



WINTER WEATHER PLAN

Subject:	Oregon City Winter Weather Plan			Document No:	1
Last Reviewed By:		Original Date:	12/12/13	APWA No:	NA
Approved By:				Date Approved:	

Purpose

Oregon's weather can change quickly and without warning. Ice and snow storms can cause a severe economic impact on the community depending on the intensity and duration of the storm. Whenever there is a chance of stormy conditions the City of Oregon City prepares to enact its "Winter Weather Plan" (WWP). This plan is designed to keep transportation systems as operational and as safe as possible during ice/snow storms in order to minimize the economic impact on the community and to provide the prudent motorist with a reasonably safe traveling surface. This WWP consist of a two-phased approach intended to provide the greatest level of service for the commuting public. The first phase is preventative in nature and consists of actions such as applying anti-icing agents, preventing or minimizing the accumulation of ice, to cautionary road closures for known problem areas. This is followed by reactionary response measures to address known snow and ice accumulation by either applying deicing agent, snow plowing, sand application or road closures.

Scope

This document will outline the guidelines set forth by the Oregon City Public Works Department to address inclement winter weather conditions that could adversely affect the general commuting public and the citizens of Oregon City. This document provides guidance for staff in the prioritization of services, as well as the effective application of preventative and reactionary measures. These actions include but are not limited to:

- Keeping emergency routes operational with a priority given to provide a reasonably safe traveling surface for peak travel hours.
- Keeping priority roads operational by applying deicer as a pre-treatment (anti-icing) to roadway surfaces prior to freezing temperatures to help prevent a bond from forming between the pavement and precipitation.
- Utilizing deicer as a technique to cut through frozen ice and snow throughout the storm event.
- Keep Public Transportation routes operational.

- Provide reactionary sanding for police, fire, and emergency medical services along designated routes.
- Keep schools and the hospital open.
- Provide guidelines for conducting operations.

Definitions

Anti-Icing: The application of liquid chemicals to prevent the formation of frost or the bonding of snow or ice to pavement. Initial application can be made either as a pretreatment in advance of freezing conditions and/or storm events.

Black Ice: Popular term for a very thin coating of clear, bubble-free, homogenous ice which forms on a pavement with a temperature at or slightly above 32 F when the temperature of the air in contact with the ground is below the freezing-point of water and small slightly super cooled water droplets deposit on the surface and coalesce (flow together) before freezing.

Deicer: The City of Oregon City utilizes Magnesium Chloride ($MgCl_2$) as its principle deicing agent. Magnesium chloride is used for low-temperature de-icing of highways, sidewalks, and parking lots. When highways are treacherous due to icy conditions, magnesium chloride helps to prevent the ice bond, allowing snow plows to clear the roads more efficiently.

Deicing: The application of liquid chemicals which penetrate into, then accelerate the melting of already formed frost, ice or snow which is bonded to the road surface.

Emergency Operations Center (EOC): a central command and control facility responsible for carrying out the principles of emergency preparedness and emergency management, or disaster management functions at a strategic level in an emergency situation, and ensuring the continuity of operation of a company, political subdivision or other organization.

Freezing Rain: Super cooled droplets of liquid precipitation falling on a surface whose temperature is below or slightly above freezing, resulting in a hard, slick, generally thick coating of ice commonly called glaze or clear ice. Non-super cooled raindrops falling on a surface whose temperature is well below freezing will also result in glaze.

Frost: Also called hoarfrost. Ice crystals in the form of scales, needles, feathers or fans deposit on surfaces cooled by radiation or by other processes. The deposit may be composed of drops of dew frozen after deposition and of ice formed directly from water vapor at a temperature below 32 F (sublimation)

Light Snow: Snow falling at the rate of less than ½ in. per hour; visibility is not affected adversely.

Liquid Chemical: A chemical solution; the volume of solution applied per lane mile is the chemical application rate used in this appendix.

Magnesium Chloride ($MgCl_2$) (as defined for ice control): Is a salt compound extracted primarily from the Great Salt Lake, with added rust inhibitors, used to prevent or remove the buildup of ice and snow on roads.

Moderate and Heavy Snow: Snow falling at a rate of ½ in. per hour or greater; visibility is significantly reduced.

Pre-wet Sand: Liquid $MgCl_2$ chemical applied to sand before it is placed on pavement.

Sleet: A mixture of rain and snow, which has been partially melted by falling through an atmosphere with a temperature slightly above freezing.

Slush: Accumulation of snow, which lies on an impervious base and is saturated with water in excess of its freely drained capacity. It will not support any weight when stepped or driven on but will “squish” until the base support is reached.

Guidelines

These guidelines apply to the City of Oregon City street system and to streets for which the City of Oregon City has special maintenance agreements with other jurisdictions for ice and snow control. Snow and ice control operations consist of anti-icing/deicing, sanding and snow plowing.

Priority Criteria:

In order to maximize the utilization of finite resources the City has developed a list of priority streets for the application of preventative and reactionary winter weather actions. During the activation of the WWP the City will prioritize services to these designated streets but reserves the right to reprioritize streets based on emergent conditions at the City’s discretion. The City has prepared this priority streets list based on the following criteria:

- Traffic volumes
- Public Transportation utilization
- Critical Infrastructure service locations (emergency services, hospitals, schools & public utilities)
- Geographic constraints (steep hills)
- Historically hazardous traffic locations
- Elevated structures (bridges and overpasses)

Operational Guidelines:

The City does not have a bare pavement policy. Snow and ice control operations are intended to provide the prudent motorist with a reasonably safe traveling surface. During heavy snowfall or severe icing conditions motorists may need to install chains or other traction devices.

Anti-Icing / Deicing

- Snow and ice control operations will be performed along designated routes as snowfall occurs. Priorities may be altered to address specific problem areas. **Streets that are not designated snow**

routes will not be treated with anti-icing / deicing agents, sanded or plowed unless specifically requested by the police or fire services and only as resources allow (See Appendix A and Weather Response Route Maps).

- Ice control operations will consist of the application of anti-icing / deicing chemicals and/or sand along designated routes. The City's preferred ice control method is the application of anti-icing / deicing agents. To this end deicing and anti-icing chemicals with corrosion inhibitors may be used in quantities necessary to keep sand stockpiles and sanding equipment operational.
- During ice control operations anti-icing / deicing chemicals and/or sand will normally be applied within 100 feet of a controlled intersection, on bridges, overpasses and their approaches, and along curves and steep grades. Application of anti-icing / deicing chemicals may occur days prior to freezing conditions on designated routes. The city may alter this pattern to address unique storm conditions as necessary.

Sand Application

- When warranted the City will resort to applying treated sand in place of anti-icing / deicing agents. Typically, sand application will only occur when temperatures fall well below the optimal range for chemical agents to function properly. Sanding priority routes are listed in Appendix B.
- Sand cleanup operations in the form of street sweeping will begin at the conclusion of the storm when streets become free of ice and snow, and the forecast does not call for more snow or ice within the subsequent 24 to 48 hours. These activities may be further delayed other operational needs of the City. Priorities for cleaning sand from roads will be the same as for placement of sand. Special attention will be given to arterials with striped bike lanes to ensure they are clean.

Snow Plowing

- Snow plowing will be conducted along designated priority routes (see Appendix A and Weather Response Route Maps). **Plowing activities will not begin until roads have accumulated three (3) or more inches of snowfall.** Plowing prior to this level threatens to impair the overall road condition and is not cost effective for the City's limited resources. Conversely, after prolonged snowfall, accumulated snow becomes compacted and plowing becomes ineffective, at this point the City will revert to merely anti-icing / deicing chemicals and/or sand application.
- All streets designated as snow routes have been prioritized into categories 1, 2, or 3 (See Appendix A.). The emphasis of work will be on priorities 1 and 2 routes. Priority 3 routes will only be addressed during extended storms, providing that personnel and equipment are available and only after priorities 1 and 2 routes are adequately serviced. The city may alter priorities during the course of a storm to address more severe problems or conditions in a specific area of the City.
- **Streets not on the snow route list will not be maintained under snow and ice control operations** even if requested by property owners/citizens. Attempting to sand and plow non-

prioritized streets (i.e. residential streets) would be an inefficient use of the minimal anti-icing / deicing, sanding and plowing resources available. The City, at its discretion, may alter this procedure to address unique issues as events dictate.

Road Closures

- Based on the severity of the winter weather event, the **Public Works Department may close designated streets** (see Appendixes C & D: Street Closure Plan). Additionally, the Oregon City Police Department may close streets temporarily to address accidents. The Public Works Department may provide barricades to Oregon City Police for this purpose.

Other Agencies

- Note that several principal arterials within the City limits such as Highway 99 and Highway 213 are the responsibility of ODOT to maintain. South End Rd (Hill), Forsythe Rd, and Beaver Creek Rd from Highway 213 south east to city limits are Clackamas County's responsibility to maintain. The City will make every effort to coordinate and cooperate with these entities to assure the safety of the roads.

Notifications

- Partner agencies are responsible for notifying Oregon City Public Works Department of icy conditions as soon as they begin to occur. The Oregon City Police Department, Tri Met, Oregon City School District, and Clackamas Fire Rescue are asked to assist with early notifications of icy conditions. The earlier Oregon City Public Works is notified, the quicker the response and assistance can be delivered.
 - Emergency sanding requests by police, fire, and ambulance services will be handled as a number 1 priority.
 - If the school district are operating, a number 1 priority will be placed on assisting them with routes as requested. It is the responsibility of the school district to notify the City as early as possible of problem areas along their routes.
 - Keeping Tri Met bus routes operational as a means of transporting people in and out of the City is a priority. Tri Met is responsible for notifying the City of any problem areas along their routine routes as well as notifying the City if and when they switch to their snow detour routes. The City may assist Tri Met with the downtown Oregon City transit station if requested by Tri Met, provided personnel and equipment are available.
- All Winter Weather activities will be conducted from the City's Public Works Operations Center located at 122 South Center Street. The Emergency Operations Center (EOC) will be activated during any storm event of significance. City Departments should contact the Oregon City Public Works Department by phoning **503-657-8241** to request service or forward complaints. If there is no answer at the Public Works, the Public Works radio channel (**VHF Zone 1 - OCPW DISPATCH**) may be used.

- To notify Oregon City Public Works of icy conditions during non-work hours call the On Call phone number, **503-209-1270**. If the On Call person cannot be reached, contact CCOM by phoning **503-655-8211**. Hazardous road conditions such as downed trees and flooded intersections should be reported in the same manner.
- All significant sanding, anti-icing/deicing and plowing operations will be directed from the EOC. Agencies needing assistance are encouraged to contact the EOC by calling **503-657-8241**.

Anti-Icing / Deicing Application Guidelines

Public Works Operations Division (PW) has established guidelines for the use of anti-icing and deicing agents as a tool to combat winter storms. The information contained herein is intended as a basic guideline only. This in no way constitutes a systematic process or procedure for the use of anti-icing/deicing materials, chemicals, or equipment. The successful use of anti-icing and deicing agents is a learning process through which knowledge, training and experience are gained. The use of anti-icing and deicing agents can be a very beneficial tool when used in conjunction with other best management practices (BMPs) and methods for snow and ice control.

Guidance for anti-icing/deicing operations is presented in Tables 1- 6 for six distinctive winter weather events. The six winter weather events are:

1. Light Snow Storm
2. Light Snow Storm with Period(s) of Moderate or Heavy Snow
3. Moderate or Heavy Snow Storm
4. Frost or Black Ice
5. Freezing Rain Storm
6. Sleet Storm

The tables suggest the appropriate maintenance action to take during preemptive and subsequent reactionary (follow-up) anti-icing/deicing operation for a given precipitation or icing event. Each action is defined for a range of pavement temperatures and an associated temperature trend. Application rates are suggested rates and should be adjusted if necessary to achieve effectiveness or efficiency, for local conditions. Comments and notes are given in each table where appropriate to further guide maintenance field personnel in their anti-icing/deicing operations. Included in the following charts are recommendations for the use of pre-wet sand.

Additional factors that should be considered prior and during winter weather anti-icing / deicing response activities are listed below. Each of items outline basic decision making criteria, and lists some of the basic operational functions to consider and/or follow when applying chemical anti-icing/deicing agents or abrasives.

Weather factors

- Do not apply chemicals prior to forecasted rain

- Do not apply chemicals if temperatures are above 32 F and steady
- Do not apply chemicals in strong winds
- Do not apply chemicals if rain is predicted before a snow storm
- Use caution when anti-icing/deicing in warm conditions with low humidity as a chemical slipperiness condition may occur especially using heavier application rates
- Do not apply MgCl on a heavy snow or ice packs
- Do not apply MgCl in temperatures below 15 F.
- Apply only abrasives in temperatures below 15 F
- Residual effects can remain for up to several days after application of chemicals if precipitation does not dilute the initial application. Refreezing of the surface can occur when precipitation or moisture in the air dilutes the chemical on the surface

Operational considerations

- Always record time, location and rate of chemicals and abrasive application
- Do not over apply chemicals within an intersection.
- Avoid applying chemicals in heavy traffic. Application of anti-icing/deicing agents should be done if possible during slow commuting hours
- Always check spray operations prior to leaving OCPW yard
- **More is not always BETTER.** High application rates can cause slippery conditions

Safety Personal Protection Equipment

All staff members operating in response to a winter weather event will utilize the following personal protective equipment while conducting work activities. This list can be supplemented as events dictate.

- Type III Vest or Jacket
- Gloves
- Safety Glasses
- Ice Trekkers (for boots)
- Hard Hat
- Studded Tires
- Tire Chains
- Flashlight

Table 1. Weather Event: LIGHT SNOW

**Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride**

Pavement Temperature Range, and Trend	Pavement surface at time of initial operation	Initial Operations			Subsequent Operations			Comments
		Maintenance Action*			Maintenance Action*			N/R=Not Recommended
		MgCl gals/ LnMi	Pre-wet Sand		MgCl gals/ LnMi	Pre-wet Sand		
Above 32 F, steady and rising	Dry, wet, slush, or light cover snow	N/R See comment	N/R See comment		N/R See comment	N/R See comment		Monitor pavement temperature closely Treat icy patches if needed with MgCl @ 15-35 G/LnMi or pre-wet sand
32 F, or below is eminent	Dry	Apply @ 15-35 G/ LnMi	N/R		Reapply @ 15-35 G/ LnMi plow as needed	Apply		Application rates will depend on dilution potential
20 to 32 F, remaining in range	Wet, slush, or light snow cover	Apply @ 20-40 G/ LnMi	Plow as needed and apply		Reapply @ 20-40 G/ LnMi plow as needed	Plow as needed and apply		Application rates will depend on dilution potential
15 to 20 F, remaining in range	Dry, wet, slush, or light cover snow	Apply @ 45-65 G/ LnMi	Plow as needed and apply		Reapply @ 45-65 G/ LnMi plow as needed	Plow as needed and apply		Application rates will depend on dilution potential
Below 15 F, steady or falling	Dry or light snow cover	N/R plow as needed	Apply and plow as needed		N/R plow as needed	Plow as needed and apply		Do not apply MgCl at this temperature range Apply pre-wet sand only

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

**Table 2. Weather Event: LIGHT SNOW STORM
WITH PERIOD(S) OF MODERATE OR HEAVY SNOW**

**Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride**

Pavement Temperature Range, and Trend	Pavement surface at time of initial operation	Initial Operations			Subsequent Operations			Comments
		Maintenance Action*			Maintenance Action*			N/R=Not Recommended
		MgCl gals/ LnMi	Pre-wet Sand		MgCl gals/ LnMi	Pre-wet Sand		
Above 32 F, steady and rising	Dry, wet, slush, or light cover snow	N/R See comment	N/R See comment		N/R See comment	N/R See comment		Monitor pavement temperature closely Treat icy patches if needed with MgCl @ 15-35/lm or pre-wet sand.
32 F, or below is eminent	Dry	Apply @ 15-35 G/ LnMi	N/R		Reapply @ 15-35 G/ LnMi	N/R		Application rates will depend on dilution potential
20 to 32 F, remaining in range	Wet, slush, or light snow cover	Apply @ 20-40 G/ LnMi plow as needed	Plow as needed and apply		Reapply @ 20-40 G/ LnMi plow as needed	Plow as needed and apply		Application rates will depend on dilution potential
15 to 20 F, remaining in range	Dry, wet, slush, or light cover snow	Apply @ 45-70 G/ LnMi	Plow as needed and apply		Reapply @ 45-70 G/ LnMi plow as needed	Plow as needed and apply		Application rates will depend on dilution potential
Below 15 F, steady or falling	Dry or light snow cover	N/R plow as needed	Apply and plow as needed		N/R plow as needed	Plow as needed and apply		Do not apply MgCl at this temperature range Apply pre-wet sand only

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

Table 3. Weather Event: MODERATE OR HEAVY SNOW STORM

**Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride**

Pavement Temperature Range, and Trend	Pavement surface at time of initial operation	Initial Operations		Subsequent Operations		Comments
		Maintenance Action*		Maintenance Action*		N/R=Not Recommended
		MgCl gals/ LnMi	Pre-wet Sand	MgCl gals/ LnMi	Pre-wet Sand	
Above 32 F, steady and rising	Dry, wet, slush, or light cover snow	N/R	N/R	N/R	N/R	Monitor pavement temperature closely Treat icy patches if needed with MgCl @ 15-35/lm
32 F, or below is eminent	Dry	Apply @ 15-35G/ LnMi	N/R	Reapply @ 15-35G/ LnMi	N/R	Application rates will depend on dilution potential Do not apply MgCl on heavy snow accumulation or snow pack
20 to 32 F, remaining in range	Wet, slush, or light snow cover	N/R plow as needed	Plow as needed and apply	N/R plow as needed	Plow as needed and apply	Do not apply MgCl on heavy snow accumulation or snow pack Apply pre-wet sand only
15 to 20 F, remaining in range	Dry, wet, slush, or light cover snow	N/R plow as needed	Plow as needed and apply	N/R plow as needed	Plow as needed and apply	Do not apply MgCl on heavy snow accumulation or snow pack Apply pre-wet sand only
Below 15 F, steady or falling	Dry or light snow cover	N/R plow as needed	Plow as needed and apply	N/R plow as needed	Plow as needed and apply	Do not apply MgCl at this temperature range Apply pre-wet sand only

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

Table 4. Weather Event: FROST OR BLACK ICE

**Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride**

Pavement Temperature Range, and Trend	Traffic Count	Initial Operations		Subsequent Operations		Comments
		Maintenance Action*		Maintenance Action*		N/R=Not Recommended
		MgCl gals/ LnMi	Pre-wet Sand	MgCl gals/ LnMi	Pre-wet sand	
Above 32 F, steady and rising	Any level	N/R	N/R	N/R	N/R	Monitor pavement temperature closely Treat icy patches if needed with MgCl @ 15-35/lm
28 to 32 F, Remaining in range or falling 32 F or below, and equal to or below dew point	< 100 vehicles/hr	Apply @ 15-30 G/ LnMi	Apply	Reapply @ 15-30G/ LnMi	Reapply	Application rates will depend on dilution potential
	> 100 vehicles/hr	Apply @ 20-35G/ LnMi		Reapply @ 20-35G/ LnMi		
25 to 28 F, remaining in range, and equal to or below dew point	Any level	Apply @ 20-35 G/ LnMi	Apply	Reapply @ 20-35 G/ LnMi	Reapply	Application rates will depend on dilution potential
15 to 25 F, remaining in Range, and equal to or below dew point	Any level	Apply @ 25-40 G/ LnMi	Apply	Reapply @ 25-40 G/ LnMi	Reapply	Application rates will depend on dilution potential
Below 15 F, Steady or falling	Any level	N/R	Apply	N/R	Reapply	Do not apply MgCl at this temperature range
Below 15 F, steady or falling	Dry or light snow cover	N/R plow as needed	Apply and plow as needed	N/R plow as needed	Plow as needed and apply	Do not apply MgCl at this temperature range Apply pre-wet sand only

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

Table 5. Weather Event: FREEZING RAINSTORM

Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride

Pavement Temperature Range, and Trend	Initial Operations			Subsequent Operations			Comments
	Maintenance Action*			Maintenance Action*			N/R=Not Recommended
	MgCl gals/ LnMi	Pre-wet Sand		MgCl gals/ LnMi	Pre-wet Sand		
Above 32 F, steady and rising	N/R	See comments		N/R	See comments		Monitor pavement temperature closely Treat icy patches if needed with pre-wet sand as needed for traction enhancement
32 F, or below is eminent	N/R	Apply		N/R	Reapply		Apply pre-wet sand for traction enhancement
20 to 32 F, remaining in range	N/R	Apply		N/R	Reapply		Apply pre-wet sand for traction enhancement
15 to 20 F, remaining in range	N/R	Apply		N/R	Reapply		Apply pre-wet sand for traction enhancement
Below 15 F, steady or falling	N/R	Apply		N/R	Reapply		Apply pre-wet sand for traction enhancement

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

Table 6. Weather Event: SLEET STORM

**Magnesium Chloride 27%
Pre-wet Sand/Magnesium Chloride**

Pavement Temperature Range, and Trend	Initial Operations			Subsequent Operations			Comments
	Maintenance Action*			Maintenance Action*			N/R=Not Recommended
	MgCl gals/ LnMi	Pre-wet Sand		MgCl gals/ LnMi	Pre-wet Sand		
Above 32 F, steady and rising	N/R	See comments		N/R	See comments		Monitor pavement temperature closely for drops towards 32 F Treat icy patches if needed with pre-wet sand as needed for traction enhancement
32 F, or below is eminent	N/R	Apply		N/R	Reapply as needed and plow accumulation		Apply pre-wet sand for traction enhancement
15 to 32 F, remaining in range	N/R	Apply		N/R	Reapply as needed and plow accumulation		Apply pre-wet sand for traction enhancement
Below 15 F, steady or falling	N/R	Apply		N/R	Reapply as needed and plow accumulation		Apply pre-wet sand for traction enhancement

* Recommended maintenance actions are subject to change depending on environmental and operational conditions.

CHEMICAL APPLICATIONS: These application rates are starting points. Local experience should refine these recommendations. Time chemical applications to prevent deteriorating conditions or development of packed and bonded snow. Monitor temperature and humidity to determine application timing.

PLOWING: Before applying any ice control chemical, the road surface should be clear of as much snow and ice as possible.

CHEMICAL RATES: The recommended snow and ice control material application rates depend on atmospheric and pavement conditions at the time of treatment and on how these conditions are expected to change over the time period (window) between the current treatment and the next anticipated treatment.

Deicing Priority Streets

Appendix A

DEICING PREVENTION

PRIORITY ONE HILLS

Center St – S 1st to Ogden Dr
 S 2nd St- Center to Tumwater
 Linn Ave- Jackson St to Park Dr
 5th St- Washington St to Jackson St
 Singer Hill
 7th St- John Adams St to Molalla Ave
 Molalla Ave- 7th to Mt. View St
 Pearl St- Linn Ave to Myrtle St
 Pearl St- Warren St to Eluria St
 Washington St- 9th St Through 14th
 Intersection
 15th St - John Adams St to Harrison St
 Division St- Penn Ln to 18th St
 Holcomb Blvd – Redland Rd to City Limits
 Washington St Round-a-bout
 Anchor Way – 18th St to Redland Rd

PRIORITY TWO HILLS

16th St- Jackson St to Division
 Jackson St - 13th St to 16th St
 12th St- Main St to Jackson St
 Pleasant Ave
 Sommer St
 Dimmick hill
 Charman St- Linn Ave to Brighton Ave.
 9th St- Jackson to Washington St
 4th St- Linn Ave to Terrace Ave
 East St- 4th St to Oak St
 Oak St- East St to Linn Ave
 Hazelwood Dr- East St to Linn Ave

DEICING REACTIONARY

PRIORITY ONE HILLS

S 2nd- South End Rd to Tumwater Dr
 Linn Ave- Jackson St to Park Dr
 5th St- Washington St to Jackson St
 Singer Hill
 7th St- John Adams St to Molalla Ave
 Molalla Ave- 7th to Mt. View St
 Washington St- 9th St through 14th St
 Intersection
 Holcomb Blvd- Redland to City Limits
 Oak Tree Terrace
 Washington St Round-a-bout

PRIORITY TWO HILLS

16th St- Jackson St to Division
 Jackson St- 9th St to 16th St
 12th St- Main St to Jackson St
 Pleasant Ave
 Sommer St
 Dimmick Hill
 Charman St – Linn Ave to Brighton

9th St- Jackson to Washington St
 4th St- Linn Ave to Terrace Ave
 East St- 4th St to Oak St
 Oak St- East St to Linn Ave
 Hazelwood Dr- East St to Linn Ave
 Barclay Hills Dr below Alden St
 Peter Skene Way
 Magnolia St – to Apts on Cascade St
 Cascade St
 Apperson Blvd – Near La Rae Rd
 La Rae Rd – Above Apperson Blvd
 Swan Ave – Holcomb Blvd to top of hill
 Hunter Ave – Holcomb Blvd to top of hill

Other Entities

Forsythe Rd

South End- S 2nd to Barker Ave

Beavercreek Rd- Hwy 213 east to City Limits

Sanding Priority Streets

Appendix B

PRIORITY ONE HILLS

S 2ND ST & High St to 99E
 High St hill near S 1st St
 5TH St – Washington St to Jackson St
 Linn Ave – Jackson St to Holmes Lane
 High St near 7th St
 Singer Hill
 7TH St – John Adams St to Molalla Ave
 Molalla Ave 7th St to Mt View St
 Washington St – 9th St through 14th St
 John Adams St – 12th St to 14th St
 12TH St – Main St to Taylor St
 Taylor St – 9th St to 12th St
 9th St – Washington St to Taylor St
 16th St – Jackson St to Division St
 Holcomb Blvd- Redland Rd to City Limits
 Oak Tree Terrace – 16th St to 18th St

PRIORITY TWO HILLS

Barclay Hills Dr below Alden Street
 Peter Skene Way
 Magnolia St to apts on Cascade St
 Cascade St
 Pleasant Ave
 Dimick Hill
 Sommer St
 4TH St – Linn Ave to end
 Jackson St – Above 4th St
 East St hills
 Charman St – Linn Ave to Brighton Ave
 Meyers Rd – Gaffney Lane to 213
 Meyers Rd – Autumn Lane to Leland Rd

PARK PLACE AREAS

Apperson Blvd – Near La Rae Rd
 La Rae Rd – Above Apperson Blvd
 Swan Ave – Holcomb Blvd to top of hill
 Hunter Ave – Holcomb Blvd to top of hill

PRIORITY THREE HILLS

Glenwood Ct
 6th St – Jackson St to John Adams St
 Monroe St – 4th St to 2nd St
 John Adams St – 2nd St to 3rd St
 11th St – Washington St to JQ Adams St
 Madison St – 9th St to 11th St
 Madison St – Hill above 15th St
 John Adams St – 13th St to 14th St
 10th St – Van Buren St to Taylor St
 Barker Ave – Telford Rd to South End Rd
 Hazelwood Dr hills

Jersey Ave – Charman St to Summit St
 11th St – Washington St to Center St

CANEHAH AREA

5TH Ave – South End Rd to 4th Ave
 Blanchard St – 4th Ave to 5th Ave
 5th Place
 4th Ave by Canemah Park
 3rd Ave – Old Canemah Park to Hedges St
 Hedges St – 3rd Ave to 99E

Other Entities

Forsythe Rd

South End Rd – S 2nd to Barker Ave

Beavercreek Rd – Hwy 213 to City Limits

SNOW AND ICE STREET CLOSURES

Appendix C

STREET CLOSURES

S Center St hill – S 1st St to Ogden Dr
S 2nd St – S Center St to High St
Pearl St – Linn Ave to Myrtle St
Pearl St – Eluria St to Warren St
15TH St – John Adams St to Madison St
15TH St – Van Buren St to Harrison St
Anchor Way – 18th St to Redland Rd
Ganong St – 4th Ave to 3rd Ave
12th- Washignton to Main

Other Entities

Forsythe Rd

South End- S 2nd to Barker Ave

Beavercreek Rd- Hwy 213 east to City Limits

WINTER ACTION TIMELINE

Appendix D

At the Onset of Winter

Top of deicer

Conduct walk around training for all staff and go over winter storm protocol

24 Hours Prior

Glowing plow ends (guide sticks)

Cross training – walk around and check vehicles

Review safety protocol for vehicles

Conduct walk around training for all staff members on plows at least 24 hours prior to storm

48 Hours Prior

Make sure at least one vehicle for each department with chains in shop until needed

List of 24-hour shift and response team list

T-Cards for each vehicle

Chains in or on vehicle ahead of time, ice scraper, cots

Check rock salt supply

Check quality of flashlights and supply of batteries

During Winter Storm

Time accounting – sign in/out

Highlight areas plowed – 1 set per shift

Keep the On-Call phone and On-Call laptop with shift supervisor