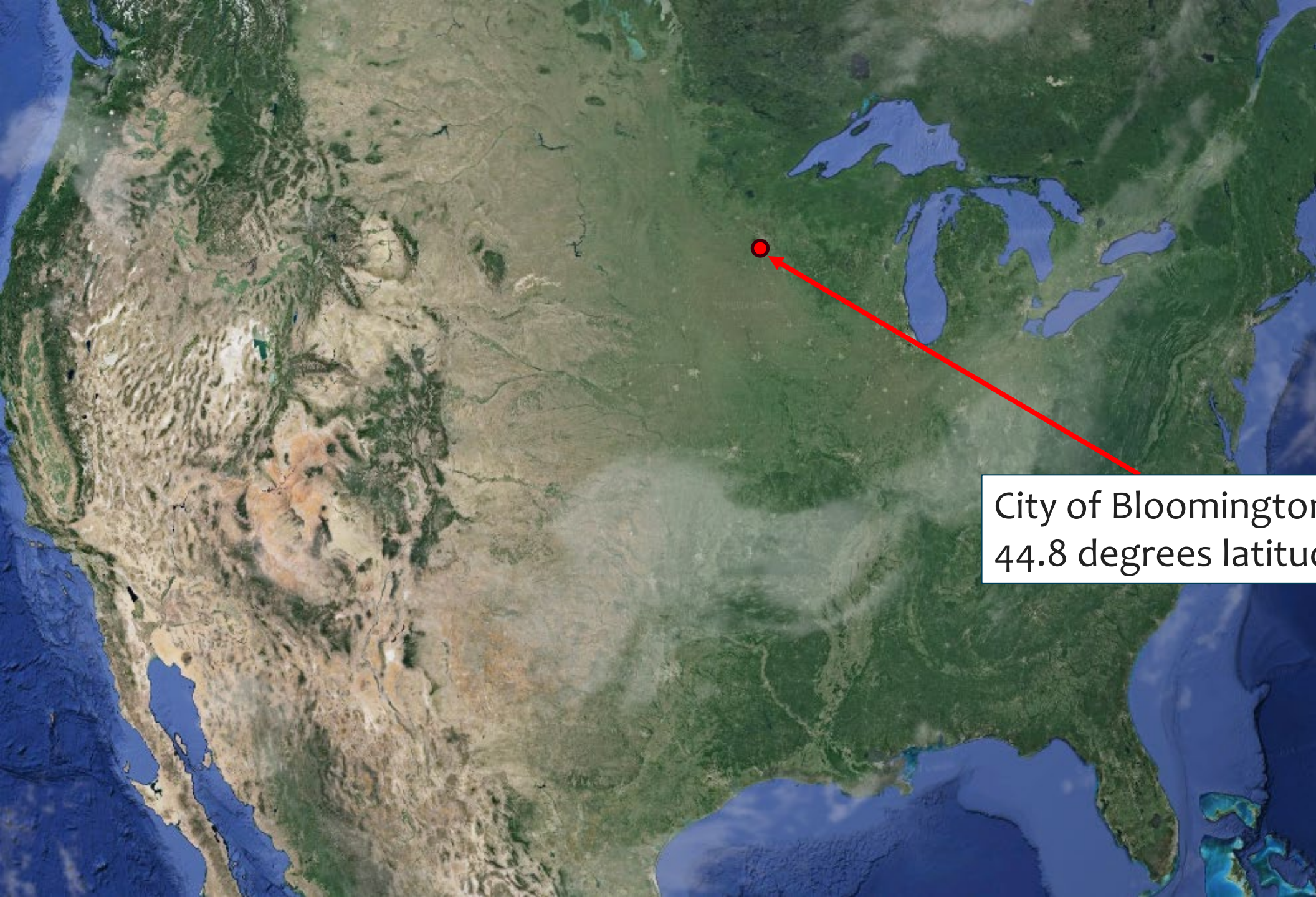




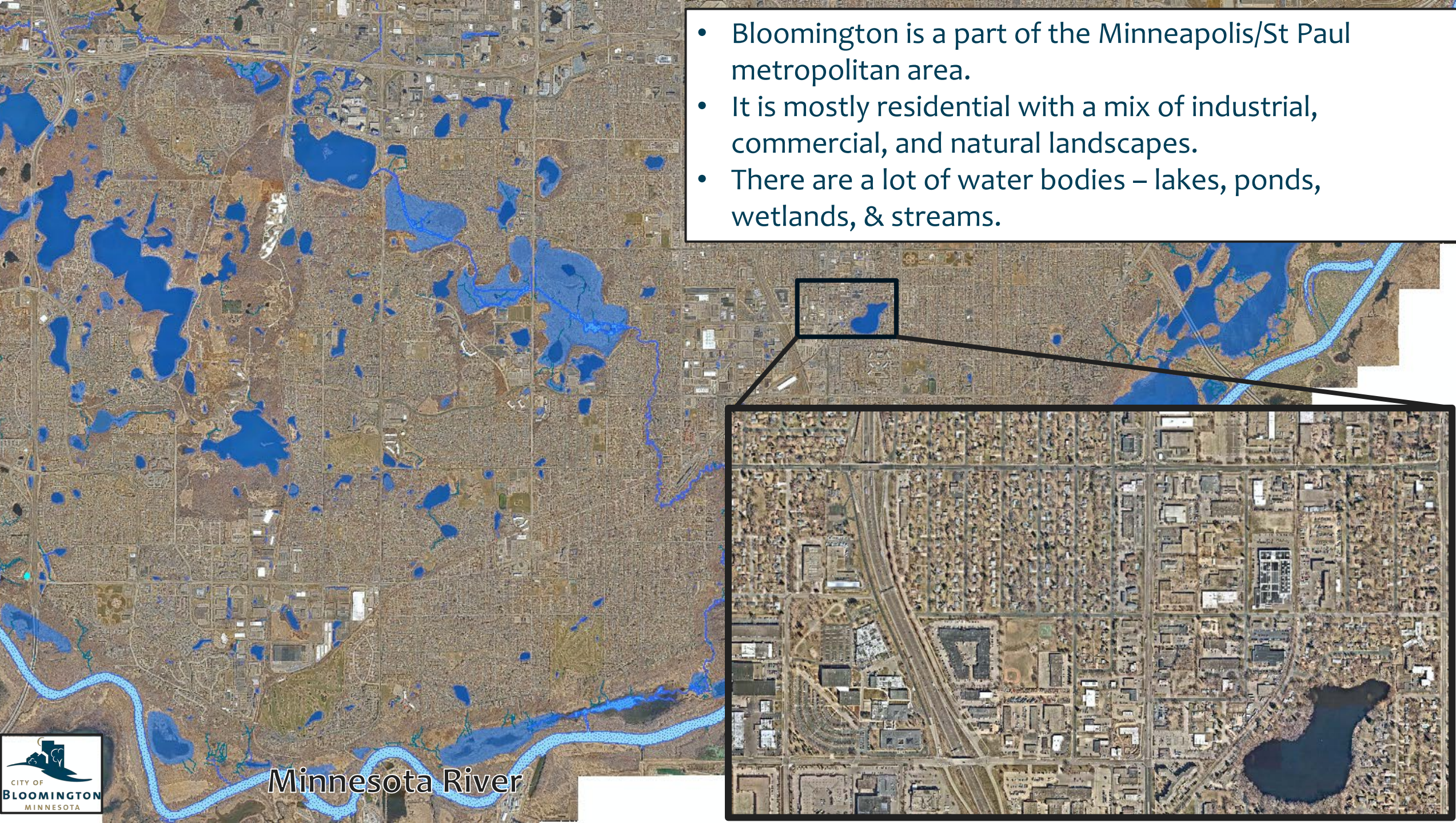
WINTER INTENDANCE & SALT ELIMINATION WISE

BRYAN GRUIDL & JACK DISTEL,
CITY OF BLOOMINGTON



City of Bloomington, MN
44.8 degrees latitude

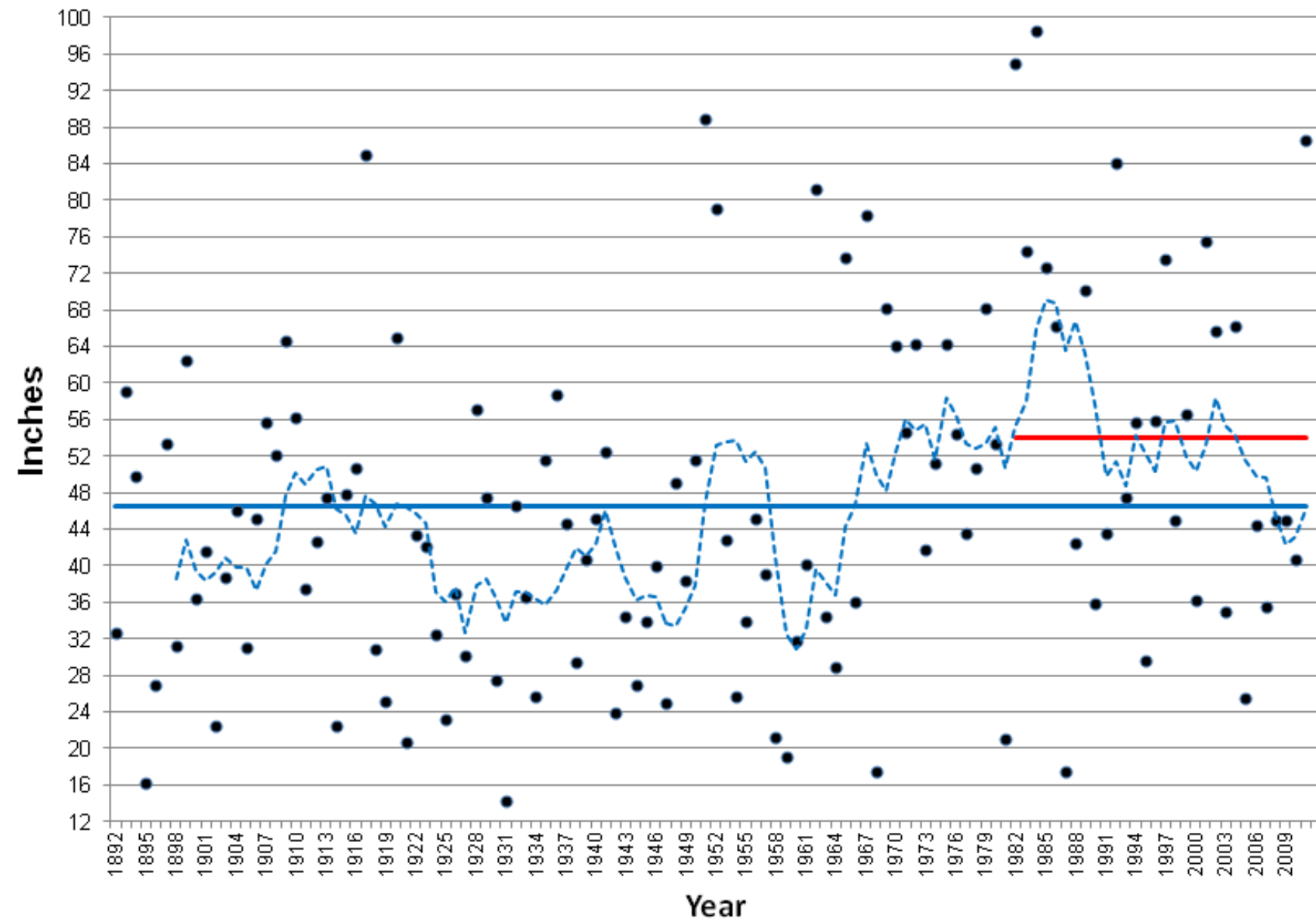
- Bloomington is a part of the Minneapolis/St Paul metropolitan area.
- It is mostly residential with a mix of industrial, commercial, and natural landscapes.
- There are a lot of water bodies – lakes, ponds, wetlands, & streams.



Minnesota River



Minneapolis/St. Paul Seasonal Snowfall Totals



Area Averages:

- **32.5** inches of precipitation per year
- **54.4** inches total snow depth per year
- **14.4** days of plowable snowfall per year (1 inch depth or greater)

*Data from Minnesota Department of Natural Resources

Municipal Separate Storm Sewer System (MS4)

Landscape wide management of:

- Storm discharge rate control
- Water quality
- Ecological integrity

Management buckets:

- City operations
- Public land & infrastructure
- Private property standards

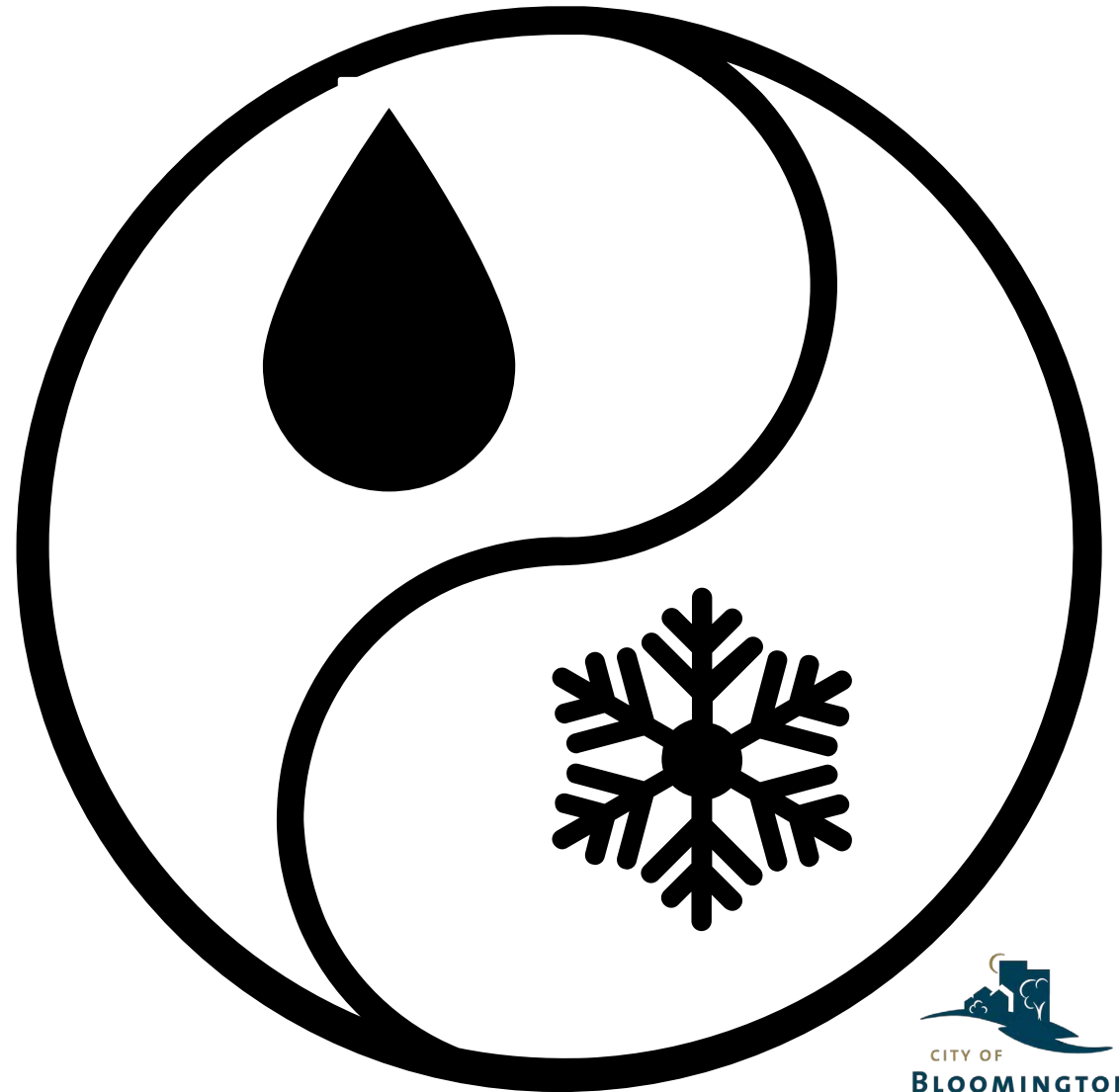


Stormwater includes snow and ice



Expanding water management through:

Winter
Intendance &
Salt
Elimination



Salt is often a necessary management practice but it is not a good one.



It's a wise to:

Create a winter landscape that is accessible, safe, and does not harm water quality or ecological integrity.

- 1. Infrastructure design**
- 2. Processes & Technology**
- 3. Awareness and behavior**





**THE CITY OF BLOOMINGTON STRIVES TO BE THE BEST
SNOW AND ICE REMOVAL PROGRAM IN THE BUSINESS**



IT TAKES A VILLAGE

- Street maintenance
- Park maintenance
- Utilities
- Fleet
- Golf Maintenance
- Facilities
- Traffic
- Support Staff



- 2,016 Lane Miles
- 520 Cul-De-Sacs
- 260 Miles of Sidewalks
- Nine Mile Creek Chloride TMDL

PAST PRACTICES:

- Waited until snow is on the pavement or streets became slippery.
- Start event at 3 am for full plow 5:30 am for sanding call.
- 14 arterial/sanding routes with 14 trucks.
- 28 full plow routes
- Sand only
- Outside equipment/ material storage.



CURRENT PRACTICES:

- Anti-icing in advance of snow and ice events
- Flexible start time.
- 9 arterial/salting routes with 18 trucks.
- 28 full plow routes.
- De-icing strategy is event based. Primary considerations are weather forecast and pavement temperature
- Inside storage for all equipment and materials.



AWARENESS, BEHAVIOR & STAFF TRAINING

- Partnerships
- Social media
- Bloomington Briefing
- Public Works open house
- Community social marketing

Smart Salting Training



August 18th from 8:00 - 1:30:

Training will be virtual and access links will be emailed to participants.
Check in will begin at 7:45

Training topics:

- Application Rates of Materials
- Calibrate Equipment
- Conditions
- De-icing and Anti-Icing
- Environmental Effects
- Local Issues and Additional

Winter Maintenance

**Bloomington
Public Schools
Improve Safety
and their Bottom
Line with Anti-
icing Strategies**



OPERATIONAL BMPs

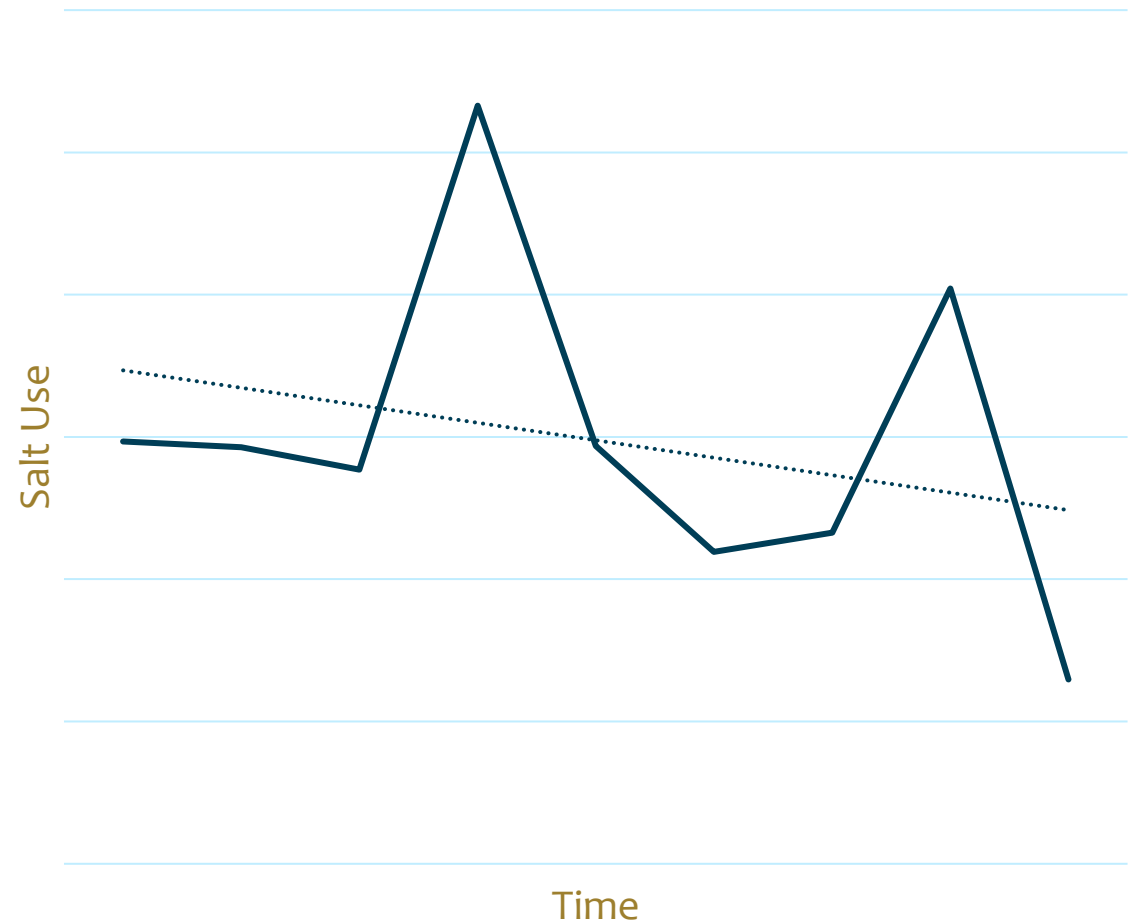
- Salt Storage
- Anti-icing
- Pre-wetting
- Segmented blades
- Pavement Temp Sensors
- Annual Calibration
- Brine Extreme
- Policy and Procedure
- AVL



SUCCESSFUL IMPLEMENTATION

- Decreasing salt trend
- Continue to work with technology to improve operations
- Continue to implement use of liquids

Annual Salt Use Trend



WHAT'S NEXT

- **Winter Intendance & Salt Elimination**
 - Maximize efficacy of winter intendance
 - Low salt design strategies
 - Increasing safety while decreasing salt use
- Expanding target audiences
 - Private applicators
 - Property managers
 - Property owners

Winter Intendance & Salt Elimination



WINTER INTENDANCE & SALT ELIMINATION



- Winter Safety and Accessibility
 - Safety goals may vary by location type of surface, and user input
- Awareness and Behavior
 - Encourage a shift in winter maintenance operations both public and private
- Policy
 - Coordinate efforts across a spectrum of management and policy initiatives
- Technology and processes
 - Enhance winter maintenance efficiency through innovative technologies and improved processes
- Low salt design strategies

LOW SALT DESIGN STRATEGIES

- Prioritize winter-specific considerations throughout design process
- Improving Pavement Recovery
 - Shadowscape from winter sun angles
- Easing Snow Removal
 - Minimizing obstacles like parking lot islands



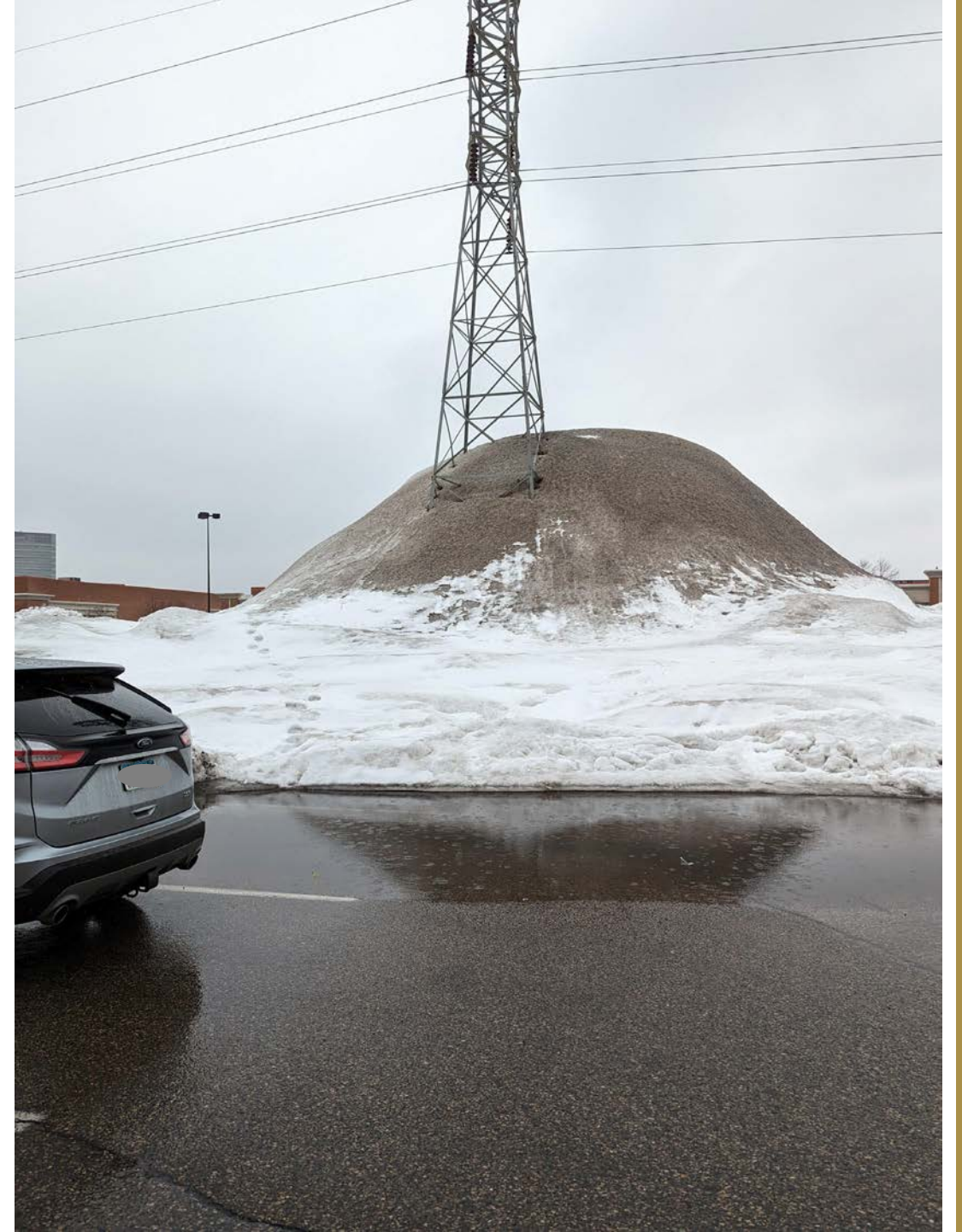
LOW SALT DESIGN STRATEGIES

○ Snow Storage

- Allocating storage space in design
- Managing meltwater

○ Reducing Repeat Offenders

- Blowing snow
 - Identify areas prone to drifting snow
- Meltwater sprawl
 - Vertical and horizontal





CHALLENGES

- Change in habits and behavior of designers
- Public and private properties are not the same
- Competing interests within the organization
- Level of service
- Existing infrastructure
- Cost constraints and maintenance

OPPORTUNITIES

- Continue to refine and improve active snow and ice management
- Changing the built environment through good design