

City of Madison
Department of Public Works
Chris Kelley, Street Superintendent
Procedures for Snow & Ice Control

The following is the City of Madison Street Division's program and procedures for scheduling staffing and equipment in a snow and ice emergency.

The City of Madison limits the amount of salt that is applied to its streets as an effort to protect its groundwater and the quality of the lakes. Only main arterials, thoroughfares, main connector streets, Madison Metro bus routes, streets surrounding hospitals and schools and major hills and curves are salted. All other City of Madison streets receive sand to act as an abrasive on hills, intersections and curves.

Weather reports from our local weather bureaus are monitored daily. A private meteorological service also supplies two operational forecasts per day plus a twenty-four hour storm alert-warning service. Multiple internet weather forecasting sites and radars are also monitored. Pavement temperature sensing stations are monitored to also assist in starting and ending times of a snow event as well as determining when salt should or should not be applied.

When a storm warning is received, it is necessary to consider these factors before scheduling personnel and equipment:

1. Time of day storm starts
2. Day of the week
3. Duration of storm
4. Temperatures-during and after storm
5. Wind velocity – during and after storm
6. Water content of snow
7. Type of precipitation; snow, sleet or freezing rain
8. Time of year
9. Intensity of storm

- I. The first units scheduled out are the salt spreaders
 - A. The salt routes cover all bus routes, primary streets and streets to and from hospitals and schools.
 - B. Each piece of equipment is a one-person operation and is radio-equipped.
 - C. Each operator has a scheduled list of streets to apply salt to, defined as to priority sequence, and the amount of salt to be applied. Salt is applied at a rate of 300 lbs. per two lane

miles of street. Liquid sodium chloride (salt brine) is also applied with the salt at a rate of 10-12 gallons per ton of salt.

- D. Liquid organic deicer is used when temperatures fall below 15 degrees and salt alone becomes ineffective.
- E. Anti-icing techniques are applied to main arterials prior to a snow event when conditions are correct at an application rate of 40 gallons per lane mile.
- F. Each salt spreading unit is equipped with a plow. The plow is usually in operation at the same time the spreading operation is taking place. This is done in order to use less salt and to accelerate pavement becoming bare.
- G. If the storm warning is received during regular working hours, the units are loaded with salt and placed on "standby".
- H. When the snow accumulation warrants it, the units are dispatched to routes.
- I. Monday through Friday, between the hours of 5 A.M. and 6 P.M., which are the high volume traffic hours, 30 scheduled salt routes are completed in approximately two hours.
- J. Monday through Friday, between the hours of 6 P.M. and 5 A.M. and on weekends, there are 26 scheduled salt routes.
- K. After the salt spreading operation is complete, the spreading units are converted to spread sand abrasives and are dispatched to residential areas. Sand abrasive is applied to hills, intersections and curves.

- II. When the snow accumulation reaches 3" or more, we evaluate and, if necessary, declare a "Snow Emergency" and convert from a spreading operation to an all out plowing operation. (During a Snow Emergency" declaration, alternate side-parking restrictions go into effect in the Snow Emergency Zone and remain in effect throughout the remainder of the City. The Snow Emergency lasts for a minimum of 2 consecutive nights.)

Scheduling and timing a full-scale plowing operation has to be a well-thought out process because of its cost. Commencing a plowing operation too early or too late can add considerable amounts of additional expense to the operation and could generate citizen complaints.

After most snow events where all Madison streets are plowed, snow plowing can be accomplished in approximately a ten hour to twelve hour period.

The ideal time for starting the plowing operation is midnight, due to the reduction in traffic volumes, so that plows may move faster and safer.

Throughout the storm, the Streets Division concentrates personnel and equipment to plowing bus routes and main arteries throughout the night. Full-scale plowing operation will begin when the accumulation of snow is over or just about over. This helps reduce overtime costs for personnel, and insures that the major streets are available for commuting traffic.

City owned sidewalks and the School/Handicap Crosswalk lists are maintained during regular business hours during a storm. Parks and City Engineering are also involved in maintaining City Bike Paths during and after a snow event. The main bike routes are maintained starting at 4:00 a.m. on weekdays in order to be traversable by the morning commute.

A full-scale plowing operation results in the use of approximately 170 pieces of equipment, of which approximately 80 are hired from private contractors, and the remaining 90 pieces of equipment are City-owned and operated pieces.

Each operator has a map of the respective area and streets to plow, and a listing as to priority; the road hazards of the area and any special informational notes.

- III. Priorities after the plowing operations is completed:
 - A. Evaluation of conditions of the salt routes. If salt is needed to get to bare pavement on salt routes, salt will be reapplied
 - B. Sanding operations begin. All curves, hills and intersections are sanded.
 - C. Plowbacks and move outs are taken care of. Alternate side plowbacks are taken care of for two consecutive nights if a Snow Emergency has been declared.
 - D. Crosswalk snow removal is begun with the Isthmus Pedestrian Corridor being taken care of first along with the School/Handicap crosswalk list. 8 crews, citywide, are assigned for 3 consecutive nights to begin crosswalk snow removal. Crosswalk snow removal continues throughout the normal workday as well. Crosswalk snow removal continues until the entire City has been checked. (This process takes 3-4 weeks to complete.)
 - E. Snow removal from bus stops, City owned buildings and sight hazards are evaluated and implemented if necessary. Snow removal from Madison Metro Bus stops takes 3-4 weeks to complete.