

E. Consider contextual street crossing design. For example, different colours, themes or graphics that relate to the immediate area.

F. Research, test and evaluate street design features that are not currently found in Edmonton. For example, pedestrian platforms, that is raised street crossings, and/or heated sidewalks and crosswalks are commonly found on pedestrian-oriented streets in other winter cities.

Mid-block crossings with curb extensions not only reduce travel distances for pedestrians, which is important in cold and icy conditions, but they also slow traffic and provide opportunities for streetscape enhancements

Rainbow-painted crosswalk

2.2.3 Street Lighting

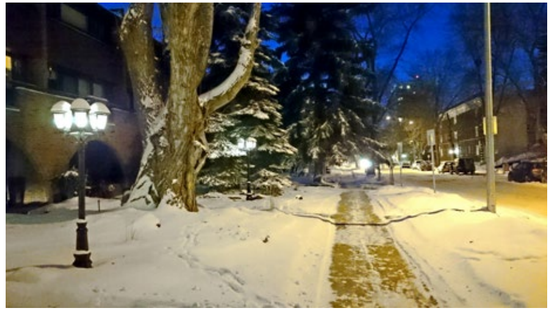
A. Provide decorative, pedestrian-scaled lighting. Focus illumination towards the ground to reduce light pollution. Use fully shielded fixtures to eliminate glare.

B. Include electrical outlets in tree wells and/or on street lamp posts to allow for additional seasonal feature lighting, such as tree wrapping. Well-lit focal points and landmarks can aid in orientation and help people find their way.

C. Assess, provide and test visibility after sunset, particularly in Priority Pedestrian, Bicyclist and Transit Areas to ensure safety, comfort and interest for active transportation modes. The colour and intensity of lighting, as well as the amount of glare, affect how a street is perceived and used.

THOUGHTFUL LIGHTING DESIGN

The difference between a pedestrian-lit street and a highly-illuminated highway automatically signals drivers that they have entered a new and different zone, and compels them to slow their driving speed. The canvas of natural darkness can be used as a backdrop to accentuate a full spectrum of lighting designs, including the gently beautiful, the playfully twinkly, or even the wildly whimsical!



Pedestrian-scale lamps on a residential street in Edmonton, AB

Decorative street tree wrapping on 104 Street in Edmonton, AB

D. Beautify the streetscape with creative passive lighting. Several types of materials can be added to surfaces, such as streets and sidewalks, to diffuse, differentiate, direct, increase or refract the amount of light already produced. Creative application of materials makes for a more interesting urban setting. Keep in mind that street lights are designed for safety and energy-efficiency.

E. Optimize roadway signage for low glare and good visibility in snowy conditions, as well as for aesthetic benefits. Look for opportunities to improve orientation, safety and perception of distances and space in snowy conditions with roadway traffic signal installations.

Illuminated traffic signals in this roundabout produce quality visibility and an attractive glow with the reflective properties of snow

The application of metal mesh on existing street lights produces beautiful illumination by reflection, with no additional energy required

Giant lampshades, designed by Lightemotion, in Quebec City, QC

CREATIVE LIGHTING

Creative lighting is not about more lights! Creative lighting is only effective with darkness as a backdrop. Ambient lighting needs to be reduced in general, and the use of selective, creative lighting interventions needs to be strategic. Solar and LED lights are encouraged to help reduce greenhouse gas emissions. For more information on the benefits of using creative lighting, refer to the Creative Lighting Master Plan.

2.2.4 Street Furnishings

A. Provide comfortable, protected and, preferably, south-facing areas for outdoor seating and dining. Overhead protection will support year-round use and provide shelter from snow, rain and the hot summer sun.

B. Consider ease of snow-clearing maintenance, particularly for benches. For example, it is easier to clear snow from around a bench with a central pedestal than from around a traditional bench with four legs.

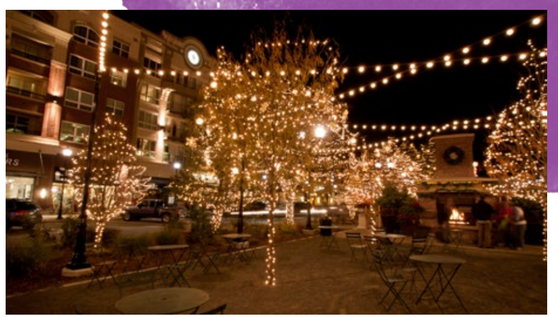
C. Select materials that are durable, comfortable and aesthetically pleasing. For example, metal can get very cold or hot, and neither extreme is particularly comfortable.

D. Provide both fixed and flexible street furniture to improve comfort. This will allow users to choose to sit in or out of the sun, alone or near others, or even near street features, such as trees.

E. Incorporate wind screens, lighting, gas fire pits and other heating features to improve comfort in seating and dining areas. Having blankets and seat cushions available for use will further improve the experience.

F. Arrange street furnishings for ease of winter maintenance. The placement of fixed furnishings should be carefully planned to avoid obstructing emergency vehicle access.

Round, wooden benches in an urban plaza in Bilboa, Spain



An outdoor winter living room in Denver, USA

EMBRACE A FOUR-SEASON PATIO CULTURE

Encourage restaurants and cafés to clear the snow from their patios and clean off their outdoor furniture. Outdoor seating opportunities and furnishings during both the winter months and the shoulder seasons contribute to street activity.

This south-facing patio is comfortable in February with wooden chairs and overhead heaters. Cushions, awnings, blankets, heaters and lighting are great additions.

An outdoor café

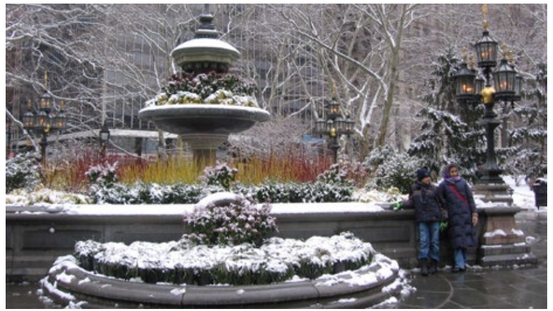
2.2.5 Public Art in the Streetscape

A. Create a welcoming environment that enhances the outdoor experience through embellishments such as landscaping, sculptures, furniture, lighting, and even fountains, which can be turned off and lit creatively in winter.

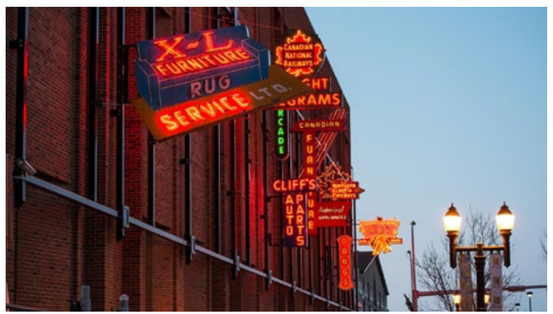
B. Support opportunities to incorporate public art for beauty, interest, animation and weather protection in urban streets and plazas.

C. Provide supporting infrastructure to install art that can illuminate otherwise dark urban areas and plazas, or locations not suitable for street trees or plantings.

D. Consider temporary construction fences as locations for attractive winter shelter, lighting, wayfinding and colorful artwork.



Winter Garden in New York City, USA



An otherwise blank wall is used to display the Neon Sign Museum in Edmonton, AB

The steel Trees sculpture was designed to reduce wind gusts between tall towers that line a commercial street in Calgary, AB

Sonic Bloom is an interactive, solar-powered sculpture in Seattle, USA, by artist Dan Corson

Giant holiday ornaments line the streets of New York City, USA

Urban Umbrella, designed by Young-Hwan Choi, is artistic, yet functional, construction hoarding made out of recycled steel, translucent plastic panels and LED lighting in New York City, USA

2.2.6 Wayfinding

A. Incorporate a signage and wayfinding system as part of the planning process, with design considerations for winter conditions. For example, approximate walking, cycling or cross-country skiing times, in addition to distances.

B. Design adaptable and seasonal wayfinding strategies to support changing uses and functions throughout the year; digital or automated systems are preferred. For example, changing signage at a park pond that displays ice skating conditions in winter.

C. Use blank walls that do not get covered in snow to display signage, public information or to generate solar power.

D. Provide signage along cycling routes that are prioritized for snow removal or grooming in winter. This could be as simple as a snowflake logo added to existing wayfinding elements to let users know that the routes will be maintained and/or cleared of snow on a regular basis throughout the winter.

E. Optimize wayfinding signage for low glare and good visibility in snowy conditions, and for aesthetic benefits.

WAYFINDING

Wayfinding can be defined as spatial problem-solving. It means knowing where you are in a building or an environment, knowing where your desired location is, and knowing how to get there from your present location.

Illuminating information and mapping not only looks attractive, but also helps residents and visitors to quickly discover where they want to go next

Clear, durable and high-quality wayfinding signage in Calgary, AB

2.2.7 Bus Stops

A. Provide infrastructure for real-time, next-bus information to improve user experience in extreme cold.

B. Retrofit existing high-use bus stops to improve winter weather protection.

C. Consider using light therapy, or phototherapy, in bus stops to help reduce Seasonal Affective Disorder.

D. Encourage special event or seasonal decorations for bus shelters that may also provide additional warmth or weather protection. Ensure design does not obstruct sightlines for oncoming vehicular traffic.

Doors and user-automated heating are now available in bus shelters in Fort McMurray, AB

Electronic sign showing the temperature and the arrival time for the next bus in Banff, AB

OUTCOME 2:
Streetscape Elements and Linkages

2.2.8 Light Rail Transit Stops and Transit Centres

A. Design LRT station platforms and transit centres with features such as shelters, roofs, canopies and overhangs to provide maximum weather protection.

B. Provide covered walkways at station entries to reduce snow and ice on walks, ramps and stairs. Include expansive grate drains to reduce mechanical damages and costs caused by the build-up of gravel and sand in escalators.

C. Install heaters, preferably motion- or user-activated, at shelters and transit centres to improve comfort for transit riders. Review potential snowmelt and drainage patterns caused by the addition of a heat source to avoid creating icy conditions.

D. Provide opportunities and infrastructure for multi-modal trips, such as secure and covered bicycle parking or Nordic ski storage.

A covered tram stop provides weather protection in Berlin, Germany

Skiers at the Gornergrat train station near Zermatt, Switzerland

Convenient access to the tram, shops and shelters in Istanbul, Turkey

Ski2LRT lockable rack for Nordic skis, designed by Shauna L. Rae and Alayna Dornbush, at the Century Park LRT Station in Edmonton, AB

Winnipeg Transit provides outdoor storage lockers for cyclists in Winnipeg, MB

2.2.9 Bicycle Routes and Storage

A. Prioritize higher volume corridors with cleared and dedicated routes to provide a safer environment for cyclists year round.

B. Consider covered bicycle racks and storage lockers in Pedestrian, Bicycle and Transit Priority Areas.

C. Connect existing and new bicycle routes through larger sites, such as district parks, to provide the most direct route for winter cyclists.

D. Provide real-time information to let cyclists know which routes were cleared of snow, and when, so that cyclists can plan their commutes accordingly.

A group of winter cyclists in Winnipeg, MB

Coloured pavement increases visibility and reinforces cyclist priority

WHAT IS THE MAIN DETERRENT TO WINTER CYCLING?

It may be a surprise to many, but research shows that it is not the cold. In fact, cycling in other winter cities drops off only when the temperature drops below -20°C. In Edmonton, the average highs for December, January and February are -5°C, -7°C and -3°C respectively – not exactly intolerable weather for cycling. So why don't more Edmontonians cycle in the winter? The main deterrent to winter cycling is concerns about safety, which is directly tied to infrastructure and maintenance. Good urban planning and design form the bedrock of safer winter cycling conditions.

2.2.10 Bridges

A. Provide pedestrian-scaled lighting and signage along shared-use paths.

B. Consider decorative lighting opportunities, where appropriate.

C. Review snowmelt and drainage patterns onto roads and pedestrian areas to prevent hazardous, icy conditions.

The High Level Bridge lit up in support of an Edmonton Oilers home game

Edmonton's High Level Bridge sports a state-of-the-art programmable lighting system with 60,000 LED bulbs purchased through the Light the Bridge campaign

2.2.11 Parking Considerations

A. Establish, and prioritize streets for, seasonal parking bans, where on-street parking would be limited to one side of residential streets during the winter.

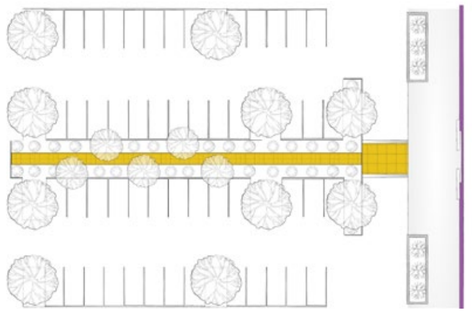
B. Select locations to introduce back-in angle parking due to the many benefits it provides over other parking types, including better vision of cyclists, pedestrians, cars and trucks, and better maneuverability on snowy days.

C. Provide a landmark feature at the main entrance of parking lots to help guide drivers and pedestrians, especially when the ground is covered in snow.

D. Provide pedestrian lighting and direct pathways between parking lots and connect paths to the main entrances of buildings.

E. Design parking lots to facilitate snow removal and maneuverability of equipment and fleet vehicles. Where possible, divide large parking lots into smaller areas, separated by planted islands.

F. Designate space in parking lots for on-site snow storage in areas that maximize sunlight and melting, while being mindful of drainage considerations.



Parking lots can provide great spaces for seasonal events, such as the All is Bright on 124 Street festival in Edmonton, AB

Parking lot designed with pathways to minimize pedestrian-vehicular conflict and with treed/planted islands to absorb snowmelt and to make it easier for people to find their cars

ACTIVE LIVING THROUGH DESIGN

Planning neighbourhoods that encourage active living through design is particularly important for reducing obesity and weight-related health issues, reducing air pollution and respiratory health problems, reducing stress and promoting good social and mental health.

– The Way We Grow: Edmonton's Municipal Development Plan

City Hall ice rink in Edmonton, AB

Open Spaces: Embracing the Outdoors

GOAL:
Design elements for winter fun, activity, beauty and interest.

Embracing the Outdoors

The following section provides design guidelines and recommendations to enhance and embrace our experience outdoors in the wintertime. It speaks to the interrelated components of outdoor winter design and planning, site design and winter infrastructure.

All Edmonton parks, squares and open spaces should be high-quality, attractive and durable for all seasons. Quality public spaces that are animated and delightful year-round support meaningful social interaction — they even improve physical and mental health.

PARKS BREATHE LIFE AND SUSTAINABILITY INTO AN ACTIVE EDMONTON

Parks are complex elements of a city. They can serve scores of different users, may be specialized in their function, and can simply provide visual appeal for residents. However they work, parks act to define the shape and feel of a city and its neighbourhoods. They also function as a conscious tool for revitalization.

– City of Edmonton Urban Parks Management Plan

2.3 Site Design

Open Spaces Outcome 3:

Parks and open spaces are used and enjoyed year-round.

Rationale:

Parks and open spaces vary greatly in size, form and function across Edmonton. The landscape and design of all of the city's public parks and open spaces should be attractive, of high quality and durable for all seasons. Quality spaces available throughout the city can help support social interaction in a meaningful way. There are many different kinds of public and private spaces in a city that provide gathering places for residents, and contribute to a sense of community. A quality public space is welcoming and accessible, gives people a reason to visit, and provides a sense of safety and comfort that will encourage them to linger.

A busy day on a toboggan hill

2.3.1 Site Planning and Design

A. Design our parks and open spaces for a multigenerational and multicultural population. Special attention must be given to making spaces completely accessible for all users in the wintertime.

B. Consider the distribution of events and activities throughout the year, who is participating, and how to optimally design and arrange available spaces.

C. Identify alternate uses for community gardens, outdoor pools, dry ponds and spray parks during the winter months at early stages of planning.

D. Look for opportunities to develop winter activity hubs in geographic quadrants of the city and in the river valley. For example, tobogganing hills, skating areas, cross-country ski loops and servicing for facilities.

E. Block prevailing winds and create sun traps with structures or landscaping, so that outdoor spaces will feel warmer and be usable throughout the year.

F. Maximize solar access onto play and seating areas in order to improve comfort in winter conditions. Reduce shadows cast from schools, facilities and buildings over playgrounds and adjacent seating areas.

G. Place glazing and openings in buildings to face an outdoor activity area to allow for interaction, supervision and observation.

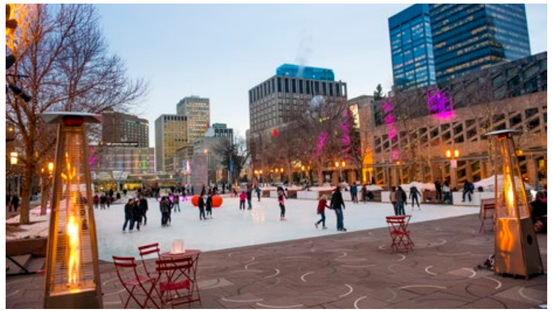
Pick up shinny in a community league rink in Edmonton, AB

Aerial view of illuminated ice town in Sokolniki Park, Moscow, Russia

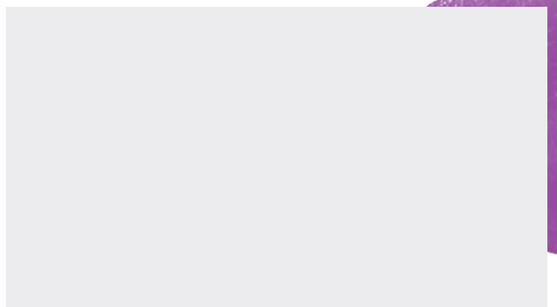
H. Look for opportunities to keep clean, uncontaminated snow on site, so that it can be used for play.

I. Account for spring run-off from snow storage areas in the site's drainage plan. Ensure that snow storage and contaminants (i.e. salt, ice melters, sand and soot) drain away from creeks, rivers and natural areas.

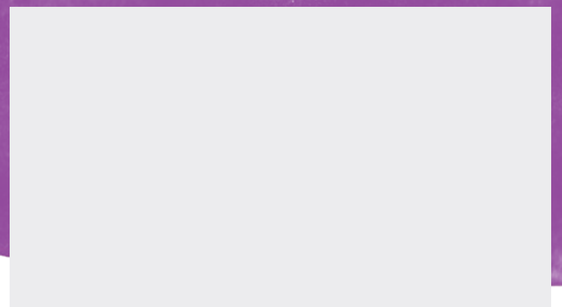
J. Refer to Section A of this document for more guidelines around site planning of buildings, walkways and open spaces, in particular for interfaces between the built form and parks, open spaces, shared use paths and furnishings.



Civic Plaza outside City Hall in Edmonton, AB



Ice skating loop at the Meadows Recreation Centre in Edmonton, AB



A snowy High Line Park receives plenty of sunshine and visitors in New York City, USA

PARKS BREATHE LIFE AND SUSTAINABILITY INTO AN ACTIVE EDMONTON

Parks are complex elements of a city. They can serve scores of different users, may be specialized in their function, and can simply provide visual appeal for residents. However they work, parks act to define the shape and feel of a city and its neighbourhoods. They also function as a conscious tool for revitalization.

– City of Edmonton Urban Parks Management Plan

2.3.2 Landscape Design, Planting and Vegetation

A. Use grass mounds, berms and vegetation to define spaces and block winds.

B. Use grass mounds and berms to create tobogganing areas.

C. Create outdoor rooms using trees and vegetation to shelter areas from prevailing winds. Dense coniferous vegetation on an area's north-west side will help to block wind, while an open southern exposure will maximize solar access, warming the area.

D. Use the natural topography and playground elements to create a hub of winter activity for the surrounding community. For example, slopes and hills for tobogganing, flat fields for snow furrows, snow sculptures and fort buildings, and pathways for running and sliding between garden beds.

E. Consider using landscape lighting, especially solar powered options, to light up walkways and select trees.

F. Use landscaping to stop snow from drifting onto public walkways or trails. Berms and vegetation can also help to direct snow drifts away from building entrances, reducing the frequency of snow removal.

▲ *Dense trees and homes block northwesterly winds from a south-facing park slope*

▲ *Clusters of trees support a more comfortable play space*

G. Use living snow fences, such as trees, plants and shrubs, to protect shared use paths and seating areas from blowing and drifting snow. These vegetative wind blocks are easier to maintain and have a longer life than snow fences and other man-made wind blocks. Plantings can also cause snow to drift, which may or may not be desired in a park setting.

H. Select plant species that offer attractive or useful winter characteristics such as colour, fruit or tolerance to salt. Choose native or non-invasive species that will create interesting landscapes year-round, including tall grasses and hardy greens. Trees that have colourful bark or retain their fruit in winter will attract winter birds and add additional colour and texture.

I. Consider the use of temporary winter elements in spaces where annual flowers are planted in summer.

J. Select appropriate landscaping for snow-storage areas. Grassed or landscaped areas that are used for snow storage are subject to damage and poor growth due to compaction and pollutants, and possibly poor drainage.

K. Balance winter considerations for sun and wind with summer considerations, like summer breezes, urban heat island effects, shade and westerly sun exposure. In light of climate change, monitor changes in plant communities.

Birds are the unsung heroes of winter gardens, adding beauty and life

Colourful bark and leaves provide contrast to white and gray

2.3.3 Pathways and Access

A. Design walkways and pathways with clear and direct routes, anticipating desire lines to reduce exposure to elements on extremely cold days.

B. Locate park and pedestrian pathways on the sunny side of streets and buildings, if they are only to be on one side.

C. Consider a variety of users, ages and physical abilities early in the design process, particularly for access routes throughout park spaces. Provide handrails for all public walkways on slopes, especially where visitors, residents or patrons may have mobility challenges.

D. Ensure that snowmelt run-off drains away from pathways into order to prevent hazards due to freeze-thaw cycles.

E. See Section 2.3.2 for guidelines about snow drifting onto walkways and building entrances.

DESIRE LINES

Informal desire lines are paths that pedestrians and cyclists take naturally, instead of using a sidewalk or set route. They tend to be well-worn paths with compacted snow or exposed dirt across a patch of grass. Desire lines are not cleared for winter use and can damage fields and vegetation.

Compacted snow on a walkway in an urban park

Deciduous trees along the south edge of the park allows for more winter sunlight. The wooden benches are south-facing, and the path provides users with a direct route

2.3.4 Recreation

A. Develop methods to adapt existing park features for winter activities, such as ice skating, skiing, tobogganing and snow tubing.

B. Situate activities in close proximity to retail locations whenever possible, to provide opportunities for warm-up breaks, and to contribute to the local economy.

C. Allocate suitable areas in parks and in the river valley for temporary, unique and playful exhibits, such as ice sculptures, ice castles, snow benches and designs in the snow.

A winter cyclist and a tobogganer enjoying a beautiful, sunny winter day

Using snow as a resource for play and art

Skating rink surrounded by warming huts and market stalls in Zagreb, Croatia

2.4 Winter Infrastructure

Open Spaces Outcome 4:

Public spaces support outdoor winter programming, recreation and everyday winter life.

Rationale:

The right infrastructure can help to create vibrant winter places that encourage and enable people to gather and be outdoors longer. Infrastructure, creative furnishings and art can bring people together, provide visual interest, illumination and weather protection.

A public meeting place that is comfortable and delightful has the power to energize and animate our city. It can serve as an informal gathering place and encourage social interaction. The physical and social activities that take place in our public spaces contribute to improved physical and mental health year-round, as well as increased community identity and pride.

A family tries snowshoeing for the first time in Edmonton, AB

2.4.1 Shared-use Paths and Open Space Connections

A. Identify, prioritize and clear shared-use paths of snow and ice for walkers, runners and cyclists with a focus on routes used by active transportation commuters.

B. Design parallel networks for cross-country skiers, snowshoers and kick-sled users. Ensure appropriate grooming (track-set or compacted) to accommodate different snow sports.

C. Look for opportunities to increase connectivity between groomed cross-country ski trails in order to create a more complete network and to support active transportation.

Friends pushing each other on kick-sleds

Skiers outside a warming hut

ACTIVE TRANSPORTATION - CYCLING

Separated bike lanes are the best infrastructure to support year-round cycling. And the best argument for separated bike lanes? Winter.

WINTER EVENTS HAVE DIFFERENT NEEDS

We know from winter festival producers that winter events require special infrastructure. Including lighting, fire and heating infrastructure in the design of public spaces will make animating our spaces in winter much easier.

MANAGING RISK

Many winter activities have higher risks associated with them due to the likely presence of ice and snow. The City of Edmonton is encouraging a culture of shared responsibility.

D. Incorporate trails from recreation areas and associated equipment storage facilities into overall transportation network.

E. Provide lighting and clear wayfinding signage along priority trails (those used for commuting). Consider educational signage for trail etiquette that will discourage other users from damaging groomed trails.

F. Develop an open source winter circuit map to establish high use routes.

G. Designate suitable areas for kiosks to sell hot drinks and food to commuters and recreational trail users in order to create destinations and to attract people.

H. Consult with community partners when designing new trails to understand the variety of potential users and preferences.

A gazebo placed in the middle of an ice rink

International Ice and Snow Sculpture Festival in Harbin, China

2.4.2 Shelters and Structures

A. Design shelters that provide protection from the elements, and include passive solar design and warm materials for seating and lighting. To absorb and radiate heat over a longer period of time, use dark colours over light ones.

B. Provide shelters or wind blocks in areas that serve as outdoor gathering spaces, particularly where transit stops are located. Design destination nodes around the city with services for sheltered cafés.

C. Install warming huts and winterized public washrooms along trails and in park sites to give users spots to rest or enjoy lunch, while also providing weather protection.

HyggeHouse, one of five 2013 winners of Warming Huts: An Art + Architecture Competition on Ice in Winnipeg, MB

Warming hut design competition entry in Edmonton, AB

Winter market huts, designed by Arthouse Residential, in Edmonton, AB

Skis outside the Winter Chalet sponsored by EPCOR in Edmonton, AB

D. Consider the day and evening functions of the area where the shelter will be located, as well as any specific needs, such as lighting or electricity.

E. Look for opportunities to use reflective surfaces, such as mirrors, in places with no direct solar access.

F. Incorporate views to the outdoors in small warm-up areas, such as in a vestibule within public washroom facilities. Design public areas to allow for outdoor-indoor interactions, so that people who are outdoors can see and gesture to those who stay indoors.

G. Create unique, protected areas with moveable walls, baffles or landscape planters that can be reconfigured to different spaces.

2.4.3 Signage

A. Include information about up-coming winter activities, events and uses on park signage.

B. Include colorful wayfinding information on park banners to celebrate winter. Clearly mark active transportation routes (cycling, skiing and walking/running) that are priority for snow grooming and clearing routes to support safer and more enjoyable navigation.

C. Consider opportunities for signage that also provides wind and weather protection; for example, fabric banners.

D. Post trail etiquette and directional signage to encourage trail users to respect groomed trails for cross-country skiing. Advise that foot, paw and bicycle prints damage ski tracks.

Skate rental entrance sign in Chicago, USA

Trail information post in Fort Collins, USA

Examples of signage for winter activities

2.4.4 Furniture

A. Orient seating and gathering places in public spaces to maximize sunlight and offer some wind protection. Consider comfort in all four seasons.

B. Choose materials that are warmer and more comfortable in winter. For example, wood is warmer than metal, which can get very cold or hot. Materials should also be durable, comfortable, colourful and aesthetically pleasing.

C. Position benches and cluster seating near shrubs and coniferous trees, where possible, for protection from the winter weather.

D. Provide benches and tables that are moveable, so people may choose to group with others or sit alone. This also allows visitors to respond to different weather conditions.

E. Place seating, shelter and rest areas along trails and adjacent to play spaces.

F. Create an iconic Edmonton winter symbol that can be used on railings and furnishings; for example, a stylized snowflake.

Enjoying hot chocolate on a winter patio at City Hall in Edmonton, AB

A bench overlooking a tobogganing hill in Edmonton, AB

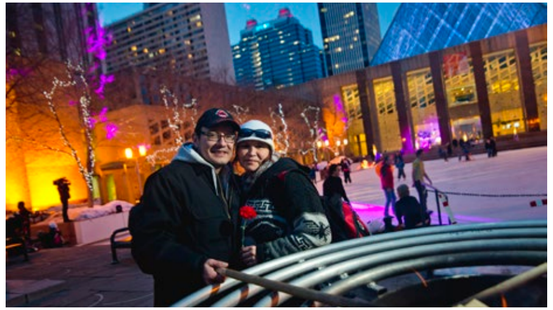
2.4.5 Other Infrastructure

A. Provide supporting infrastructure for outdoor rinks, including ovals, ice ribbons or skating pathways.

B. Provide safe public fire pits in gathering areas near skating rinks, other recreational activity areas and informal gathering places.

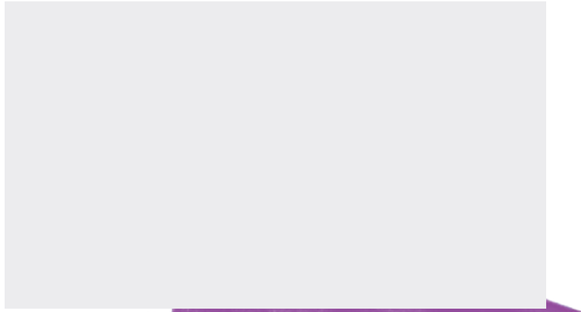
C. Consider outdoor heat lamps where supervised facilities exist; for example, an outdoor courtyard, patio or plaza.

D. Create spaces that encourage public events, such as outdoor winter markets, by providing electrical outlets, indoor washrooms and direct vehicle access on hard-surface paths (for vendors and performers). Electrical infrastructure should consider the high amp-load necessary for electric heaters for market vendor huts.



A couple warming up by a public fire pit outside City Hall in Edmonton, AB

Soft winter lighting at a skating oval with clubhouse in Montreal, QC



Food vendors on Churchill Square in Edmonton, AB

2.4.6 Lighting

A. Provide electrical infrastructure for the creative use of light. Refer to the Creative Lighting Master Plan.

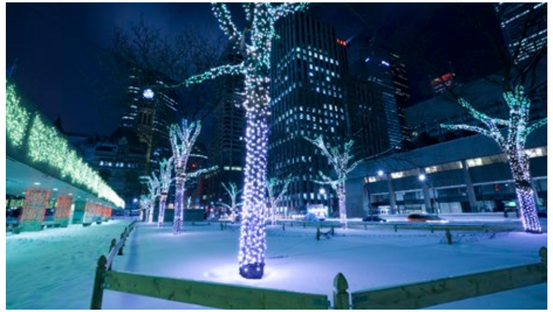
B. Establish and prioritize possible lighting of high-use parks and trails for nighttime use.

C. Use on-demand lighting to improve visibility when needed, and to preserve the natural state of an area when it is not in use.

D. Minimize light pollution and glare from all light fixtures, especially from community rink lights.

E. Consider ways to make use of summer park features, such as water spray parks or fountains, with a temporary lighting installation.

Low, soft ribbon of lighting in a neighbourhood park



Winter lights in a pocket park in Toronto, ON

A fountain with LED lighting in winter at Calgary City Hall in Calgary, AB

2.4.7 Public Art in Public Spaces

A. Provide opportunities for the installation of outdoor public art to provide colour and illumination in public spaces.

B. Support and encourage the incorporation of functional public art in high pedestrian traffic areas that may provide seating and weather protection.

Vaulted Willow, by Marc Fornes & THEVERYMANY, in Edmonton, AB

Illuminated ice sculptures at Winterlude Festival in Ottawa, ON

Evian's Live young swings in New York City, USA

3
Next Steps: Implementation

3.1 City Regulations, Policies and Guidelines

These next steps relate City of Edmonton planning policies, guidelines and regulations that inform urban design and development.

Next Steps	Anticipated Time Horizon	Lead Sponsor
Revise Zoning Bylaw to support the Winter Design Principles outlined in this document	Short to medium term, 0-4 years. Ongoing	• Current Planning Branch
Revise and update the Urban Parks Management Plan	Short term, 1-2 years	• Urban Planning and Environment Branch
Revise and update Complete Streets Guidelines Review, and update Active Transportation Policy	Short term, 1-2 years	• Transportation Planning Branch
Revise and update TOD Guidelines	Medium term, 2-3 years	• Urban Planning and Environment Branch
Develop Creative Lighting Master Plan and Program	Short term, 1-2 years	• WinterCity Office and Advisory Council • Urban Planning and Environment Branch
Require adherence for City of Edmonton development and redevelopment	Short term	• WinterCity Office • Current Planning Branch

3.2 City Development Standards

These next steps relate to City of Edmonton engineering, construction and design standards.

Next Steps	Anticipated Time Horizon	Lead Sponsor
Revise and update Roadways Design and Construction Standards	Short term, 1-2 years	• Roads Design and Construction Branch
Revise and update Landscape Design and Construction Standards	Short term, 1-2 years	• Facility and Landscape Infrastructure Branch
Revise and update lighting standards	Short to medium term, 1-4 years	• Roads Design and Construction Branch • Facility and Landscape Infrastructure Branch
Review and update maintenance and operations standards	Medium term, 2-4 years	• Transportation Operations Branch

3.3 Partnerships, Collaboration and Continuous Learning

These next steps relate to partnership and advocacy with other agencies, service providers, orders of government, governance bodies, and non-governmental organizations that have direct and indirect impacts on designing for winter; new recognition initiatives for pilot projects and innovative winter design; and, ongoing learning within the City of Edmonton administration, as well as outreach education to its partners and the public.

Next Steps	Anticipated Time Horizon	Lead Sponsor
Monitor application of, and collect feedback on, the Winter Design Guidelines	Short term, 1-2 years	• Current Planning Branch • Private industry and communities
Pilot a winter design project or installation	Short term. Ongoing	• Sustainable Development Department • Community Services Department
Develop a recognition program for developers whose projects (e.g. buildings and new communities) incorporate winter-friendly features	Short to medium term, 1-2 years	• Current Planning Branch • Urban Planning and Environment Branch

NEXT STEPS: IMPLEMENTATION
Partnerships, Collaboration and Continuous Learning

Next Steps	Anticipated Time Horizon	Lead Sponsor
Organize formal learning opportunities and symposia	Short term. Ongoing	• Current Planning Branch • Urban Planning and Environment Branch
Communicate with, and educate stakeholders about, the Winter Design Guidelines (e.g. e-learning modules and the City's Planning Academy)	Short term, 0-2 years. Ongoing	• Current Planning Branch • Urban Planning and Environment Branch • WinterCity Office and Advisory Council • University of Alberta • Grant MacEwan • NAIT
Produce brochures on leading winter design practices for the general public, community leagues, and general commercial owners/operators	Short term, 0-1 year. Ongoing	• WinterCity Office • Current Planning Branch