WINTER CITY DESIGN GUIDELINES

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1 Introduction: Winter and the Liveable City

The people of Fort St. John have long embraced their winter environment and celebrate the opportunities that northern living offers. The crisp, sunny days provide excellent opportunities for social interaction and outdoor activity. Often, incorporating Southern oriented planning methods fail to capitalize on these opportunities. Northern site planning and building techniques allow us to capitalize on these opportunities to stay outdoors, create lively streets and reinforce the vitality of the community.

Climate-sensitive design can create a more positive winter experience by adopting design strategies adapted to our northern environment. This booklet aims to present those strategies to citizens, planners, architects, engineers, and developers involved in the shaping of our community. It is a blueprint for a liveable winter city.

2 Winter Safety and Comfort

The goal of climate-sensitive design is not to create year-round summer conditions but instead to capitalise on unique northern opportunities by making the winter environment safe, comfortable, and enjoyable.

Many factors contribute to winter discomfort, including wind exposure, lack of sunlight, driven rain or snow, and spray projected by road vehicles. Slippery sidewalks become safety hazards for senior residents or those with impaired mobility.

Good site planning and well-designed buildings, streets, and parks reduce those factors and increase winter comfort. Well-used open spaces - such as main commercial streets or community parking lots - are prime candidates for climate-sensitive design.
3 Fort St-John’s Climate

The City of Fort St-John has been recognised as one of the sunniest communities in British Columbia. However, Fort St-John receives an average of approximately 76 hours of sunlight per month during the winter. Climate-sensitive design maximises solar exposure, especially in open spaces often used by people.

Throughout most of the year, Fort St-John has a mean temperature below the North American average. Climate-sensitive design reduces the impact of the wind and extends the period of comfort.

During the winter season, Fort St-John receives some measurable freezing precipitation one day out of three. Climate-sensitive design ensures that snow and rain accumulate where wanted or can be removed quickly and efficiently.

Fort St-John’s Average Solar Exposure
(Source: Environment Canada)

Fort St-John’s Average Temperature
(Source: Environment Canada)

Fort St-John’s Average Snowfall
(Source: Environment Canada)
4 Liveable Cities

Think of the city as a house: how it is built largely determines how safe, comfortable and enjoyable it is to live in. A liveable city is compact, mixes land uses and provides connected pedestrian places.

Compactness

A compact city uses space efficiently, allows people to walk between places, and ensures that streets and public open spaces are sheltered from the wind. Compactness can be achieved through higher density new developments or infill of existing urban areas.

Mix of Land Uses

Having housing, offices and stores in the same building or on the same street means less travel to accomplish daily activities. It also sustains street vitality throughout the day. Commercial downtown streets are often abandoned after working hours because nobody lives near them.

Connected Pedestrian Spaces

Urban open space is divided between cars and people. When no investment is made on people spaces - sidewalks, parks, etc. - the city becomes a place to drive through. Protect pedestrian spaces and design them so they can be used throughout the year. Connect them in a network so people can walk around the city.
5 Key Climate-Sensitive Principles

The following climate-sensitive principles apply equally to the design of individual sites or entire cities. From a climate perspective, they are the most important factors of urban liveability.

5.1 Preserve Solar Access

Shaded spaces are dead spaces. Pedestrian spaces should remain sunny throughout December 21st, when the sun is at its lowest. Locate taller buildings on the north side of streets or step them down to reduce the shaded area.

5.2 Shelter from the Wind

Winter winds make even sunny spaces unbearably cold. Tall, isolated, buildings increase wind speed at ground level. Instead, step buildings down and group them with others of similar height.

5.3 Design for Snow Storage and Removal

The strategic location of wind barriers and the provision of storage areas throughout the city reduce snow removal costs and increase safety.
**Wind Barriers**

Screens, buffers, and buildings can reduce wind speed by 50% on a distance equal to 4 to 10 times their height.

**Sunny Pockets**

Places sheltered from the wind and exposed to the sun feel much warmer and are usable for a longer part of the year.

**Building Height**

Buildings should be of similar height. Tall, isolated buildings increase wind speed at ground level.

**Location of Pedestrian Places**

Parks and main pathways should be located on the sunny side of streets and buildings.

**Shadows**

Buildings should not shade pedestrian places that are used in the wintertime.
6 Design Guidelines

6.1 Streets

Street trees reduce wind speed and provide separation between pedestrians and cars. Select salt-resistant species. Protect trunks from winter snow removal operations with temporary tree guards.

Seasonal feature lighting is one of the most effective ways to create a special winter atmosphere. Include electrical / sound outlets in street lampposts.

Continuous building façades with awnings, signage, and warm colours create visual interest and pedestrian scale. Add feature lighting.

Slightly-raised pedestrian street crossings slow traffic and eliminate curb-side accumulation of snow melt or ice formation.

Wider curb-side lanes allow for bicycles in the summer and temporary snow storage in the winter.

Pedestrian lighting and furniture increase comfort and safety. Streets become places for people.
6.2 Parks and Open Spaces

- Evergreen trees to block winter winds.
- Entrances to well-used buildings face park, with raised crosswalk for access.
- Grass mounds can be used for sleigh riding. Plant evergreen trees / removable fence on street side for safety.
- Amphitheatre becomes sheltered firepit in winter.
- Heated shelter w/toilets and dressing room. Houses park's mechanical and electrical facilities (pumps, irrigation controls, etc.). In large parks, include room for zamboni and ice clearing equipment.
- Lawns are used for snow storage. Snow mounds become play areas.
- Private parking lots can be shared with public for events.
- Sheltered transit stop in proximity to park.
- Lake can be used as skating rink. Landscape with temporary evergreens and lighting. Add music.
- Deciduous trees allow sun to reach areas of the park used in winter.
6.3 Homes and Commercial Buildings

- Evergreen trees to block winter winds.
- Deciduous trees allow sun exposure in winter.
- Site grading should slope away from house to avoid snowmelt infiltration into basement.
- Covered entrance and stairs are protected from snow and winds. Side entryway connects to driveway and reduces snow removal.
- Landscaping leaves room for piling snow. Terrain slopes towards drain.
- Building height similar to that of adjacent buildings to reduce downdrafts.
- South-facing setbacks are opportunities for comfortable pocket parks. Provide seating.
- Protected entrance with non-slippery surface draining away from building. Keep slope to a minimum. Provide lighting.
- Long side of house and windows facing south.
- Short driveways with room for piling snow. South exposure melts snow. In residential areas, locate sidewalks on south side of avenues to allow for snow storage on the north, and sidewalk on the east side of streets with storage on the west.
- Site grading should direct snowmelt away from roads or pedestrian areas to avoid icy conditions.
- Awnings, balconies and other façade projections reduce ground-level winds.
- Use dense materials to absorb / retain heat and lighter colours on south walls to reflect light.
6.4 Parking Lots

Divide the parking lot into smaller ones separated by planted islands. This makes it easier for people to find their car and reduces wind speeds.

Provide pedestrian pathways between parking lots and connect them to main entrances of buildings.

Put street-facing buildings along street frontage and at corners. Parking lot may remain visible but must be screened by vegetation.

Landmark feature at main entrance guides drivers.

Adequate snow storage should be developed to accommodate parking and walkway dimensions. Site should be designed to facilitate snow removal and equipment. Snow storage should be located in areas that maximise sunlight and melt.

Parking lot dividers

Provide room for pedestrian pathways and planted islands to serve as wind barriers. Dividers should be large enough to accommodate snow disposal. Raise them above parking level to reduce salt absorption from surface run-off and spray. Drainage and grading should direct water away from pedestrian and parking areas.
6.5 Trees and Plantation

The winter climate offers harsh living conditions for urban trees. To improve tree health, choose cold and salt-resistant species. Wherever practical, group trees together instead of planting them in rows.

**Planted Islands**

Grouping trees together improves their resistance to wind exposure and reduces surface evaporation. Trees also have more soil available for root development and water retention. Plan understory with salt-resistant shrubs and perennials. Raising the island reduces salt intake.

**Winter Protection**

Pieces of 2X4 lumber or recycled rubber matting strapped to the trunk protect trees against snow removal equipment.

**Planters**

Small planters are inadequate for most wintering plants and should be moved to wind-protected storage in winter. Large planters are adequate for hardy species and can double as street furniture.
7 Appropriate Colours, Materials, and Lighting

Because few plant species will retain interesting colours in winter, the choice of visually appealing materials and colours is found throughout Nordic cities. Some materials, such as brick, stone, and wood, have colours inherently compatible with the natural landscape. Many cities also promote colour schemes for buildings, signs, and street furniture, which serve as a guide for private constructions, renovations, or public infrastructures. When using colour, consider the following:

- Warm colours are usually more interesting in winter environments than cooler ones (blues and greens). Select earth tones (ochre, sand, and terracotta) and pastel hues, and keep brilliant colours (reds, oranges, and yellows) for accents.

- Special structures, such as bridges, are good opportunity to use colours. So are street lampposts and furniture.

- Colours can be temporary, such as banners.

- Evergreens, and certain plant species, offer interesting winter effect through bark colour, texture, or shape.

When selecting materials, consider the following:

- Wood, plastics, and certain composite materials stay comfortable for a longer period of the year than metal and concrete.

- Because of the risk of skin burns, metal may prove a hazard in certain situations, such as children playgrounds.

- Salt will corrode metal and porous concrete, brick, or stone.

Because of shorter days, lighting is an essential component of northern cities. Consider the following:

- Vehicular street cobra-head lighting provides safety but does not create a pleasant pedestrian atmosphere. On important commercial streets and parks, add pedestrian lighting and use the lamppost for attaching banners and speakers.

- Christmas lighting of commercial areas and skating rinks create a festive atmosphere.

- Lighted buildings, infrastructure or sculptures become focal points.
8 Selected Trees and Shrubs

When selecting a tree or shrub for northern use, consider the following:

a) Cold hardiness varies between species of a same plant. Check with local nurseries for species adapted to local climate. Plants grown locally have better chances of surviving transplantation than imported ones;

b) Plants near roads and parking lots should be salt-resistant (see plants with * below);

c) Before transplanting trees that have been in the nursery for a long time, mark the southern side of the trunk and plant with the same orientation.

8.1 Evergreen Trees

- Abies balsamea Balsam Fir
- Picea Sp. Spruces
- Pinus Sp. Pines

8.2 Evergreen Shrubs

- Juniperus Sp. Junipers
- Pinus mugo Mugo Pine

8.3 Deciduous Trees

- Acer ginnala* Amur maple
- Betula papyrifera* White Birch
- Malus Sp. Crabapples
- Populus Sp.* Aspens
- Prunus Sp.* Flowering Cherries
- Salix alba* White Willow
- Tilia amer. ‘Redmond’ Basswood

8.4 Deciduous Shrubs

- Amelanchier alnifolia Saskatoonberry
- Caragana arborescens Siberian Caragana
- Cornus Sp. Dogwoods
- Cotoneaster acutifolius Cotoneaster
- Eleagnus angustifolia* Russian Olive
- Lonicera Sp.* Honeysuckles
- Rosa rugosa* Ramanas Rose
- Salix Sp.* Willows
- Sambucus canadensis Golden Elder
- Shefardia argentea Buffalo Berry
- Syringa Sp.* Lilacs
- Viburnum Sp. Viburnums

8.5 Deciduous Evergreen Trees

- Larix laricina* Larch