



Bill Thompson

Lake Simcoe Region Conservation Authority

Speaker

*Parking Lot Design with Winter
Maintenance in Mind*



Parking lot design with winter maintenance in mind

2022 Salt Symposium

Aug 3, 2022

Bill Thompson and Pamela Strong



Lake Simcoe Region
conservation authority



What is a Conservation Authority?

- Local watershed management agencies
- Non-governmental, but work in close partnership
- Base funding from local government
- 36 across Ontario
- Diverse size and responsibilities: small to very large

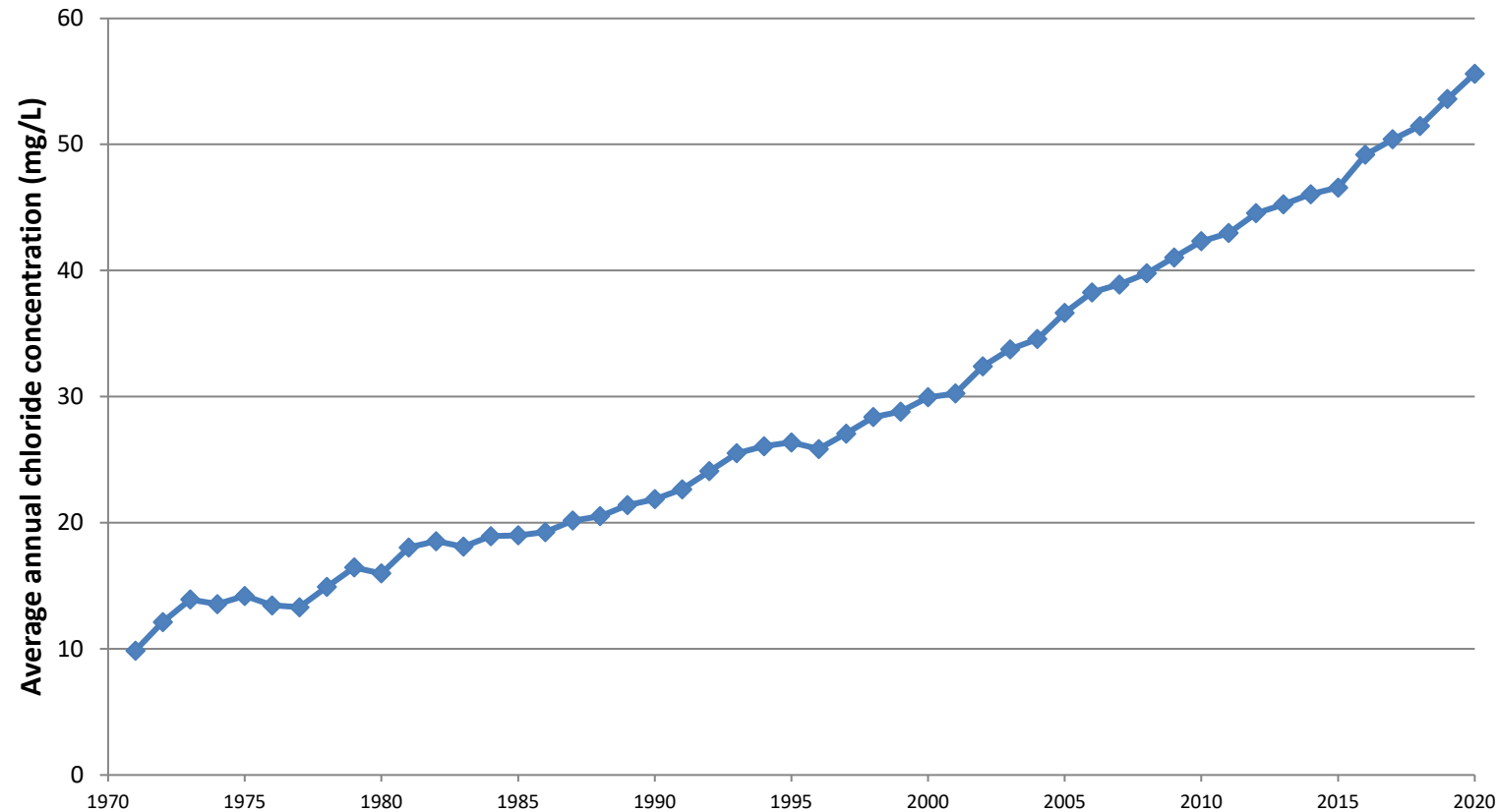


The Lake Simcoe watershed

- 3612 km² (1395 mi²) watershed
- 723 km² (280 mi²) lake
- Diverse land use
- 45 min. north of Toronto
- 400,000 people
- Experiencing rapid urban growth

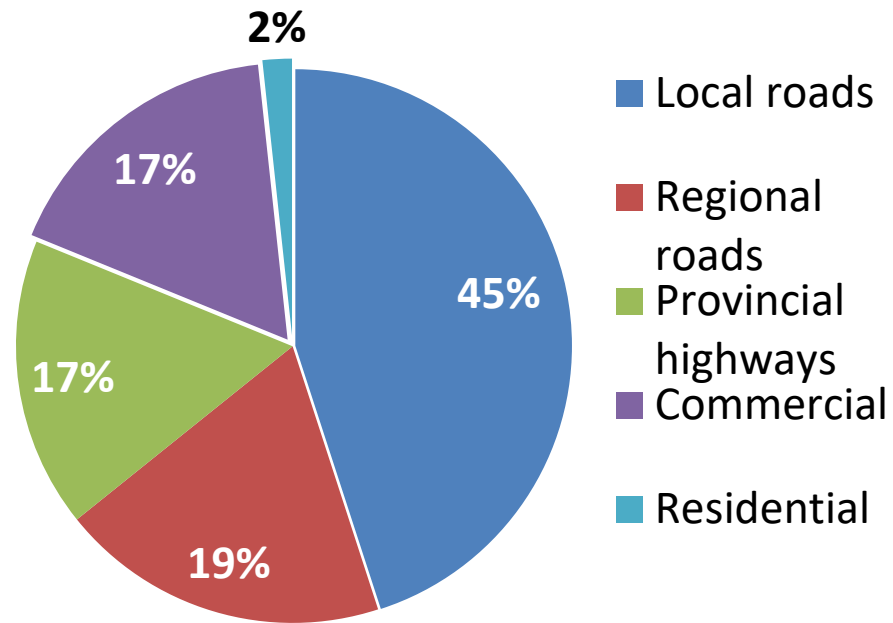


Lake Simcoe Chloride Trends

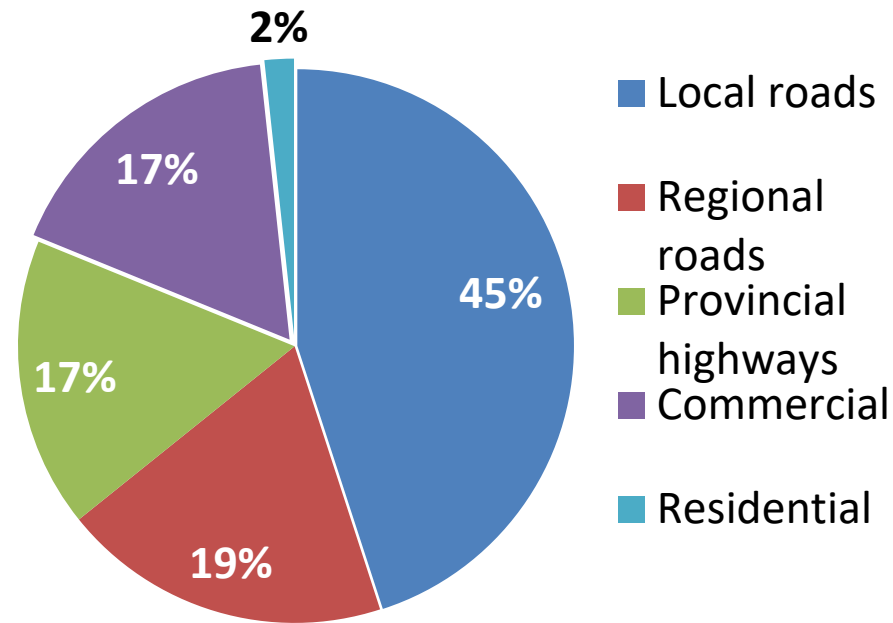


Concentrations have been increasing at a rate of 0.7mg/l/year (2020 = 55.6 mg/l)

Salt application in the Lake Simcoe watershed

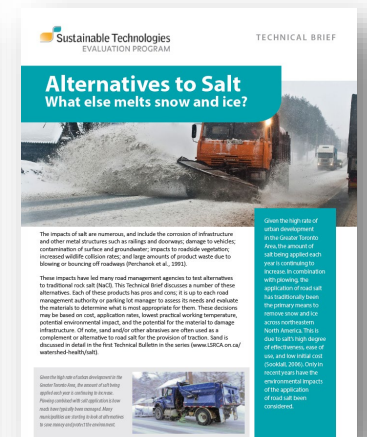


Salt application in the Lake Simcoe watershed



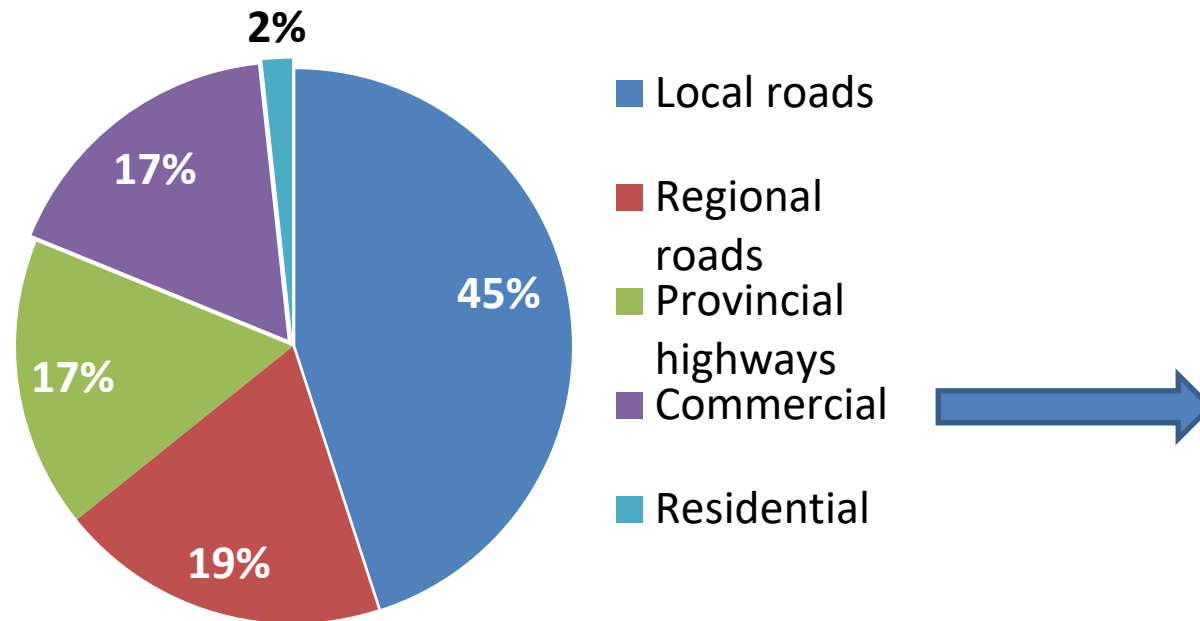
Lake Simcoe Road Salt working group

- Semi-annual meetings of municipal, provincial staff (roads managers, land use planners, drinking water risk managers)
- Share results of pilot studies
- Updates on current research
- Publish series of technical briefs



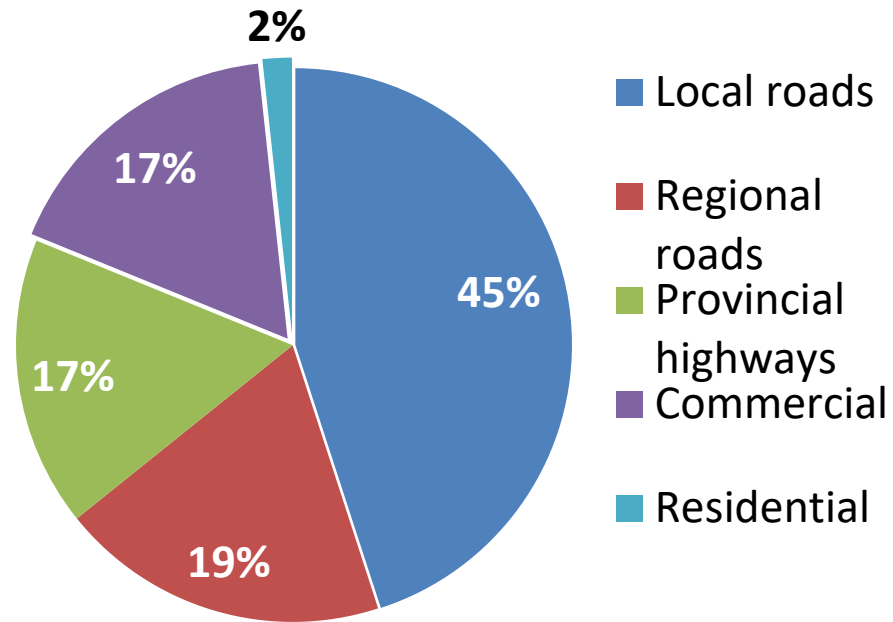
Salt application in the Lake Simcoe watershed

Freshwater Roundtable



- Working group of contractors, property owners / managers, environmental agencies
- Discuss barriers to adoption of best practices
- Advocating for change to Provincial liability laws

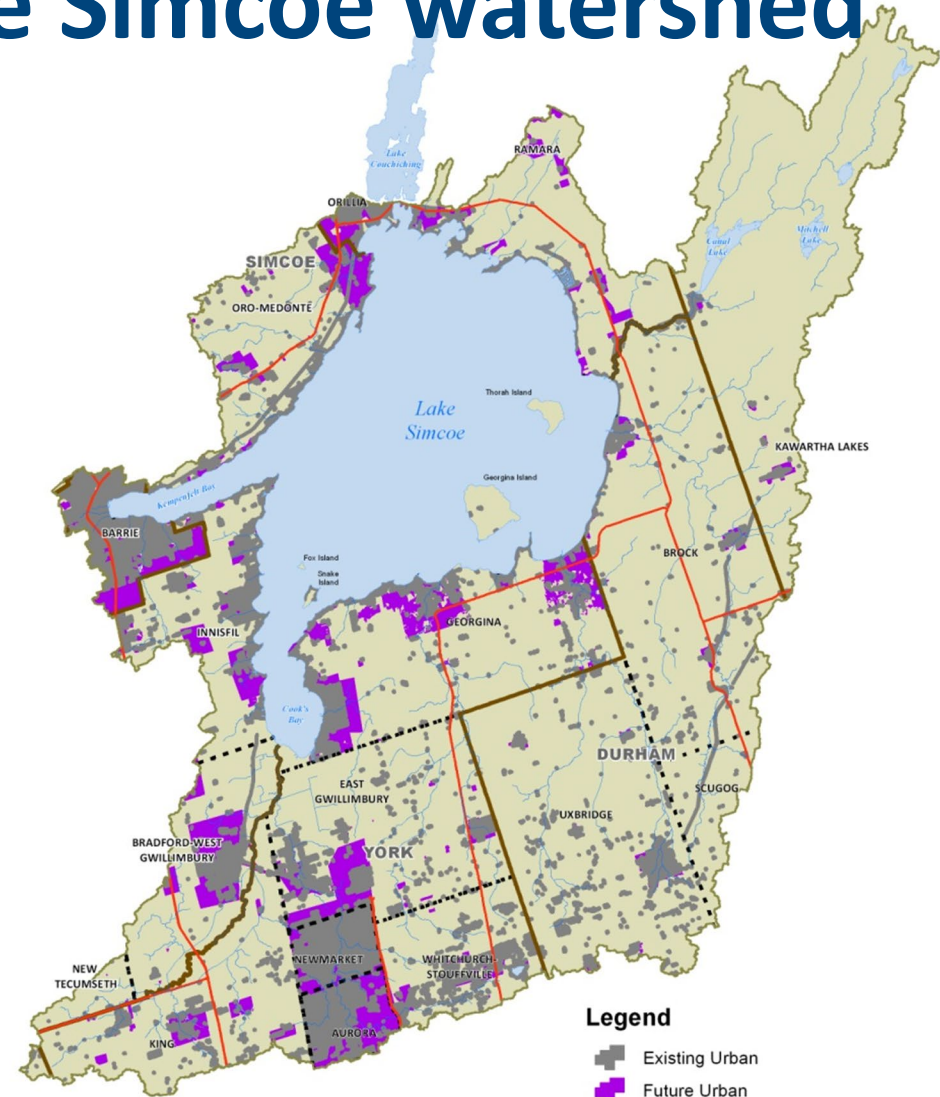
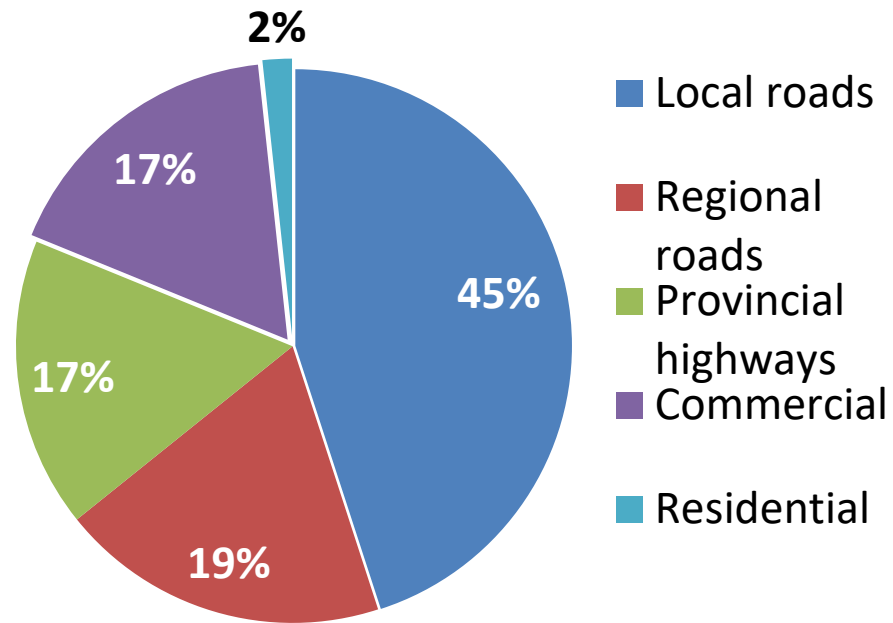
Salt application in the Lake Simcoe watershed



Ongoing research



Salt application in the Lake Simcoe watershed



Poor design, construction, maintenance lead to over application

Poor drainage and improper snow disposal



Unnecessary sidewalks



How do we build better?

Use site design to:

- Avoid problem areas that lead to oversalting
- Promote adoption of best practices
- Allow for easy / efficient plowing



Parking lot design guidelines

- Selected a short list of design elements through subject matter expert interviews in development industry, snow removal industry, municipal planning
- Drafted design feature detail drawings, fact sheets, example site design drawings



Parking Lot Design Guidelines to Promote Salt Reduction

Lake Simcoe Region Conservation Authority

GHD | 651 Colby Drive Waterloo Ontario N2V 1C2
11115623 | Report No 2 | February 22 2017

Charette



Review / refine drafts
with input from
development industry,
snow removal industry,
property managers

Parking lot design guidelines

Package consists of:

- Factsheets which provide an overview of each of four primary design features, their design considerations, pitfalls to avoid, estimated costs
- Detailed drawings for primary design features (CAD and pdf)
- Four example site plans, to show how they can be incorporated into different types / sizes of properties (CAD and pdf)



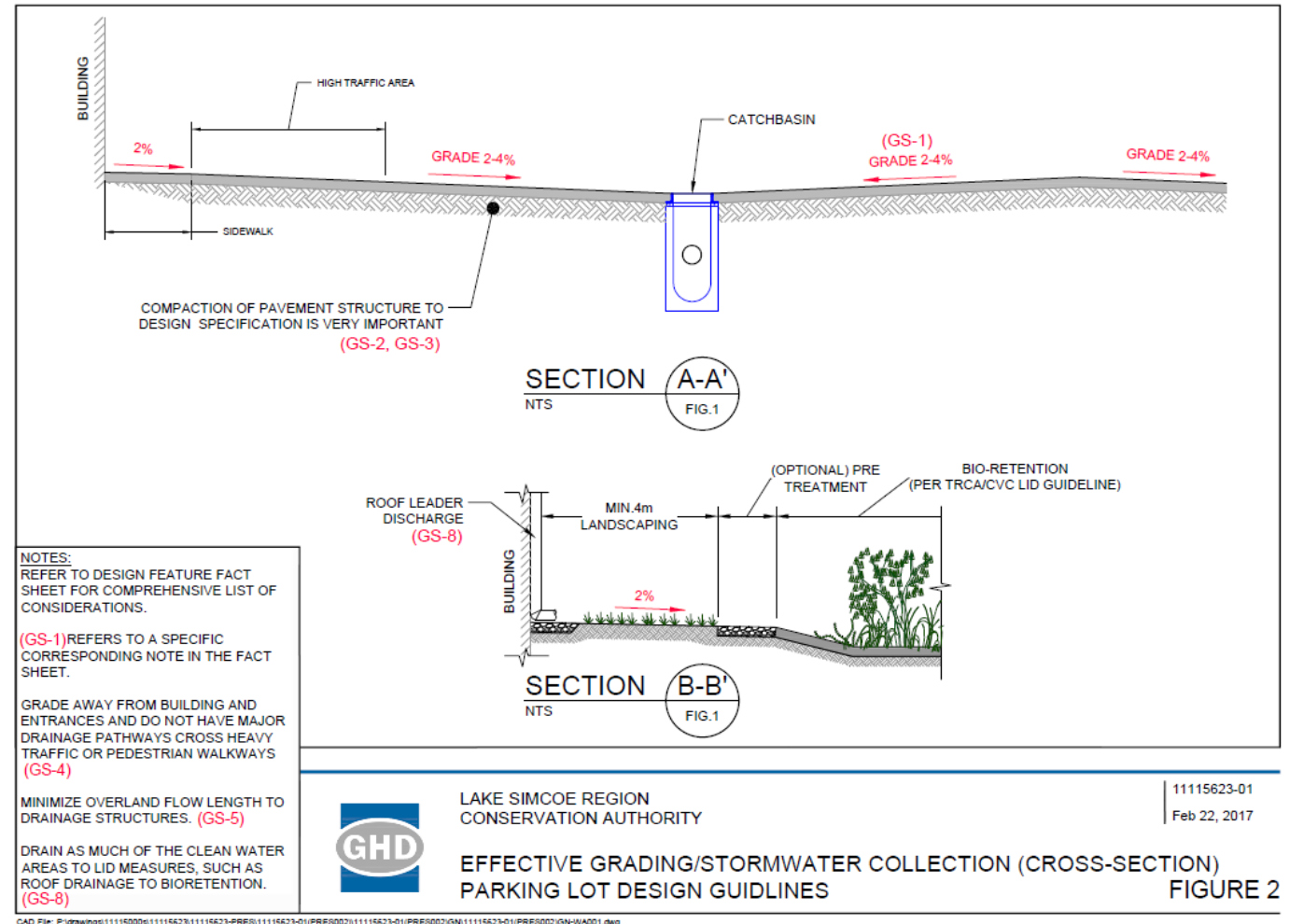
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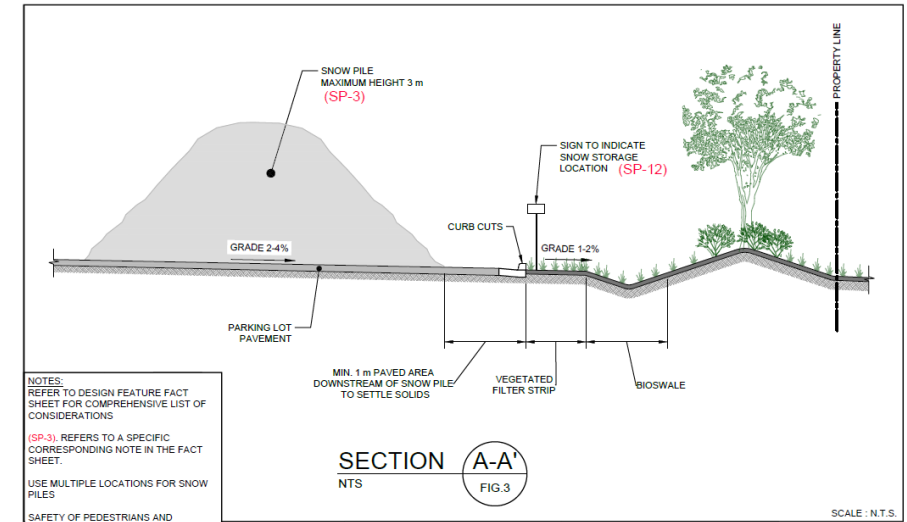
1. Effective grading and stormwater collection

- Use grades 2-4% to avoid ponding and refreezing
- Grade away from building entrances
- Minimize distance of meltwater to catchbasins
- Direct roof leaders towards pervious surfaces where possible or to stormwater collection system; never direct them onto paved surfaces



2. Snow pile storage location and design

- Place snow piles downgradient from parking lots, away from major pedestrian routes
- Place catchbasins immediately downgradient from snow piles
- Clearly mark the area with signage and / or painted pavement markings
- Where possible, dedicate several areas to snow piles, to allow flexibility for contractors



3. Sidewalk design and pedestrian flow

- Ensure sidewalks are direct and intuitive, and designed for main pedestrian routes only
- Minimize walkways where they aren't useful
- Minimize islands or replace with vegetation
- Ensure walkways are wide enough to accommodate snow plow machinery



4. Landscaping

- Give preference to vegetated islands over concrete to minimize areas requiring salt application
- Plant deciduous trees with high canopies to maximize solar energy to melt snow/ice
- Utilize salt-tolerant plants
- Consider using raised planters to protect vegetation from being exposed to increased salt



Template policies

- Developed with an ad hoc working group of municipal planners
- Example text for:
 - Municipal official plans
 - Municipal secondary plans
 - Engineering design standards
 - Urban design guidelines
 - Plans of subdivision



Lake Simcoe Region
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www.LSRCA.on.ca

June 2018

Template Municipal Policies Parking Lot Design to Reduce Salt Application

1.0 Introduction and Background

Chloride levels in Lake Simcoe and its tributaries have been steadily increasing in recent decades. Elevated chloride levels can negatively affect aquatic ecosystems and drinking water resources. A major source of this chloride is the application of winter salt to manage ice and snow on paved surfaces, including parking lots.

Designing parking lots while considering winter maintenance requirements allows them to be built using features that intrinsically require less salt application to maintain the same level of service without increasing liability. A reduction in winter salt application is required to mitigate anticipated chloride increases in local watercourses as urban development continues.

The following template policies were created for incorporation into municipal planning tools upon the next scheduled update. Implementation of these policies will help to achieve the goal of mitigating increased chloride levels in our water resources.

2.0 Official Plan and Secondary Plan Policies

- 2.1 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.
- 2.2 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.
- 2.3 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.
- 2.4 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 Phosphorous Offset Policy.

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Guideline adoption and next steps

Good uptake by watershed municipalities into planning policy

Will an opportunity arise to document benefits of parking lot design through a parking lot retrofit?



With thanks to

- Funding provided by Ontario Ministry of Environment, Conservation and Parks and LSRCA's member municipalities
- Andrew Betts and Dilan Singaraja at GHD
- Kaitlyn Read, Dave Lembcke and Chandler Eaves at Lake Simcoe Region Conservation Authority

Questions?

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Guideline package available at: <https://www.lsrca.on.ca/parking-lot-guidelines>