



BOZEMAN, MONTANA: THE MOST LIVABLE PLACE

STREET MAINTENANCE DIVISION
SNOW AND ICE CONTROL PLAN



FORWARD

The purpose of this plan is to provide City officials and the general public with insight into our operation during the winter months. Communicating our way of doing business will help everyone in their winter travels within the City of Bozeman.

While making Bozeman the most livable place the Street Division will strive to make it the most drivable, bikeable, and walkable as possible, utilizing the available resources and manpower.

This plan addresses four areas of concern:

- Level of Service
- Setting Priorities
- Operational Procedures
- Manpower and Equipment

LEVEL OF SERVICE

The range of service possibilities vary from curb to curb bare pavement all snow hauled away on every street, alley, and sidewalk to not plowing and let Mother Nature melt it.

This first is not physically possible and the second is not acceptable. A snow and ice control plan includes varying level of services depending on a variety of factors such as severity of the event, traffic volumes, emergency services access, available equipment, and available manpower.

The primary objective of the Street Maintenance Division is to provide for the safe and orderly movement of vehicular and pedestrian traffic throughout the City during all weather conditions including severe events. Although some City streets may become temporarily closed during extreme events, we will use all available resources including workers and equipment from other divisions to keep the lanes of travel open at all times.

During the winter months the Street Division will have a crew of 5 out every weekday at 3:00AM. Their goal is to have all the emergency snow routes plowed and sanded before 6:00AM. They will also have the Priority ones, twos, and threes done by 8:00AM.

At 8:00AM, the other 5 operators start and they will concentrate on the residential areas with motor graders utilizing snowgates.

PRIORITIES

The City of Bozeman receives an annual average snowfall of 82 inches. Snowfall is often accompanied with winds in excess of 30 mph and sub-zero temperatures. This plan recognizes that it is not possible to remove all of the snow simultaneously from all of the streets. Factors affecting snow and ice control operations include snowfall rate and accumulation, moisture content, temperature, time of day or week, wind velocity, and duration of the storm. Priorities must be established so that major arterials and other collector streets are cleared first in order that traffic may continue to move safely and efficiently on the City's streets. This plan establishes and defines the following priorities:

(See attached City of Bozeman Snow & Ice Control and Removal map.)

PRIORITY ONE: Emergency Snow Routes (Red)

Streets designated as emergency snow routes and signed as such, with specific road signs placed within the street right-of-way. The purpose of this signage is to alert the public



that these streets are to be kept clear of parked vehicles including trailers which may

obstruct or interfere with snow and ice control operations. Upon declaration of a snow emergency, declared by the City Manager or his/her designated representative, vehicles left unattended on

the emergency snow route (Priority One Route) shall be removed at the owner's expense (Commission Resolution No. 2446). Emergency snow routes are given Priority One designation as they provide a network system for emergency services operations.

PRIORITY TWO: Major Arterials (Blue)

Streets interconnecting high volume streets and completing the major street network with particular attention to schools, hospitals, and business areas.

PRIORITY THREE: Selected Collector Streets and Commercial Areas (Green)

Streets including transit routes and other collector streets necessary to provide access to the major arterials. Streets with businesses and commercial development.

PRIORITY FOUR: Most Residential Streets and Subdivisions

After the end of the storm with accumulations of more than 4 inches and the Priority Ones, Twos, and Threes have been plowed and sanded, we will start on the residential areas using graders with snow gates. By using the snow gates we can minimize the amount of snow plowed into the driveways and intersections.

Plowing in the residential areas creates our greatest challenge, where to put the snow. If we use truck plows we can go much faster but we will plow in every driveway and intersection. We use graders with snow gates so we are able to carry the snow past the driveway and then open the gate and release the snow. These aren't perfect as when there is a lot of snow even the snow gates can't carry all of the snow and some will end up in the driveway.

SNOW REMOVAL: Downtown Business District

When the windrow snow accumulations block pedestrian access and driving lane widths, snow removal may be necessary, especially when the windrows exceed 24" in height.

This process is done at midnight when traffic is at a minimum. Using a snow blower, loaders, and trucks, this process usually takes two nights to complete. Often this is done in conjunction with the State when they are clearing the snow piled on Main Street so we can share equipment that one of us may not have. As time allows and accumulations necessitate, we will also haul snow from in front of schools and other areas where there is little or no boulevard space for snow storage.

OPERATIONAL PROCEDURES

For the purpose of snow and ice control, the City is divided into four quadrants. This is used in the sanding of stop signs and scheduling the residential plowing. These are:

Northeast, Southeast, Northwest, and Southwest.

Stop signs may be sanded before and after plowing depending on the need. Residential plowing on the other hand is dependant on the day of the week. Garbage totes and snowplows don't mix so we try to plow on the opposite side of town that is having their garbage picked up. Generally it goes like this. If plowing starts on:

Monday We start on the NE and SE

Tuesday We start on the NE and SE

Wednesday We start on either side depending on what was plowed last

Thursday We start on the NW and SW

Friday We start on the NW and SW

There will be exceptions to this schedule if we find that a certain area of town isn't getting plowed enough.

We do our best to minimize the amount of snow that may be plowed into your driveway or mailbox. We are not responsible for clearing snow from driveways, mailboxes, or sidewalks. Residents can help by not parking cars on the streets during the day as this is when we will be plowing your streets.

When snowfall or freezing temperatures causing hazardous driving conditions is possible or occurring, the Street Superintendent will determine what actions to take under the following conditions:

1. Slick or Icy Roads- When there is no snow accumulation or snow packed conditions, we will sand all stop signs and traffic signals. Hills and shaded corners will be sanded also. Depending on temperatures, alternative deicers may be used.
2. Snowfall- When snow depths reach 2", we will start plowing and continue plowing until the streets are cleared and then we will go back and sand as outlined in the above condition. In some instances we can plow as we sand but often it is more productive to clear the whole intersection before sanding. Plowing when there is less than 2" causes unnecessary wear on equipment.
3. Heavy snowfall- When snow depths exceed 4" in the residential areas we will begin plowing those streets. We ask that all vehicles be removed from the streets during this time. Vehicles left on the street may very well be plowed in. We are not responsible for plowed in vehicles. Vehicles left for a length of time will be reported to the police and ticketed or towed.

Special Operations

There are times when we will have to take some of our crew and have them assigned to other tasks, for instance, when temperatures are below zero for more than 3 days we may need to go into Bozeman Creek to clear ice and slush to prevent flooding. On the other end of the scale, when temperatures get above 50 we will need to thaw storm drains so that the water will drain. During these conditions we may not be able to complete some

of our plowing and sanding as soon as we would like. When we haul snow from the downtown area, and we use our trucks and personnel, it takes most of our crew to complete the job. This would mean minimal plowing or sanding during the day as that operation is done from midnight to 8:00AM. Also when we use our trucks we have to take the sanders off. Whenever possible we contract with local dumptruck companies to haul the snow so we can continue our daily operations.

Sanding and Deicers

The sand we use contains 10% salt. This is added to the mixture to keep our sand pile from freezing as it is stored outside. We also use other deicers such as Ice Slice® and magnesium chloride. These work very well in temperatures above 10 degrees. Both materials contain a corrosion inhibitor. Their main drawback is that they offer no abrasiveness for traction. Their function is to melt the ice. Ice Slice® is mainly used downtown to cut down on the amount of sand that we have to sweep up. Mag chloride is used to pre wet our sand as it is dropped from the sander. This helps keep the sand in place. You may see other agencies (County and State) applying mag chloride before a storm so that when it starts to snow it doesn't stick. We don't do this very often because of the expense.

County and State Cooperation

We work with the County and State any time we can. Every fall we get together to work out an agreement to help each other as much as we can in order for the citizens to get the best bang for their buck. There are many County roads and State highways tucked in and around Bozeman. It doesn't make sense for a City snowplow to lift his blade when he hits a stretch of road that is County and then put it back down when he is back on the City

road. Such is the case on S. Church where about half way to Kagy it is in the County and then Kagy is in the City. We feel we have an excellent and productive relationship with both of these agencies.

MANPOWER AND EQUIPMENT

The City of Bozeman Street Dept. is staffed with the best people in the State. We are made up of the superintendent, foreman, and ten operators. With a total of over 115 years of experience, there isn't any situation that we've met that we can't handle.

Our Winter Equipment:

- 4 Motor Graders With Snowgates
- 6 Truck Mounted 2-Way Snow Plows With Sanders
- 1 Truck Mounted Sander
- 1 Loader Mounted 2-Way Plow
- 2 1 Tons with Vee Plow And Sander

Facts and Figures:

- Since 1990, Bozeman has gone from 111 miles of streets and alleys to over 200 miles of streets and alleys.
- The Street Dept. has only added three operators since that time.
- With help of our Sign and Signal Dept., we plow over 53,500 square feet of sidewalks.
- We use an average of 2200 tons of salt/sand mixture every winter
- If we were to haul all the snow off the streets one time, it would take a crew of four two years to do it.
- Our morning crew of five covers almost 450 miles from 3:00AM to 8:00AM.
- A manhole sticking up ¼” can stop a 40,000 lb. plow truck as if it hit a wall.
That’s why operators keep their mouth shut when plowing so they don’t lose their fillings.
- We are often asked “Why don’t you lift your plow when you come to my driveway?” On average it takes about 100 feet for a plow to lift after the operator has hit the switch.

Feel free to call us any time at 582-3200 or if you see something that needs immediate attention after hours you can call police dispatch at 582-2000.