



**Credit Valley
Conservation**
inspired by nature

CVC's Head Office Salt Study

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CVC/Peel/TRCA Salt Workshop
September 14, 2023



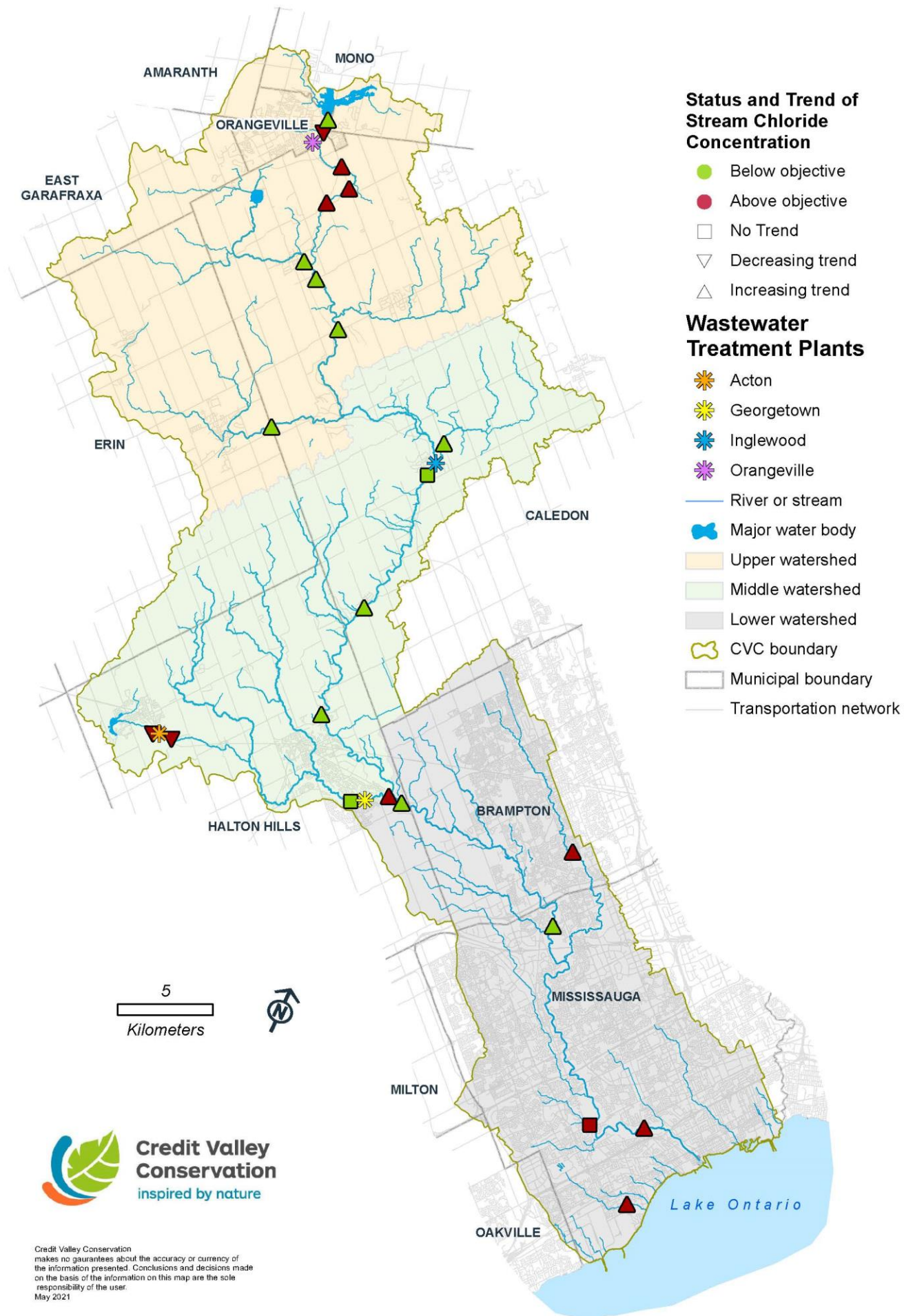


The Credit River Watershed

Chloride in our Watershed



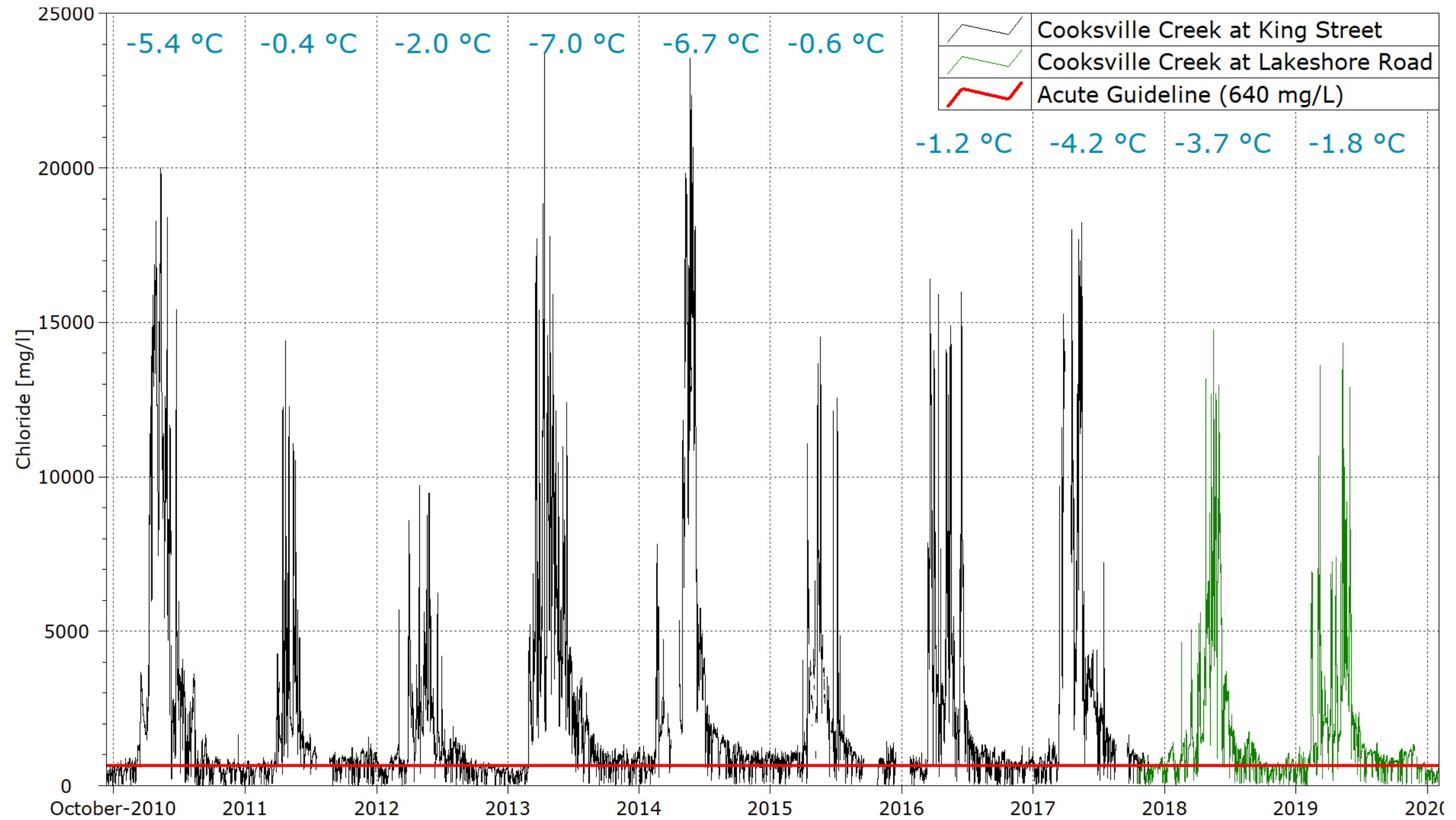
Chloride Trends



- Road salt = NaCl
- 23 sites
- Increasing at 17 sites
- Decreasing at 3 sites
- Stable at 3 sites
- Exceeds (75th percentile) chronic objective at 11 sites
- Urban areas



11 real-time water quality stations



Chloride in Cooksville Creek

Winter Maintenance 101



How Salt Works

- Needs moisture to work
- Brine spreads, melts more snow, forms more brine...
- Only works to about $-10\text{ }^{\circ}\text{C}$
- Additives (organic, other salts) can lower the effective working temperature



Best Practices: Brine/Liquids

- Salt water
- Kick starts melting process
- Less chloride
- Anti-icing: apply brine → snowfall → plow → salt (NaCl rock salt but much less!)
- Dilute brine with organic product like beet juice

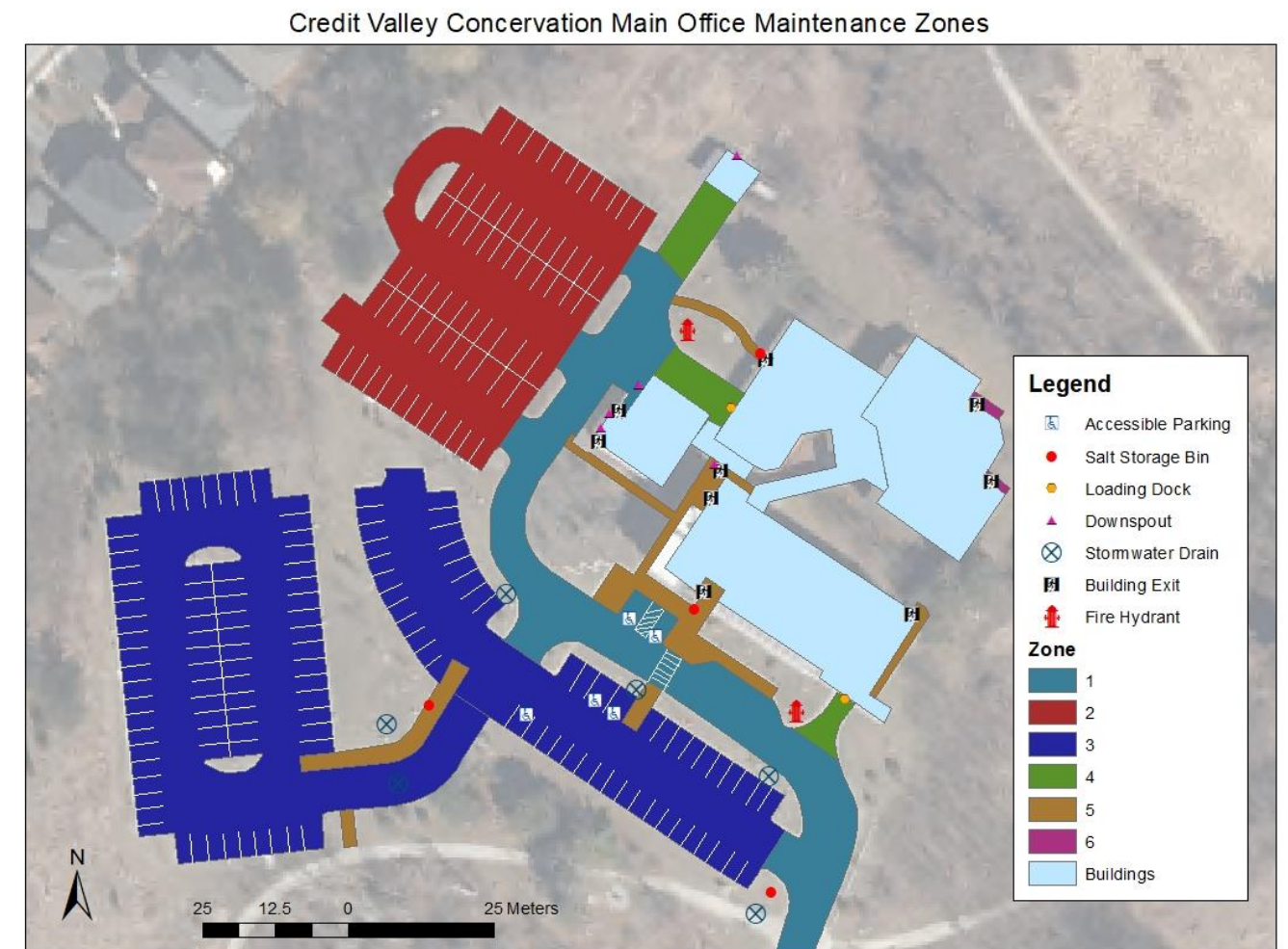


Head Office Salt Study



CVC Head Office Salt Management Plan

- Encourage liquids and anti-icing
- Do not use sand (can clog pavers)
- Liquids should not be used on permeable pavement?
- Excludes sidewalks



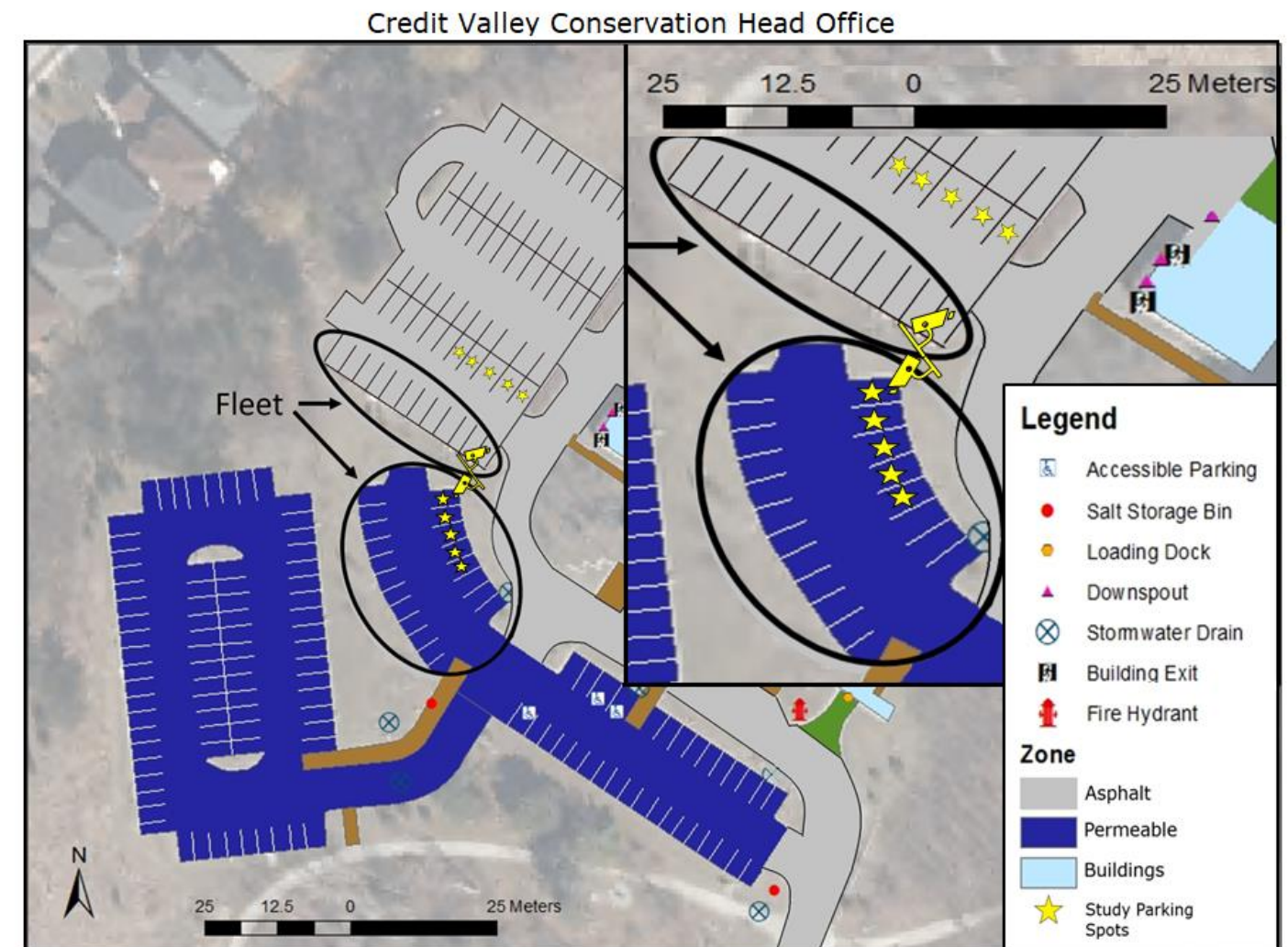
**How well is the salt
management plan
working (i.e., liquids)?**

**How effective are liquids
on permeable pavements?**

A decorative graphic of a green leaf with white veins, positioned in the bottom right corner of the slide.

Data Collection

- Parking lots:
 - Contractor salt application data – permeable and asphalt
 - Images from time lapse and security cameras
- Test plots:
 - Manually applied product and shoveled
 - Surface friction



Results – Parking Lots



February 3rd
6:16 am

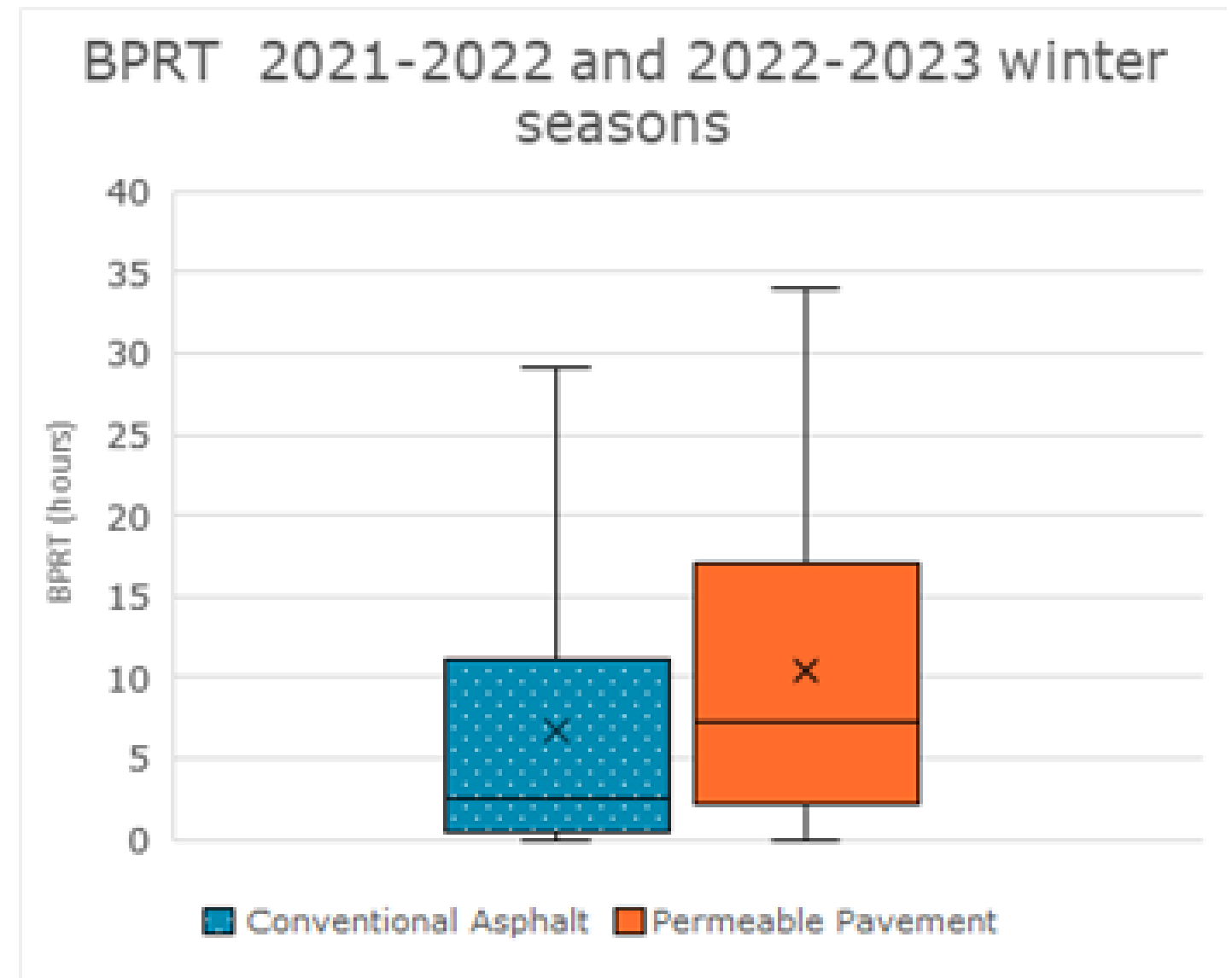




6:01 AM
02/18/2022

Bare Pavement Regain Time

- Image classification into 6 categories
- Asphalt is usually wetter
- Permeable has dry snow





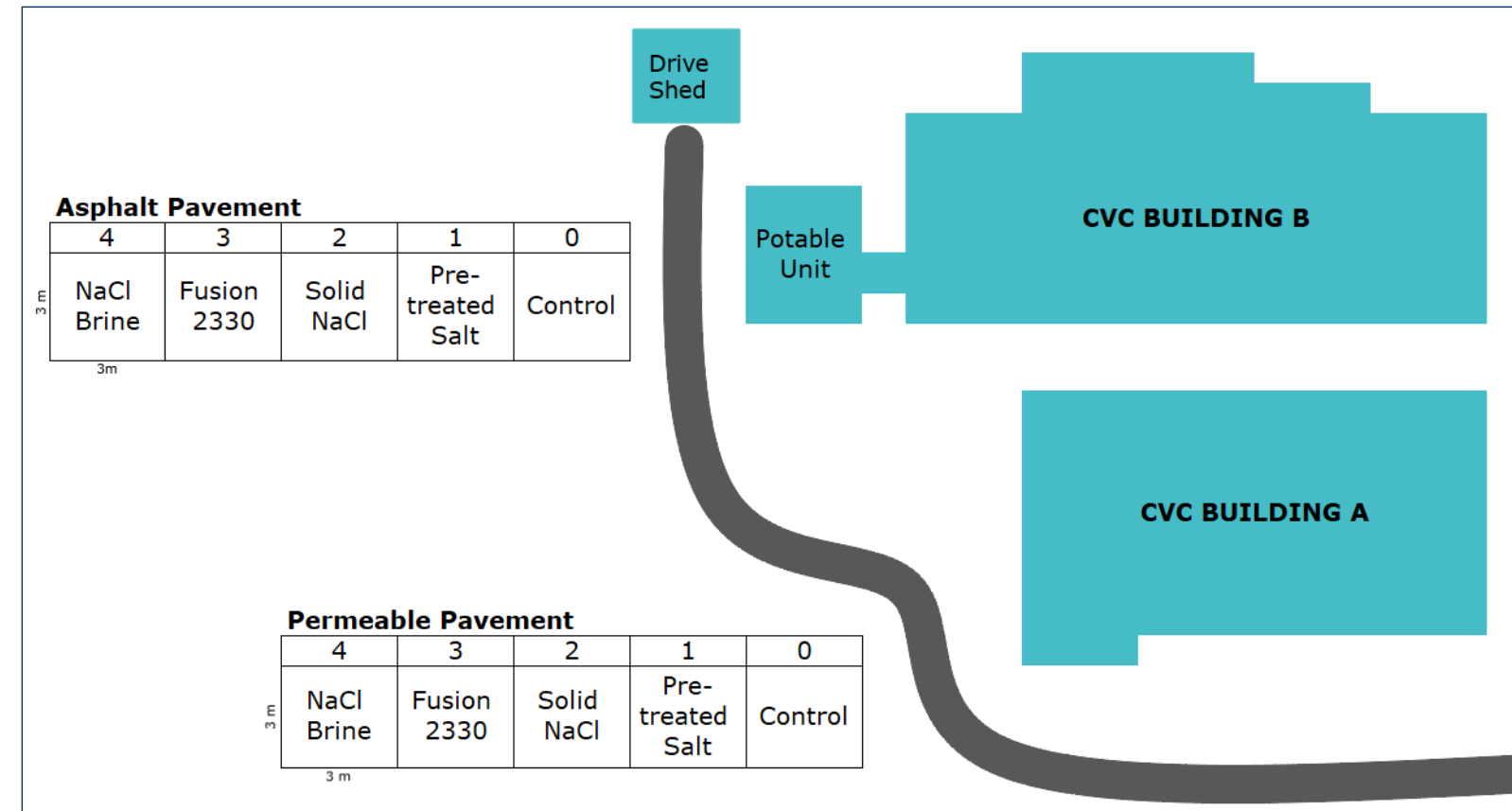
Melting Patterns: Asphalt vs. Permeable

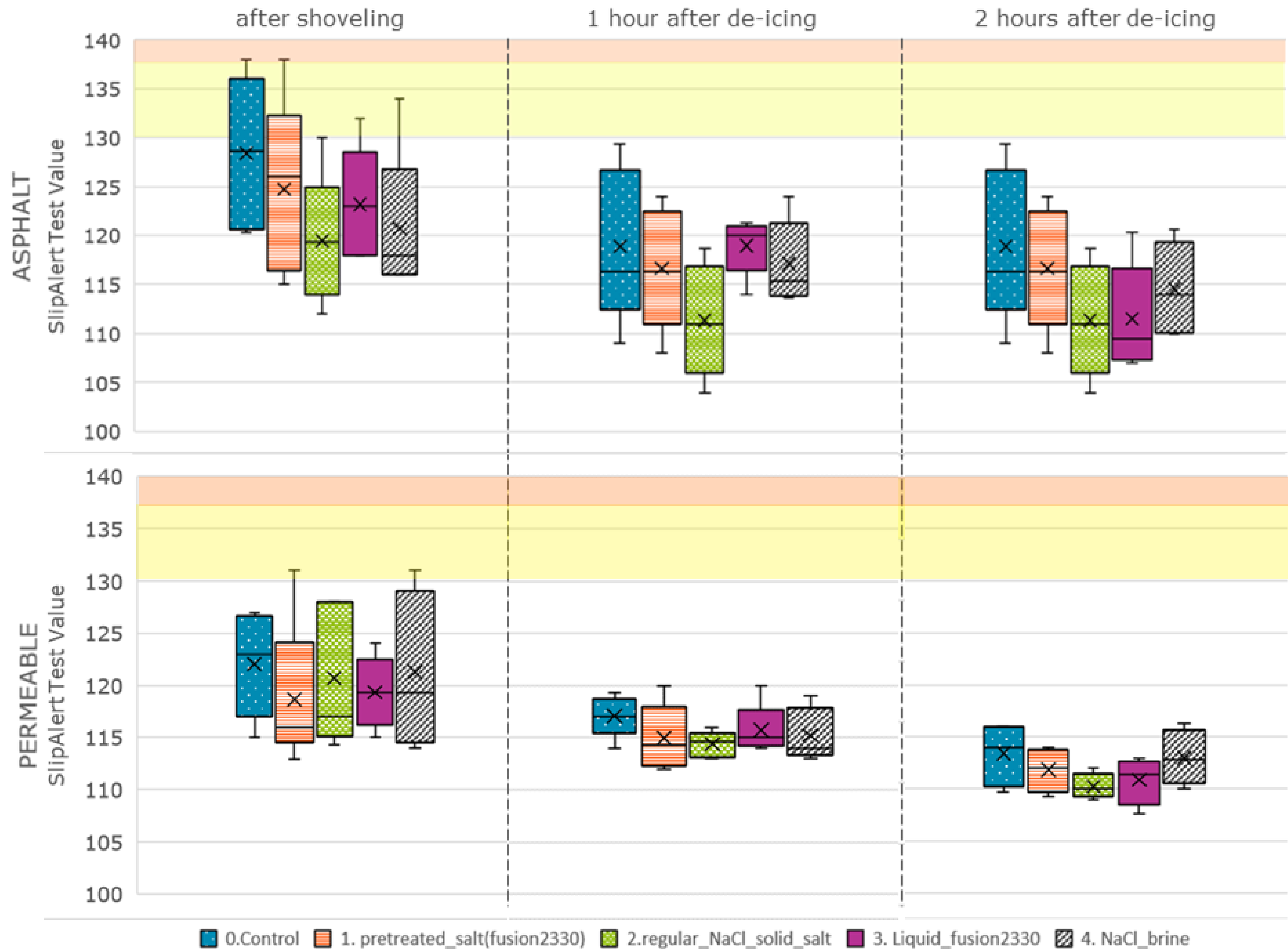
Results – Test Plots



Study Design

- 5 plots on permeable and asphalt
- 4 materials plus control
- Each plot received 1 material
 - Anti-icer
 - De-icer
- Cleared snow
- Measured friction at intervals







Conclusions

- Conventional asphalt had faster BPRT, but not necessarily faster friction regain time.
- Any product (solid or liquid) is less efficient on permeable pavement than asphalt, if bare pavement is the goal. Some product will always be lost to infiltration.
- Enough liquid remained on permeable surface to have an impact.
- Need better definition of level of service on permeable pavements, bare pavement should not be the goal.
- Salt application rates on permeable should be reduced due to residual.

inspired by nature



Gaps or Still to Come

- How much chloride is used by the contractor in the rock salt only vs. anti-icing with beet juice scenarios?
 - No comparable events; test plots use same application rate
- BPRT on the controlled plots
 - Images are classified, need to crunch the data
- Beet brine on asphalt vs. permeable (~4 events)
 - Analysis to come