

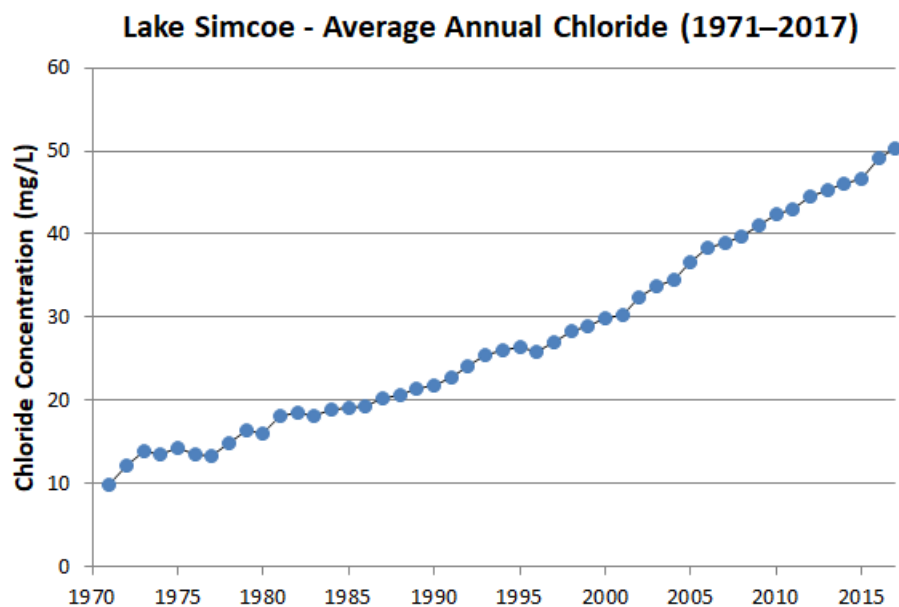
Parking Lot Design Guidelines

Municipal Policy Templates to Promote Salt Reduction in Parking Lots

Fact Sheet, June 2018



Chloride levels in Lake Simcoe, its rivers and streams as well as groundwater sources in the watershed have been steadily increasing in recent decades, and by 2120 will exceed the 120mg/l guideline.



The main source of this increase is salt used for winter maintenance of roads, sidewalks and parking lots. Generally, the highest chloride concentrations are found in more urbanized areas, where there are more paved surfaces requiring winter maintenance. Salt is widely used to combat snow and ice because it is a relatively inexpensive way to protect public safety and mitigate liability in winter conditions. However, it is often over-applied and excess salt gets washed into waterways, and ultimately into Lake Simcoe.



Impacts of increased chloride levels

Increased chloride levels in the environment can have negative impacts on human health, fish and wildlife, as well as our infrastructure. Based on field observations, concentrations flowing off commercial parking lots in our watershed can exceed 80,000 mg/L, which can then run off into local tributaries.

Did you know?

The concentration of chloride in seawater is 19,400 mg/L – we have seen water with over 4 times this amount flowing off of local parking lots and into our streams!

Let's design with winter in mind

If parking lots are designed with winter maintenance in mind, they can be built using features that intrinsically require less salt application to maintain the same level of service without increasing liability. A reduction in salt application is required to mitigate anticipated chloride increases in local watercourses as urban development continues.

To assist in the implementation of this goal, LSRCA and its partner agencies have developed 'Parking Lot Design Guidelines to Promote Salt Reduction'. These guidelines are intended for use by designers, regulatory agencies, owners, contractors, and others to consider winter maintenance in the design and layout of parking lots to reduce the amount of salt needed to achieve maintenance standards.

This factsheet was developed to assist municipal staff in incorporating these guidelines into their policies and review processes. This will then require property owners, site designers and contractors to implement the design guidelines when building new parking lots or upgrading existing infrastructure. This factsheet contains template policies and an overview of design features that can be considered in parking lot design to reduce salt application.

Design guidelines and features

The 'Parking Lot Design Guidelines to Promote Salt Reduction' document outlines four design features which, when implemented into parking lot design, can significantly reduce the need for winter salt application to achieve winter maintenance standards. The design features are summarized briefly below, and the guideline document (available [here](#)) contains drawings, design considerations, cost estimates and other additional information for each feature.

1. Effective grading and stormwater collection

- Ensure melting snow and ice is directed away from high traffic areas and does not travel far to a collection point.
- Grades of 2% to 4% are recommended to avoid the formation of depressions where ice can accumulate, requiring repeated salt applications.
- Direct downspouts away from paved surfaces (eg. towards bioretention features)



Poor grading in parking lots leads to ponding, which requires frequent salt application (left). Directing roof runoff to the stormwater collection system (centre) is a better management practice than allowing it to flow directly onto a paved surface, where it can freeze (right).

2. Snow pile storage location

- Locate piles downgradient from high traffic areas and close to stormwater collection points
- Avoid major wind patterns to minimize snow drift
- Clearly delineate snow pile location to avoid customer parking in that area



Snow piles melting across parking stalls to reach a catch basin requires frequent salt application to avoid ice formation (left). A better design is to place the snow pile directly upgradient from a catch basin or LID feature to minimize the distance meltwater has to travel to a collection point (centre). Placing snow piles along the perimeter of parking lots and clearly marking the area ensures that operators can always place snow in the best location (right).

Design guidelines and features continued

3. Sidewalk design and pedestrian flow

- Minimize the amount of unused walkways
- Build walkways wide enough for mechanical plowing and use slip-proof materials
- Where possible, use heated and/or covered walkways in high traffic areas (eg. entrances)



Unused paved pedestrian islands require frequent salt application, but with no benefit (left). These could be improved by planting grass or gardens instead. Covered walkways around building entrances can minimize salt requirements (right).

4. Landscaping Features

- Incorporate vegetated islands to minimize paved surfaces requiring salt application
- Use low-impact development features for stormwater collection, where feasible
- Use raised planters to protect vegetation from salt
- Plant evergreens along the perimeter to ensure snow drifts accumulate away from high traffic areas



Installing treed windbreaks along parking lot perimeters, while considering the predominant wind direction can minimize blowing snow across the parking lot and the amount of salt required (left). Raised planters protect vegetation from salt (right). Landscaping features in parking lots should consist of native and salt-tolerant species.

The guideline document describes how these design features can be used together when planning different types of site designs.

Template policies

In order to empower municipalities to implement these guidelines, the LSRCA has drafted template policies around the design of parking lots to reduce salt application which can easily be built into municipal planning documents. Policies specific to different planning tools have been developed and are presented below.

1.0 Official Plan and Secondary Plan Policies

1. The application of winter salt to manage ice and snow on paved surfaces, including parking lots, is a major contributor to increasing chloride levels in our watercourses. The Municipality supports the design of parking lots to minimize salt application through the development process as part of achieving environmental sustainability and protecting our water resources.
2. It is the policy of the Municipality to require a Salt Reduction Design Plan as a prerequisite to draft approval of a plan of subdivision or condominium and site plan approval. The detailed Salt Reduction Design Plan will be required as a condition of draft plan and site plan approval.
3. The detailed Salt Reduction Design Plan shall incorporate the design criteria outlined in **Parking Lot Design Guidelines to Promote Salt Reduction** (LSRCA, 2017), or other current applicable best management practices.
4. The detailed Salt Reduction Design Plan shall be prepared by a qualified professional, to the satisfaction of the Municipality in consultation with the LSRCA. The Salt Reduction Design Plan shall have regard for other development programs and policies including the LSRCA's Phosphorus Offset Policy.

2.0 Design Guidelines

2.1 Engineering Design Standards

Parking Area Design

1. The design of new or retrofitted parking lots shall consider winter maintenance and shall incorporate the design criteria outline in **Parking Lot Design Guidelines to Promote Salt Reduction** (LSRCA 2017), or other current applicable best management practices.

2.2 Urban Design Guidelines

Parking Area Design

1. The design of new or retrofitted parking lots shall consider winter maintenance and shall incorporate the design criteria outlined in **Parking Lot Design Guidelines to Promote Salt Reduction** (LSRCA, 2017), or other current applicable best management practices.

3.0 Recommended Conditions of Approval

3.1 Plan of Subdivision

1. That prior to final plan approval, a detailed Salt Reduction Design Plan shall be prepared to the satisfaction of the LSRCA and the Municipality, demonstrating that the design of all parking lots satisfies the criteria outline in the **Parking Lot Design Guidelines to Promote Salt Reduction** (LSRCA, 2017), or other current applicable best practices.
2. That the owner shall agree in the Subdivision Agreement to ensure that proper salt reduction measure will be in place in accordance with the approved Salt Reduction Design Plan and Landscape Place prior to any site alteration or grading.

3.2 Site Plan Agreements

1. That prior to execution of a Site Plan Agreement, a Salt Management Plan shall be prepared to the satisfaction of the LSRCA and the Municipality, demonstrating that the design of all parking lots satisfies the criteria outlined in the **Parking Lot Design Guidelines to Promote Salt Reduction** (LSRC, 2017), or other current applicable best management practices.
2. That prior to execution of a Site Plan Agreement, a Salt Management Plan shall be prepared by a qualified professional to the satisfaction of the LSRCA and the Municipality.
3. That the Owner shall agree in the Site Plan Agreement to ensure that proper salt reduction measure will be in place.

Implementation and next steps

When municipalities are updating their Official Plans, Secondary Plans, Urban Design Guidelines and Engineering Design Standards, and when developing Site Plan Agreements, the attached template policies should be adapted and incorporated, as appropriate. If required, Lake Simcoe Region Conservation Authority staff can be available to assist with this process and ensure that the goals of the policies are being implemented.

The 'Parking Lot Design Guidelines to Promote Salt Reduction' document, including example site plan drawings, design feature drawings and factsheets, are available for [download here](#). All drawings are available in both PDF and CAD formats.

For further information or assistance with the template policies, please contact Lake Simcoe Region Conservation Authority at info@lsrca.on.ca or 905-895-1281.



Established in 1951, the mission of Lake Simcoe Region Conservation Authority is to work with our community to protect and restore the Lake Simcoe Watershed by leading research, policy, and action. To learn more visit www.LSRCA.on.ca. 120 Bayview Parkway, Newmarket, ON L3Y 3W3 • 905-895-1281 • 1-800-465-0437

