



# SNOW OPERATIONS 101

*January 24, 2024*

# 2022-2023 Snow Season Summary



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# Snow Operations Summary

## SAINT PAUL WINTER OPERATIONS

2022 - 2023

**90.3" of Snow**

3rd snowiest winter on record

**20 Days**

of one-sided parking ban

**11,085+ Hours**

of Snow Emergency plowing

**12,600+ Lane Miles**

plowed during Snow Emergencies

**1,200 Tandem Loads**

removed from city streets

**55,000+ Gallons**

of brine anti-icing initiatives

**44 Weather Events**

highest precipitation amounts to date

**18,484 Tons**

of salt applied

**108 employees**

worked over 16+ hours straight

**7 Snow Emergencies**

one back-to-back event declared



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# Ticketing & Towing Summary

Snow Name	Emergency Dates	Tickets	Tows
ALCOVE	11/29/22 - 12/3/22	2,239	800
BANFIL	12/15/22 - 12/19/22	2,406	830
CAMBRIDGE	12/21/22 - 12/23/22	1,684	403
DUDLEY	1/4/23 - 1/8/23	2,155	430
ENERGY	1/19/23 - 1/23/23	2,389	795
FSK	2/22/23 - 2/27/23	1,624	408
GRACE	2/23/23 - 2/27/23	1,752	687
1-SIDE BAN	3/15/23 - 3/31/23	6,436	638
<b>Totals:</b>		<b>20,685</b>	<b>4,991</b>

CITATION			
State of Minnesota			
Citation #: 629600046229			
County Name: Ramsey		Sequential Citations ____ of ____	
Identification: <input type="checkbox"/> DL <input type="checkbox"/> DVS Web	<input type="checkbox"/> Photo ID <input type="checkbox"/> FP <input type="checkbox"/> Other		
DL Number	MIN	<input type="checkbox"/> CDL <input type="checkbox"/> State	
Name: First Middle Last Suffix			
Address - Street, Apt #			
City		State	Zip
DOB (mm/dd/yyyy)	Height	Weight	Eyes Gender
<input type="checkbox"/> Juvenile Court Offense, Circle One: JTR, JPO, DEL		<input type="checkbox"/> Same address as Juvenile	
Parent or Guardian's Name:			
Address:			
Veh. Lic. No. 301 XVA	Plate Year 2020	State MN	Make HONDA Style 10+ pass. Color BLACK
Date of Offense 02/11/2020	Time of Offense 1757		
<input type="checkbox"/> Endangering Life or Property *Court appearance required if checked		<input type="checkbox"/> Commercial Vehicle <input type="checkbox"/> Hazardous Materials (DOT) DOT#	
<input type="checkbox"/> Driver <input type="checkbox"/> Owner <input type="checkbox"/> Passenger	<input type="checkbox"/> City <input type="checkbox"/> Parked <input type="checkbox"/> Booked		
Offense Location IFO 1086 YORK		Circle One: City/County/Township/Other or: St Paul	
Offense Charge Description SNOW EMERGENCY	Statute/Ordinance 161.03.a	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
Offense Charge Description	Statute/Ordinance	<input type="checkbox"/> 3rd violation	PM, M, GM
<input type="checkbox"/> AC Taken - AC: Test type: <input type="checkbox"/> Breath <input type="checkbox"/> Blood <input type="checkbox"/> Urine <input type="checkbox"/> Other Substance <input type="checkbox"/> Refused			
If this is a payable citation, you must pay the amount owed or schedule an appearance within 30 days from the date the citation was issued. See the back of this citation for more information.			
Officer(s) Name(s) BOSSEN		Officer No(s) 712	Prosecutor St Paul
Controlling Agency (CAG) CC0629600	How Issued <input type="checkbox"/> In Person <input type="checkbox"/> Mailed <input checked="" type="checkbox"/> Left at the Scene	Date Issued 2/11/2020	
Agency Name: St Paul Public Works		CNICR 20023457	
Rev. Version: 2017.1			

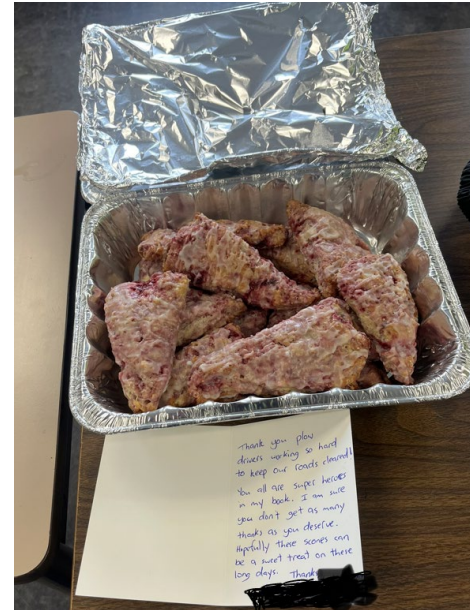
629600046229

SB



# Communications & Engagement Summary

- StPaul.gov/snow (snow webpage) and Interactive Snow Emergency Parking Map are the #1 and #4 most frequented pages on the City's website
  - Nearly **500,000 visits** to [st.paul.gov/snow](https://st.paul.gov/snow)
  - **67,000+ visits** to [st.paul.gov/snowemergency parkingmap](https://st.paul.gov/snowemergency parkingmap)
- 1+ million emails & texts sent to residents (opt in)
- Social Media
  - Public Works Twitter (*numbers do not include City Twitter*)
    - 98** posts
    - 179** replies from staff
    - 1,742** interactions
  - City of Saint Paul Facebook (*PW & Snow Emergency posts were 67% of total posts from 11/28/22-4/1/23*)
    - 132** posts
    - 697** replies from staff
    - 895,765** viewed posts
    - 33,042** interactions (likes, comments, clicks etc.)
- 180+ media inquiries & interviews
  - 2 press conferences with Mayor

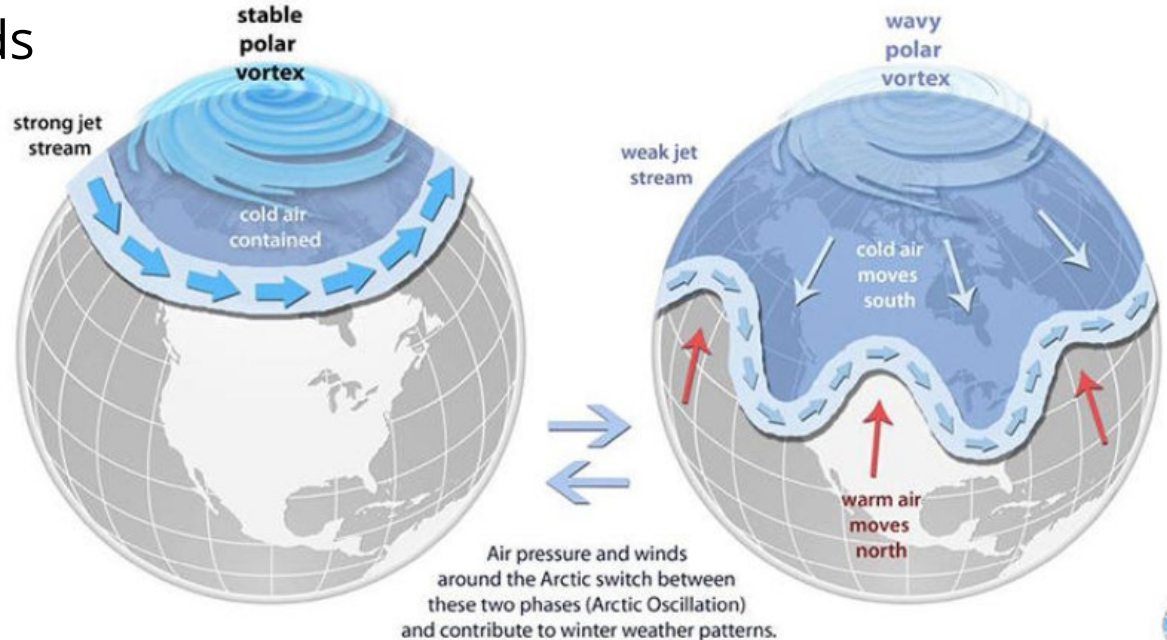




# What's Changed?

- Climate change  
*(graphic from NOAA)*
- On-street parking needs
- Driving behavior, volumes, and patterns
- Modal shifts in transportation
- Resident service expectations
- External work force dynamics

## The Science Behind the Polar Vortex





# What are the City's current plowing standards?



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# Winter Maintenance Service Levels

## Arterial Streets (764 lane miles)

- Plowed and treated to bare pavement in drive lanes
- Plow compacted snow in parking lanes
- *Plowed and treated during all winter events*



## Residential Streets (1,186 lane miles)

- *Safe and passable*
- Plow compacted snow
- Salt high priority areas: hills & curves
- *Only plowed during snow emergencies*





# When do we send plows out and how many?



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# What is a Winter Event?

## Winter Event: Any time Public Works responds to winter weather conditions

- Small: Anti-icing or deicing bridge decks overnight for frost (*2-7 trucks*)
- Medium: Salting and plowing operations on arterials and problem spots (residential hills, curves, etc.) with 2"-3" of snow (*10-30 plows*)
- Large: Snow Emergency declared; plow all arterial and residential streets (*70-80 plows*)
- **Average 20-30 Winter Events per winter season**

2018-2019:

- 27 Winter Events ; 7 Snow Emergencies

2019-2020:

- 19 Winter Events ; 4 Snow Emergencies

2020-2021:

- 17 Winter Events ; 2 Snow Emergencies

2021-2022:

- 20 Winter Events ; 4 Snow Emergencies

2022-2023:

- 44 Winter Events ; 7 Snow Emergencies (including a back-to-back); 1-sided Parking Ban



# What is Public Works responsible for with winter operations?



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# City of Saint Paul: Public Works Snow Operations

1,950 lane miles – Saint Paul to Anaheim, CA

- County: 246 lane miles (*by reimbursable maintenance agreement*)
- State: 122 lane miles (*by reimbursable maintenance agreement*)
- City (Arterial): 396 lane miles
- City (Residential): 1,186 lane miles

186 Bridge Sidewalks, City Sidewalks, Medians, and Public Stairs

97 Bridges

2,225 alleys (*not plowed by City*) which is 330 miles

145+ miles of bike lanes and more miles of bike paths and trails

# How much does a Snow Emergency cost?



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# Budget: More than just plowing

PW Winter Operations Budget – plowing, brining, shoveling, pothole patching, garbage/illegal dumping

Winter season spans across 2 budget years

\$400,000 - \$800,000 per snow emergency

Budget 4 snow emergencies per calendar year

- 3 snow emergency January – April 2022
- 3 snow emergency November & December 2022
- 4 snow emergencies in January – April 2023 (and 1-side parking ban)

Staffing is 365/24/7, but changed for winter – increase nights and weekends



# What does winter operations staffing look like?

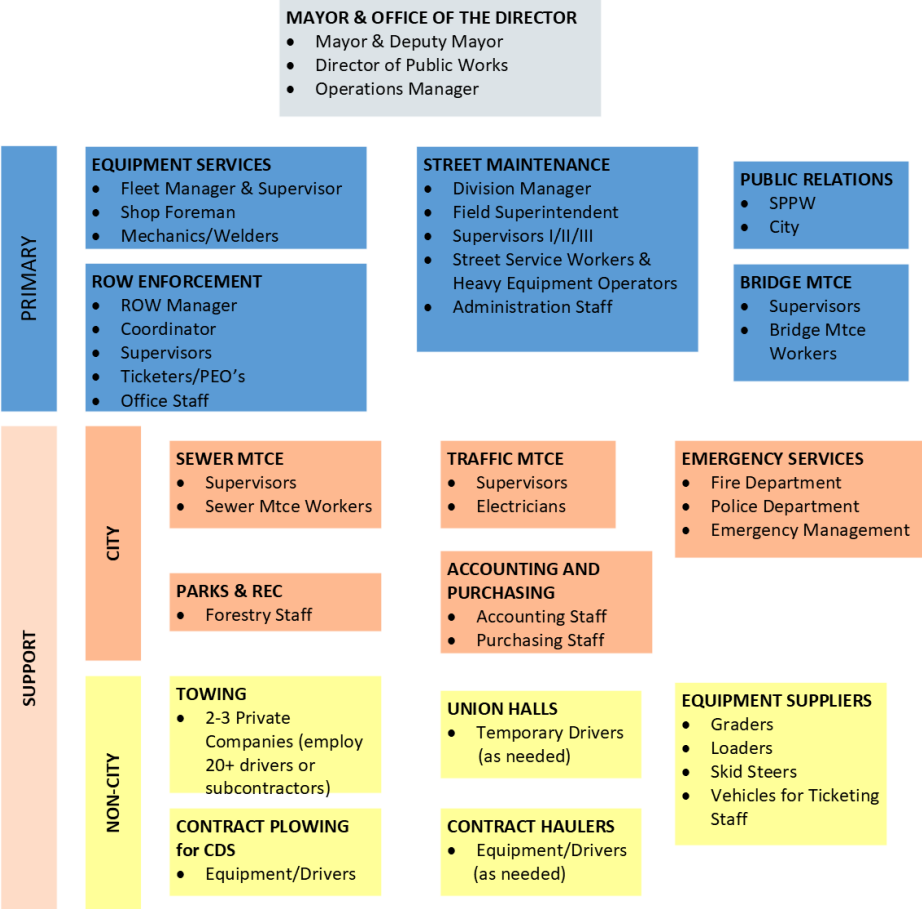


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# Winter Events Organizational Chart



# When do we declare a Snow Emergency?



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# Snow Emergency Declaration

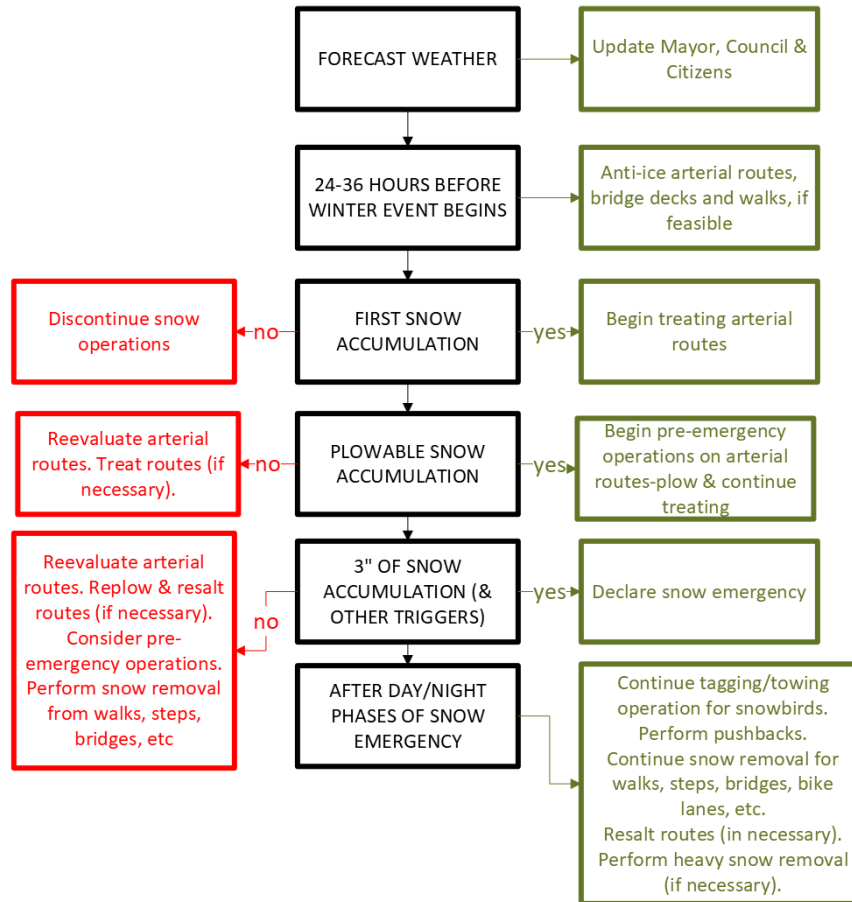
- Snow Emergency Declaration decision based on:
  - Snow accumulation (3" or more)
  - Snow/water ratio
  - Existing road conditions
  - Future weather
  - End of snow event
  - Confer with other cities/SPPS/emergency services departments
- Snow Emergency Declared by 3 p.m., start at 9 p.m.
  - Night phase and day phase (first 20-24 hours)
  - Clean up phase (next 72 hours)
  - Snow Emergencies last 96 hours
- Decision makers:
  - Mayor/Deputy Mayor
  - Public Works Director
    - Public Works Operations Manager
      - Street Maintenance Division Manager
- Communications: notify public (e.g. web, social, email/text); parking rules/compliance

**When does a Snow Event  
become a declared Snow  
Emergency? Why do we not do  
"back to back" Snow  
Emergencies?**





# Progression of Operations



# What are the Snow Emergency Phases?



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# Snow Emergency Phases

## Declared but not in effect (approx. 3 p.m. – 9 p.m.)

Communications: Snow Emergency declared and winter parking rules in effect at 9 p.m.

PW Operations: Preparing plows, staff and ticketing operations



## Night Plow Routes (9 p.m. – 7 a.m.)

Communications: Night Plow has started

PW Operations: Ticketing & towing on Night Plow routes, Plowing Night Plow routes throughout City



## Day Plow Routes (8 a.m. – 5 p.m.)

Communications: Day Plow has started

PW Operations: Ticketing & towing on Day Plow routes, Plowing Day Plow routes throughout City, Plowing bridge sidewalks and bike lanes



## Clean Up (5 p.m. – remainder of 96 hours)

Communications: Night & Day plow routes complete, park only where fully plowed to the curb, vehicles can still be ticketed & towed

PW Operations: Ticketing & towing of snowbird vehicles, Clean up of Intersections & Pushbacks where vehicles have moved; clearing medians, bike lanes, steps, crosswalks, and city sidewalks



**Do you use salt? Do you salt  
residential streets?**



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# Anti-Icing & Brine

- Minimizes bonding of ice/snow to road surfaces
- Priority Routes
  - Bridge decks & downtown
  - Arterials by traffic volume
  - Residential hills/curves
- Average 50,000 gallons/event
- Fringe events are difficult – rain/sleet/snow
- Salt products less effective at  $<15^{\circ}\text{F}$ 
  - Prewet for activation and sticking in the drive lanes
- Technology is evolving
  - High capacity brine making equipment
  - New brine materials
  - Direct liquid applications used more than in past years



**Why do plows not go to  
pavement/curbs in residential  
streets?**

**Why did a plow drive by with  
it's blade up?**





# Art of City Plowing

72 plow routes for Snow Emergencies (35 Night and 37 Day Routes)

Start throughout the City; staffing can affect start times of some routes

Routes are maximized for efficiency

- Timed to be completed within the phase when fully staffed

Speed of plows to lift snow

- Intersections, driveways, sidewalks, and differing boulevard & street widths

Arterial vs. residential plowing

- Residential streets are not plowed to bare pavement
- Center cuts; pushes snow into parking lanes

Avoid urban obstacles

- Parked cars, trailers; recycling and garbage carts (do not put in street); bump outs; center medians
- Snow pushed into street causes hazards



# What are some of the challenges to plowing in Saint Paul?



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# Urban City Plowing Operational Challenges

- Lack of off-street parking
  - Colleges, apartments
  - Abandoned cars
- Narrow streets
- Sidewalks and sidewalk corners
- Multiple street and alley intersections
- Limited and variable snow storage space in boulevards
- No routing software; paper route lists
- Residents, businesses, private contractors plowing snow into the street
- Steep hills and curves
- Bike lane maintenance
- Equipment – limited, older
- Staffing – lack of plow operators (CDL) & ticketers
- Bus stop shoveling (Metro Transit, Public Works, Private Property Owners)
- Limited rental equipment availability



# Why can't we plow like Roseville or Maplewood?



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# Comparisons

## Minneapolis

- Belly plows on trucks and can go into residential streets more frequently
- More unannounced residential plowing
- More center passes
- Plow alleys (via contractor)
- Complete pass in 36 hours during snow emergencies (20 hours for Saint Paul)
- Use more sand (Saint Paul uses Best Practices of salting at 15F or higher)
- Plows 18 miles of state and county roads (Saint Paul plows 107 miles of state and county roads, which are high priority)
- Staffing – can call in municipal garbage and water employees for larger plowing efforts

## Suburbs

- Seasonal parking bans
- Wider streets
- Predominantly off-street parking
- Don't have sidewalks on both sides of road
- More public boulevard/right of way (e.g. cities don't have trees or items in boulevard areas)
- More snow storage space
  - Benching
  - Piling snow in cul-de-sacs
- State and county roads not plowed by city

**Why don't you ticket and tow  
more cars?**



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# Ticketing & Towing Operations



- **We have parking problems, not plowing problems**
  - Lack of off-street availability
  - Low compliance of cars being moved
- **Tickers: Full-time & temporary City employees, SPPD, parking enforcement**
  - Need 70 ticketers for Night Routes
  - Need 70 ticketers for Day Routes
  - Follow the exact plow routes; eventually get passed by plows, but continue to ticket
- Tickets: 2,200+ per snow emergency (2022-2023)
- Tow: 700+ per snow emergency (2022-2023)
- Cost:
  - Parking ticket: \$56 (Ramsey County)  
*Public Works doesn't get any proceeds, but pays the expenses*
  - Impound fee: \$226.46 plus \$15 storage a day (Tow company & SPPD)



**How do we let people know  
when we declare a Snow  
Emergency?**

**Where can I find information or  
sign up for email and text  
alerts?**



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# Communication Tools

- Snow Emergency brochure - mailed to 81,000+ residents (July)
  - Translated versions online: Spanish, Hmong, Somali, Oromo, Karen, Burmese, Lao
- [stpaul.gov/snow](http://stpaul.gov/snow)
- 651-266-PLOW (recorded Snow Emergency message)
- [Snow Emergency Parking Map](#)
- GovDelivery emails & text alerts – opted in 140,000 emails & texts
  - English, Spanish, Hmong, Somali, Oromo (text only)
- Everbridge Resident Connect – recorded voice message (new 2024)
  - English only, reaches 168,800 registered residents, businesses, and organizations
- Social media
  - [Nextdoor](#) (1 multi-lingual message) 85,000 members
  - [Facebook](#) (1 multi-lingual message) 34,000 followers
  - [X/Twitter](#) (4 tweets in different languages on PW and City) 9,500 & 74,300 followers
  - Instagram (new 2024)
- Paid digital advertising – Pioneer Press & All Over Media (*weekdays only*)
- Media outlets
- City cable channel 18
- TPTs Emergency Response System (multilingual)
- Library and Parks & Rec digital display boards
- All-City employee email
- On street dynamic display boards & LRT stations (new in 2023)





# How can you help?

- Share Snow Emergency Info and Resources Often (all year long!)
  - Encourage people to sign up for Snow Emergency alerts and texts – [stpaul.gov/snow](http://stpaul.gov/snow)
  - Encourage people to download the Snow Emergency Parking Map – [stpaul.gov/snowemergencyparkingmap](http://stpaul.gov/snowemergencyparkingmap)
  - Share updates and info about the Snow Emergencies through your channels
  - Answer resident questions & inquiries
  - Do not put recycling and garbage carts in the street
- Night & Day Plow Phases
  - Direct residents to 651-266-PLOW (recorded message) or [stpaul.gov/snow](http://stpaul.gov/snow)
  - Use Snow Emergency Parking Map to help residents know when & where to park
- Clean Up Phase
  - General clean up (icy areas, windrows, pushbacks) – [snowemergency@stpaul.gov](mailto:snowemergency@stpaul.gov) (provide detailed location info)
  - Blocked storm drain – Sewers 651-266-9850
  - Sidewalks not shoveled – DSI 651-266-8989
  - Damage caused by plow – Street Maintenance 651-266-9700 or [snowemergency@stpaul.gov](mailto:snowemergency@stpaul.gov)



# How can you help? (Ticketing & Towing)

- During Clean Up Phase – Parked/towed car related questions
  - To request ticketing & towing of parked cars
    - Call 651-266-9800 (option 2) with detailed location information & car description
    - Online form activated after night and day plow phases are done ([stpaul.gov/snowticketing](http://stpaul.gov/snowticketing))
    - After Snow Emergency ends (96 hours) – call Police non-emergency at 651-291-1111 with detailed location information & car description
  - To find towed cars
    - Visit [stpaul.gov/impound](http://stpaul.gov/impound) & enter VIN or license plate number
    - Call Cathlin Street (across from State Fair) at 651-502-7480



# How can you help? (Recycling & Garbage)

- Do not put recycling and garbage carts in the street!
- Find out about winter weather collection delays [stpaul.gov/wintercollection](http://stpaul.gov/wintercollection)
- Recycling
  - Call the City at 651-266-6101
  - Visit [stpaul.gov/recycle](http://stpaul.gov/recycle)
- Garbage
  - Find garbage hauler – [stpaul.gov/collectionmap](http://stpaul.gov/collectionmap)
  - Aspen Waste Systems: 612-884-8008
  - Gene's Disposal Service: 651-426-1224
  - Highland Sanitation: 651-458-0043
  - Republic Services: 651-286-4590
  - Waste Management: 763-784-8349



# Other Winter Weather Impacts



Sidewalks – shoveled by property owners, within 24 hours of snowfall



Bus stops/shelters & light rail - MetroTransit



Park trails – Parks plows



Alleys – not plowed by City



Recycling & Garbage – do not put carts in street or snowbanks, shovel out a space for your cart



Bike lanes and dedicated bike paths (e.g. Summit Ave and Pelham St)





# Snow Emergency Info & Contacts



[www.stpaul.gov/snow](http://www.stpaul.gov/snow)



651-266-PLOW (7569) Snow Emergency Status (recorded message)



[snowemergency@ci.stpaul.mn.us](mailto:snowemergency@ci.stpaul.mn.us) To report specific locations of icy areas, windrows, pushbacks during the Clean Up Phase



651-266-9800, option 2 Ticket & Towing Office; leave voice mail message



651-266-9700 Street Maintenance; leave voice mail message

A photograph of a snowplow clearing a road is positioned on the left side of the slide. The snowplow is blue and white, with its front blade lowered and pushing a large pile of snow. The background shows a snowy landscape with trees and a building. The image is partially obscured by a large white curved shape that frames the text.

**Questions?**