



PUBLIC WORKS DEPARTMENT

SNOW AND ICE CONTROL MANUAL





www.cityofmoorhead.com

Public Works

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November, 2019

The Public Works Department continually seeks to improve snow and ice control services for our community. The overall strategy is dynamic as our community continues to grow; however, we developed this Snow and Ice Control Manual to document snow removal processes and to help us continually refine our snow and ice removal program.

The public depends on the use of streets and highways during all types of weather related events. When the transportation system is shut down or the capacity is reduced, there are typically severe impacts. Accidents due to snow and ice can result in property damage, personal injuries, and fatalities. Weather delays and inconveniences also play a role in driver attitudes and the overall quality of life for Moorhead residents.

Included in the manual are guidelines and instructions for the snow and ice control program for the City of Moorhead, Minnesota. For more detailed information concerning our snow and ice control program, please don't hesitate to contact us.

Steve Moore
Public Works Director
City of Moorhead

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**CITY OF MOORHEAD
PUBLIC WORKS DEPARTMENT**

November, 2019

SECTION 1: SNOW AND ICE CONTROL PROCEDURES

The purpose of this Snow and Ice Control Manual is to establish the City’s policy and level of service with respect to snow and ice control of the City’s road system during winter months. It will also serve as a practical guide for cost effective snow and ice removal operations. This manual supersedes all previously written policies of the City for snow and ice control operations.

1. IMPLEMENTATION

This manual will be in effect during normal winter operations at times when weather conditions could cause accumulation of frost, sleet, ice, snow or other occurrences on the streets and public parking lots in the City of Moorhead.

2. DEFINITION OF SUPERVISOR

When “Supervisor” is used in this manual it is defined as the person who is on duty at the time directing snow and ice removal operations for the Department of Public Works. These individuals include: Public Works Director, Operations Division Manager, Street Crew Chief, Heavy Equipment Operator Crew Chief, and/or any other individual who may be assigned the responsibility of Supervisor.

3. WEATHER FORECASTING

Weather information is essential for good planning of snow and ice control operations and other weather-related emergencies. The City will rely on local news stations and the National Weather Service for weather forecast information. Public Works will use this information to determine what impact present and forthcoming weather will have on overall operations. The City will also continue to rely upon information from the City of Moorhead Police Department, and the Minnesota Department of Transportation as it relates to snow and ice conditions during the winter months.

4. MONITORING AND NOTIFICATION OF ICE AND SNOW ACTIVITY

Public Works staff will monitor anticipated weather. They will coordinate with each other regarding the event intensity and winter maintenance procedures. During off-duty hours, weekends and holidays, the on-call Public Works Supervisor will monitor weather and road conditions. In the event of inclement weather, the on-call Supervisor will initiate the appropriate response action.

5. COMMUNICATIONS

All operators of snow and ice control equipment will keep in communications with the Public Works Supervisor at all times. The Public Works Supervisor on duty will be the main line of communication between the Public Works Department and the Police Department and/or dispatch. The Police Department will assist in advising the Public Works Department of current road conditions. It will be the sole responsibility of the Public Works Supervisor to direct winter maintenance operations for the City of Moorhead.

The Public Works Department will coordinate with City Hall for media notifications of emergency parking bans, snow emergency declarations, road closures, and other contact for inquiries regarding road conditions.

6. CITIZEN INQUIRIES

All citizen issues concerning snow and ice control efforts will be routed to the Public Works Department. The Public Works Director will determine appropriate follow-up responses to citizen inquiries.

7. INTERSECTION RIGHT-OF-WAYS

After periods of extraordinary snow events, the City may elect to haul snow from designated intersecting right-of-way to minimize sight obstructions. The decision to initiate this operation will be dependent upon the depth and accumulation of snow and analysis by the Public Works Department for any significant sight restriction issues. Operational priorities will be assigned to intersections based on street classification, traffic volumes and severity of sight restrictions. Snow will only be removed from intersections where a public street intersects another public street. This operation will typically be conducted after other higher priority post storm activities have been completed. Under normal circumstances, hauling of snow will be conducted during normal Public Works hours. Snow removal from the rights-of-way into private property driveways will be the responsibility of the adjacent private property owner.

8. BOUNDARY STREET JURISDICTION AND RESPONSIBILITY

The following table outlines the responsibility each agency has on roads bordering City of Moorhead corporate limits. The agencies listed below have first response maintenance responsibility on these roads. If the City has its snow routes open and boundary streets have not been cleared, the City may assist based upon the judgement of the Supervisor on duty, with the exception of the Interstate.

Boundary Streets

Street Segment	Responsibility
70 Ave N (County 93)	Clay County
Broadway St N (County 1)	Clay County
Wall Street Ave N (County 22)	Clay County
Oakport St N (County 3)	Clay County
28 Ave N & points north (County 18)	Clay County
I-94	MnDOT
8 St S from 24 Ave S & points south	MnDOT

9. PRIORITIES FOR SNOW AND ICE CONTROL OPERATIONS

In order to make the most efficient use of available resources, we have established priorities assuming the severity of a storm is not beyond the normal capabilities of City snow and ice removal resources. Depending on the nature of the snowstorm, deviations could occur. The established priorities are as follows:

- | | |
|---|------------|
| Primary Snow Routes | 1 Priority |
| Secondary Snow Routes
*Includes streets along primary entrances to schools if they are not on a primary or secondary route | 2 Priority |
| Residential Streets | 3 Priority |
| Alleys and Unimproved Streets | 4 Priority |

10. EMERGENCIES

Emergencies are defined as follows, but not necessarily limited to:

1. Immediate need for police, fire and/or emergency medical assistance. If the City emergency personnel must leave the public right-of-way to respond to an emergency, snow removal crews may provide necessary assistance such as opening a driveway or parking area to provide access.
2. Isolated problem areas where access is urgently needed before all other areas are handled.
3. Icy conditions due to a water main break or clearing of streets due to debris blocking street or access.

11. SNOW AND ICE CONTROL OPERATIONS

The depth and timing of snow accumulations, weather forecasts and traffic volumes will normally dictate when snow plowing operations will begin. Plowing will take place during a storm as needed in an attempt to keep accumulation on the pavement surfaces less than desired guidelines.

Snow and ice control operations are conducted in four phases:

- Anti-Ice Phase
- Phase I Operations: Primary and Secondary Snow Emergency Routes
- Phase II Operations: City-wide Plowing
- Phase III Operations: Daily Maintenance Routes

Details of each phase are further outlined in Sections 2-5 of this manual. During a typical snow event, Phase I and Phase II will take approximately 10-14 hours to complete.

12. USE OF SALT AND ABRASIVE MATERIALS

The City will use a variety of salt, treated salt, and sand/salt mixes, and sand for deicing and traction control applications. The type of de-icing material will depend on the street priority, pavement temperature, and overall weather conditions.

Treated salt has the capability to melt ice at lower pavement temperatures. Treated salt will be used primarily on bridges, around schools, and at intersections on primary routes where traffic is heaviest. Salt/sand equipment and snow plows equipped with salt/sand capability will also use pre-wetting to activate the salt and reduce scatter on the road surface. Pre-wetting reduces overall application rates and material waste. Based upon conditions, Supervisors will have discretion as to what deicer materials are used during a respective storm event.

Guidelines for use of anti-icing and de-icing materials are outlined in Section 2 and 3. These guidelines are provided as a starting point for planning prior to a snow event. Deviations may occur, as directed by the Operations Division Manager or Public Works Director, depending on weather conditions.

13. GPS TRACKING

All snow and ice removal assets will be equipped with GPS to provide real-time tracking of snow and ice removal operations. GPS data will be used to evaluate route efficiency and will be included in Situation Reports (SITREPs) as outlined in Section 10.

14. WIND ROWS

The Department of Public Works may elect to place wind rows to reduce the potential for blowing snow to accumulate on the road surface. The City will have sole discretion as to when and where to place wind rows. Wind rows will typically be placed in the following locations listed on the next page:

Wind Row Locations

Street Segment	Range	Side of Street
15 Ave N	14 St to Hwy 75	North
13 Ave N	18 St to 18 ½ St	North
8 Ave N	Hwy 75 to 28 St 33 St to 34 St	North North
28 St N	15 Ave to 2 Ave	West
18 Ave S	8 St to 9 St	North
11 St S	12 Ave to 18 Ave	West
12 Ave S	10 St to 11 St 40 St to 45 St	South North
24 Ave S	SE Main to 33 St 42 St to Dorothy Dodds Horizon Park to 45 St S	North North South
40 St S	24 Ave to Sanford Hardees to 36 St	Both sides North
36 St S	24 Ave to 28 Ave	Both sides
34 St S	24 Ave to 28 Ave	West
28 Ave S	Water tower to 26 St Menards to SE Main	North North
26 St S	20 Ave to 28 Ave	West
30 Ave S	11 St to 12 St 13 St to Muscatell Collision	North North
36 Ave S	17 St to 20 St	South
23 St S	Parkview Dr to 40 Ave	West
40 Ave S	20 St to 23 St	North
46 Ave S	6 St to Hwy 75	North

15. MANPOWER AVAILABLE

The primary staffing for snow removal and ice control will be supplied by the Public Works Department. Most snow events will be handled during a single 10- to 14-hour shift. However, for an extreme or extended storm event the Public Works Director may direct 24-hour operations using manpower from Forestry, Parks Maintenance, Fleet Maintenance, or lastly from Sanitation. If additional manpower is still required, the Public Works Director may request assistance from the Engineering Department. 12-hour shifts are outlined in Section 9.

16. TYPE OF EQUIPMENT

Equipment available to remove snow and ice from streets, City maintained sidewalks/trails, and public parking lots will be supplied by the Public Works Department and/or its contractors. Equipment is listed in Section 7.

17. EQUIPMENT MAINTENANCE AND REPAIR

As in all maintenance operations, successful snow and ice control depends upon the skillful use of manpower, personnel, equipment, and material. The efficient and economical control of ice and snow depends on the availability and use of the proper equipment. It involves a well-planned program executed throughout the year. It also includes a program of routine inspection, maintenance, and repair of equipment used in snow removal operations. As such, the City will typically schedule a mechanic to be on duty in its shop located at the Public Works Facility whenever the 12-hour shift assignments go into effect.

18. TOWING VEHICLES ILLEGALLY PARKED-DECLARATION EMERGENCY PARKING BAN

Cars parked on the streets during a snow removal effort may be ticketed and/or towed away in accordance with Section 5-2-6-3 Snow removal and Section 5-2-6-7 Impounding Vehicles Snow Removal of the City Code dated 2013 as amended. A snow emergency parking ban may be declared by the City Manager upon a recommendation from the Public Works Director or the Operations Division Manager. The Police Department and media will be notified when the parking ban is initiated.

19. SIDEWALK – PRIVATE RESPONSIBILITY

All sidewalks adjacent to private property are the responsibility of the property owner. The City’s responsibility is to plow the streets and keep them open to traffic. Due to the location of some sidewalks and the volume of snow being moved off the streets, there may be occurrences when plowing operations may deposit significant amounts of snow onto the sidewalks. When this occurs, it is the responsibility of the adjacent property owner to remove all snow from the sidewalk. City ordinance requires that snow and ice must be removed from the sidewalks prior to 9 pm each day. If snow and ice are not removed, it may be removed by City personnel, with costs for snow removal and an administrative fee assessed against the property. All complaint calls about sidewalks not being cleared will be routed to Neighborhood Services for complaint follow-up and code enforcement.

20. DRIVEWAYS – PRIVATE

City snow plows will not clear private driveways except under emergency conditions and with the approval of the Supervisor on duty. The snow placed in driveways by the City plows is the responsibility of the property owner to remove. Snow from a private driveway may not be placed on or pushed across a City street in accordance with Section 8-1-5-B Depositing Snow on Streets of the City Code dated 1994 as amended.

21. PLOWING PRIVATE PROPERTY

The City will not plow or clear snow or ice from private property unless it must be done to allow emergency vehicles access to private property for Fire, Police, or EMS calls.

22. MAILBOXES

The City will typically plow snow within the confines of curb line to curb line of a street. During frequent periods of heavy snowfall accumulations when storage areas for snow on the right-of-way are limited, there may be times when the City plows cannot physically place the snow from the curb line of the street up onto the adjacent City right-of-way. The adjacent resident will be responsible for cleaning snow around their mailbox to assure delivery of mail. The resident is also responsible for assuring that the mailbox is properly installed as required by the United States Postal Service Guidelines. This requires the face of the mailbox to be installed 6" behind the back of the curb and it should be constructed to be able to withstand snow cleaning efforts by the City. During preliminary routine inspections, City staff will typically notify citizens when potential problems are observed with the location or if improvements to the structural integrity of their mailboxes need to be made prior to winter plowing operations. It will be the responsibility of the residents to properly relocate or improve the structural integrity of the mailbox prior to winter plowing operations. The City will document the mailbox locations that have been tagged for improvements. The City will not be responsible for damage to mailboxes which have not been relocated or repaired after the notification has occurred.

23. SITUATION REPORTS (SITREPS)

The Public Works Director will provide a SITREP to the City Manager after each snow event. This record should contain operating times, weather conditions, and resources committed. An example SITREP is contained in Section 10.

24. DISCLAIMER

This Manual may be affected by at least one or more of the following events which could delay or alter snow and ice control by the City:

1. Equipment breakdown
2. Vehicles disabled in deep snow
3. Weather so severe as to cause work to be stopped for the safety of all personnel
4. Unforeseen conditions and emergencies
5. Significant medical related emergencies

26. DISTRIBUTION OF MANUAL

This manual shall be distributed to the following:

- A. Mayor and City Council
- B. City Manager
- C. Public Works Director
- D. Assistant City Manager
- E. City Clerk
- F. City Attorney
- G. Public Works Supervisors
- H. Chief of Police
- I. Director of Parks and Recreation
- J. Park Maintenance Supervisor

- K. Fire Chief
- L. Code Enforcement Division
- M. EMS/Red River Dispatch
- N. Finance Director

SECTION 2: ANTI-ICE OPERATIONS

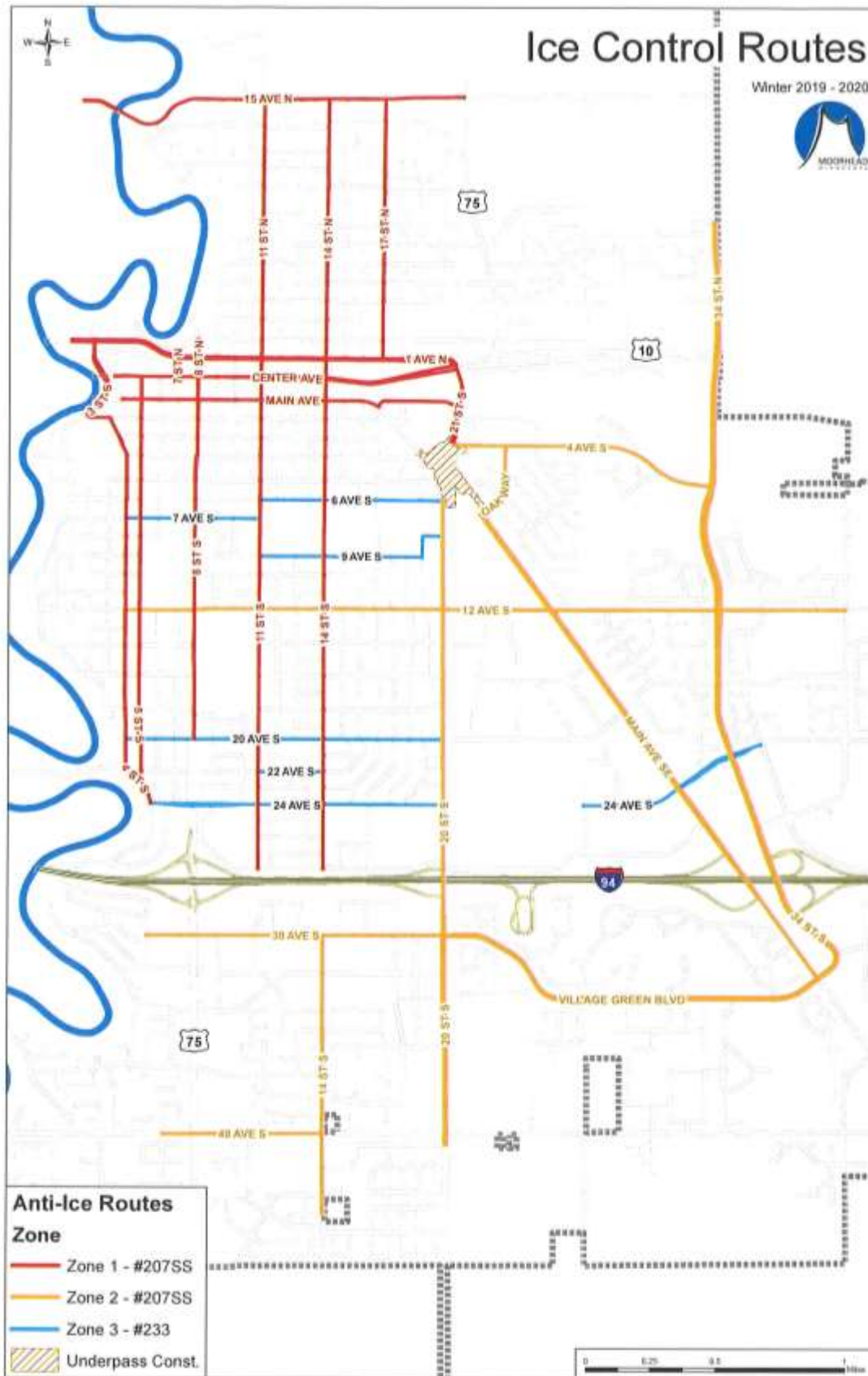
Anti-icing is a proven technique to improve road conditions during snow and ice events and improves effectiveness of plowing after snow and ice events. The primary goal of anti-icing is to break the bond between the snow/ice and the pavement surface. Anti-icing is not used to melt snow or ice. A brine solution blended with a carbohydrate additive is used depending on pavement surface temperature. Public Works will coordinate and obtain anti-icing material from the City of Fargo Public Works Department. Anti-icing will take place prior to a snow or ice event if the appropriate weather and road conditions exist. Anti-icing will be conducted along anti-ice routes (see map on following page) and typically when streets are dry, winds are less than 15 mph and there is no blowing snow. Anti-icing will not be completed before every event. If winds are too strong, temperatures are too low, roads are too wet, or there is snow pack on the road surface, anti-icing is not effective. The Operations Division Manager or Public Works Director will have discretion as to what materials are used and when they are applied.

Anti-Ice Equipment

Unit #	Description	Capacity (gallons)
233	2013 Ford F550 Flatbed	1,000
207SS	2018 Mack GU713/STEPP	3,000

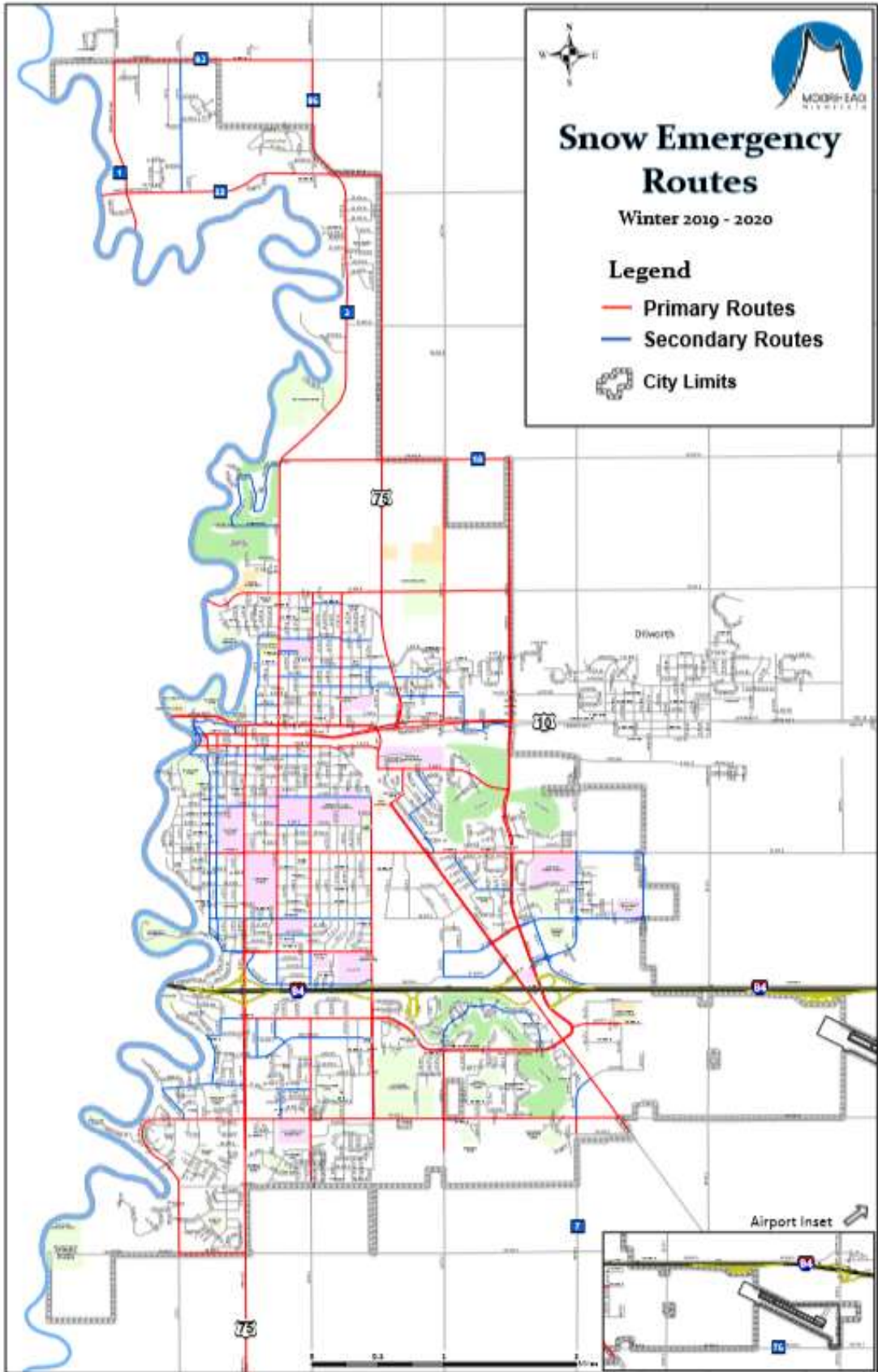
PAVEMENT	APPLICATION OPERATION			
Surface Temperature	Pavement Surface Conditions	Weather Conditions	Application Action	Gallons Per Lane Mile
Above 32° F, (Temp. is Steady or Rising)	Dry	Clear	Apply Salt Brine	54
20° - 32° F,	Dry	Clear	Apply Blend 95% Salt Brine 5% AMP	54
20° - 32° F,	Dry	Light Snow/Wind Speed < 15 mph With No BS	Apply Blend 95% Salt Brine 5% AMP	54
20° - 32° F,	Dry	Light Snow/Wind Speed > 15 mph With Visible BS	Do not Apply Liquids	0
14° - 20° F,	Dry	Clear	Apply Blend 92.5% Salt Brine 7.5% AMP	54
14° - 20° F,	Dry	Light Snow/Wind Speed < 15 mph With No BS	Apply Blend 92.5% Salt Brine 7.5% AMP	54
14° - 20° F,	Dry	Light Snow/Wind Speed > 15 mph With Visible BS	Do not Apply Liquids	0
0° - 14° F,	Dry	Clear	Apply Blend 90% Salt Brine 10% AMP	54
0° - 14° F,	Dry	Light Snow/Wind Speed < 15 mph With No BS	Apply Blend 90% Salt Brine 10% AMP	54
0° - 14° F,	Dry	Light Snow/Wind Speed > 15 mph With Visible BS	Do not Apply Liquids	0
Below 0° F,	Dry	Clear	Do not Apply Liquids	0

Anti-Ice Application Guidelines



SECTION 3: PHASE I – PRIMARY AND SECONDARY ROUTES

- Plowing primary and secondary routes occur shortly after snow falls and as snow begins to accumulate in excess of 1-2”
- Our goal is to keep the busiest streets that carry the most traffic as clear as possible before moving on to residential areas
- Several passes on the primary and secondary snow routes may be completed during a prolonged snow event if necessary
- In addition to plowing, salt/sand trucks will apply salt, salt/sand, or sand (depending on the temperatures and conditions) to the intersections along primary and secondary routes and on bridges
- Treated salt may be used in certain circumstances where temperatures are lower and on bridges where persistent melting is required to improve safety and prevent freezing
- Snow is moved from the center of the street to the curb in the direction of traffic and placed as equitably as possible on the boulevards
- A map of the primary and secondary snow emergency routes is provided on the next page



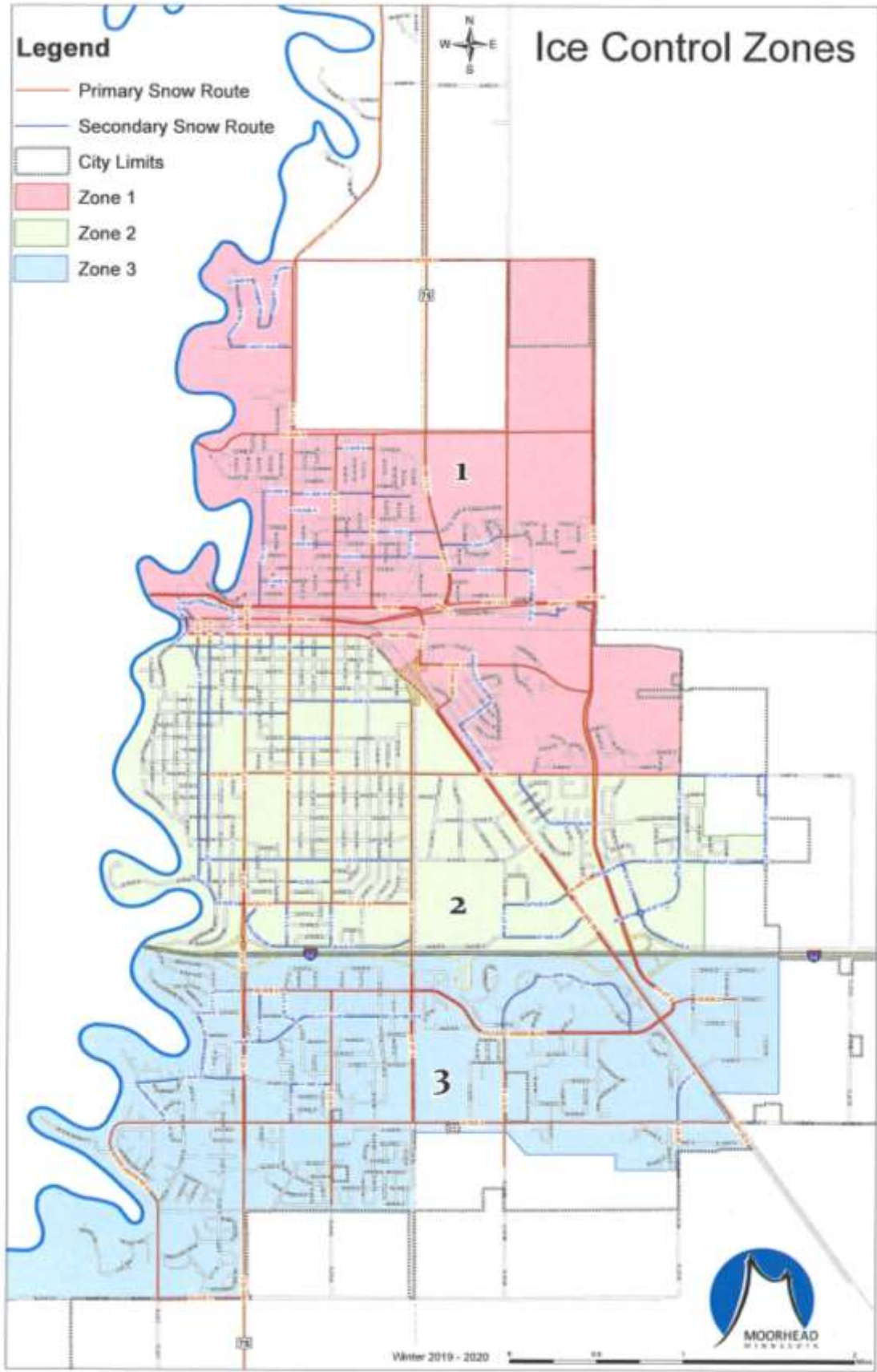
Salt/Sand Operations

Salting and/or sanding occurs both during and immediately after a snow or ice event on the primary and secondary snow routes. The objective of ice control materials like salt (NaCl, MgCl₂, CaCl₂, or pre-treated salt) is to break the bond between the pavement and snow and ice. This allows snow plows to remove more snow and ice and expose more pavement surface. Sand provides traction only and is only effective at intersections and low speed areas during colder pavement temperatures. The proportion of salt and sand will depend on temperature. Additionally, salt trucks are equipped with liquid brine tanks/applicators to pre-wet the salt and activate it as it exits the spreader. Pre-wetting improves the effectiveness of salt and reduces the scattering of salt off the driving surface. Snow and ice removal crews will not salt and/or sand residential streets after the initial snow is cleared. Residential streets will be treated with salt and/or sand only in higher traffic areas and where residential streets feed into primary or secondary snow removal routes. After plowing is completed, continued salt, and/or sanding operations on primary and secondary routes will continue using the (3) ice control zones outlined on the next page.

Application Rates for Salt, Salt/Sand, and Sand

Pavement Temperature at Product Application	Pavement Temperature Condition	Pavement Surface Condition	Application Rate		Product
			Gallons/ Pounds Per Lane Mile	Liquid Pre-Wet at Spinner (80/20 Brine/AMP)	
Above 32° F	Temp. is Steady or Rising <i>(No Blowing Snow)</i>	Frost	54	NA	100 Brine
22° F to 32° F	Temp. is Steady or Rising <i>(No Blowing Snow)</i>	Frost	54	NA	90/5 Brine-AMP
22° F to 32° F	Temp. is Steady	Light Compaction/Ice	200	Yes	Salt
22° F to 32° F	Temp. is Steady	Mild Compaction/Ice	300	Yes	Salt
15° F to 22° F	Temp. is Steady	Light Compaction/Ice	200	Yes	Salt
15° F to 22° F	Temp. is Steady	Mild Compaction/Ice	400	Yes	Salt
0° F to 15° F	Temp. is Steady	Light Compaction/Ice	200	Yes	50% Sand / 50% Salt Mix
0° F to 15° F	Temp. is Steady	Mild Compaction/Ice	300	Yes	50% Sand / 50% Salt Mix
Below 0° F	NA	NA	800	Yes	80% Sand / 20% Salt Mix

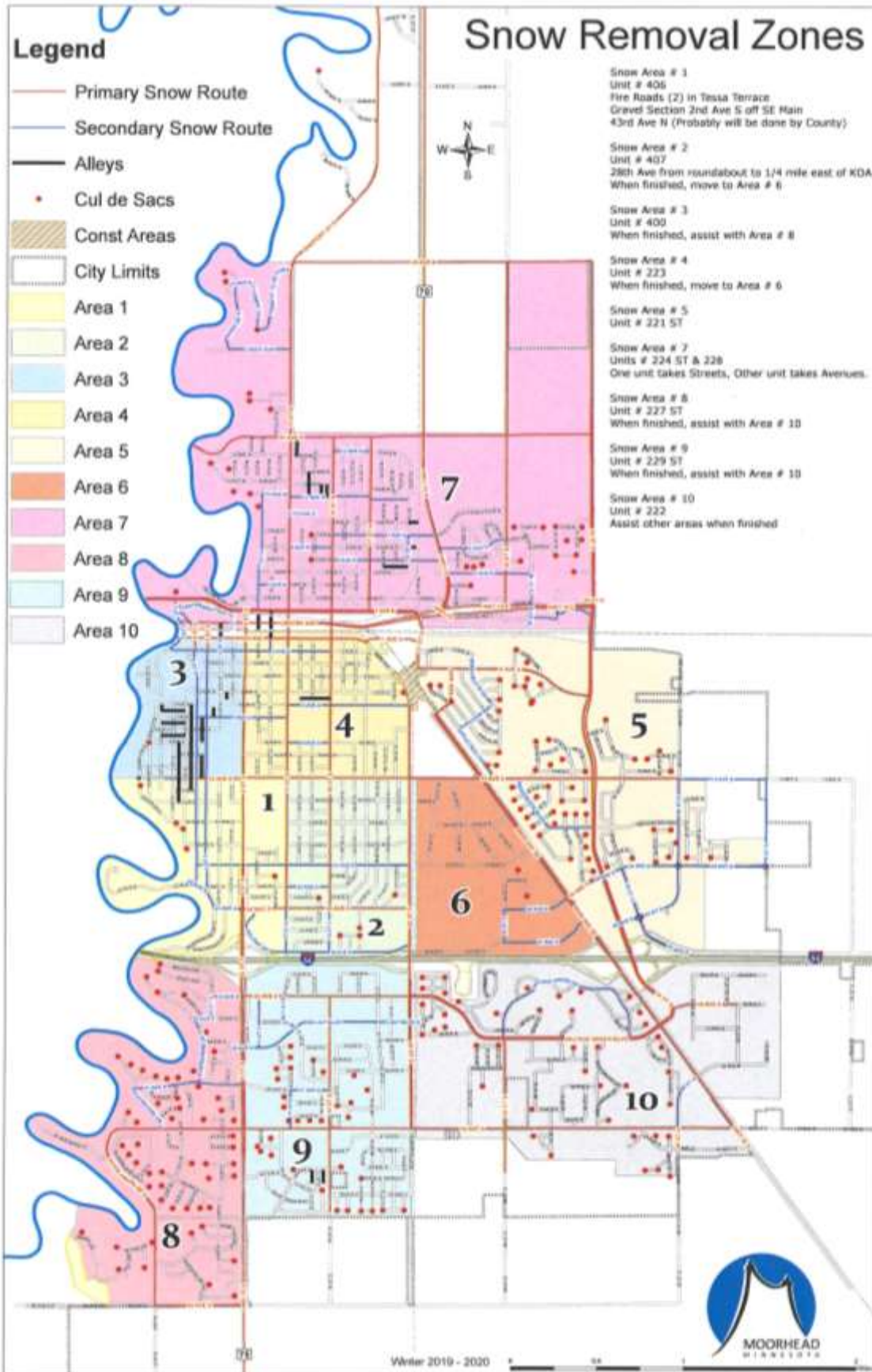


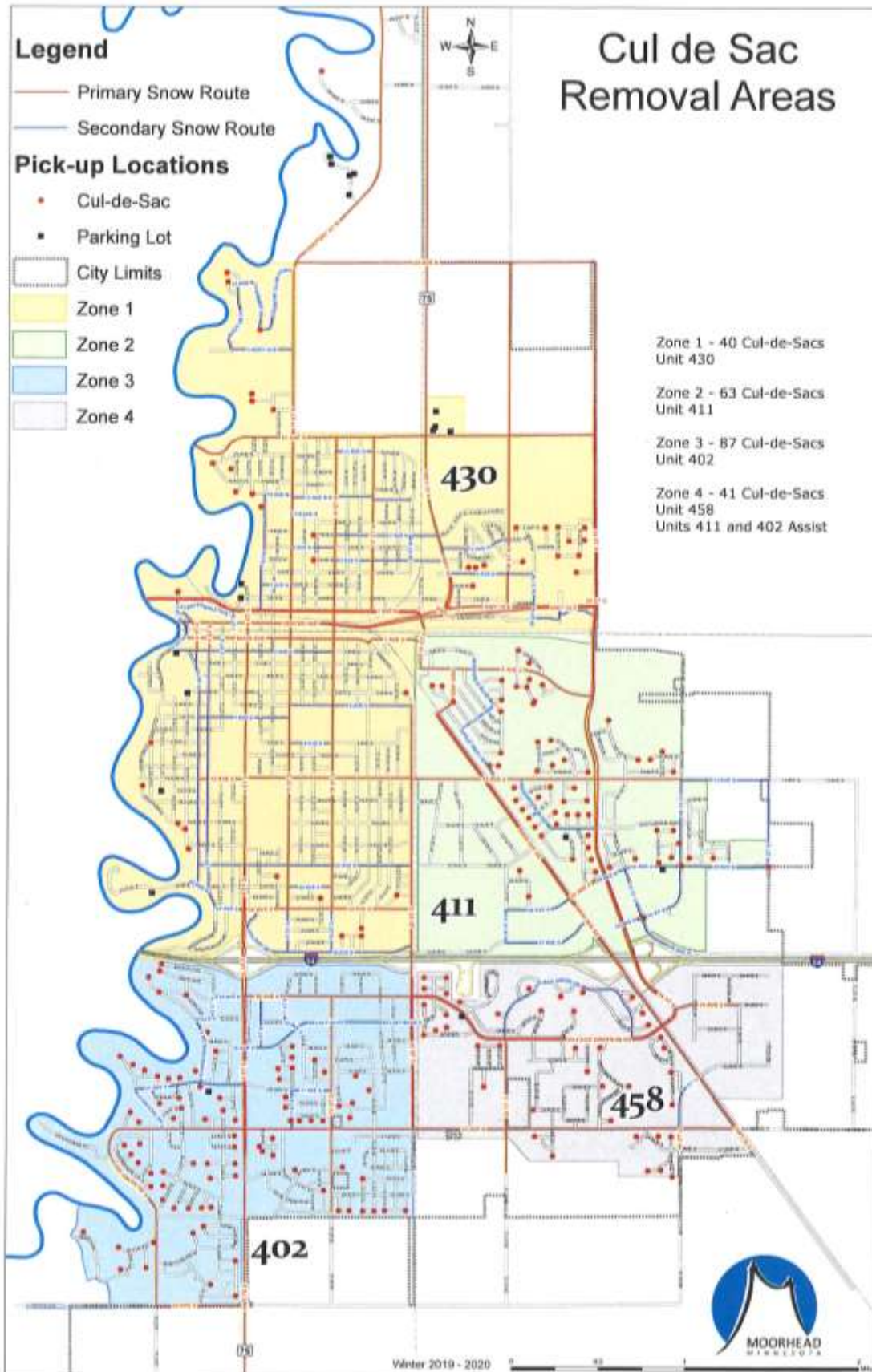


SECTION 3: PHASE II – CITY-WIDE PLOWING

- After the snow stops, crews begin plowing the 10 snow removal zones (see map on page 20). The goal is to complete an initial pass on both sides of all streets within 24 hours after the end of the event.
- The Oakport Neighborhood is plowed by Master Construction as agreed upon as part of the annexation of Oakport in 2015
- The objective of the first pass on residential streets is to provide clear driving lanes quickly as possible, which may result in snow not being pushed all the way back to the curb
- Equipment will return on daily maintenance days to push back snow closer to the curb
- Additional snow events may impact daily maintenance route as crews will be clearing new snow
- Typically, city-wide plowing will start between midnight and 4 am (depending on the estimated end time of snowfall)
- Depending on the amount of snowfall, it takes crews 10-14 hours to clear all City streets
- Typically, salt or salt/sand, will not be applied in residential areas. Use of ice control may be used on residential streets intersecting primary or secondary routes.
- Public Works staff will not clean private driveways or sidewalks
- Plows will not return if a car is left on the street with snow plowed around it until the scheduled daily maintenance day
- Gravel alleyways will be plowed by a street maintenance pick-up plow. Plowing on alleyways will be limited in the fall and spring if the ground/gravel is not frozen.
- City parking lots and pedestrian sidewalks on Center Ave and 15 Ave N bridges
 - City parking lots will be cleared by a contractor
 - Sidewalks on the Center Ave and 15 Ave N bridges will be cleared by a contractor
 - Requests for quotes will be sent out prior to the start of each snow season
- Process for cul-de-sacs
 - Cul-de-sacs are plowed using front end loaders with snow pushers
 - There are four cul-de-sac removal zones assigned to four front end loaders (see map on page 21)
 - Due to the amount of snow in cul-de-sacs, operators will attempt to evenly distribute the snow; however, due to some cul-de-sac designs having little or no boulevard available and some yards may receive more snow than others
 - Small snow events: Snow is plowed to the outside curb
 - Large snow events (typically events 8” or greater): If an snow event is predicted to accumulate snow greater than 8”, the Public Works Director may direct crews to push snow to the center of the cul-de-sac to be hauled away later
 - Hauling snow may take 1-2 weeks depending on future snow events. Hauling snow may take 1-2 weeks depending on future snow events
- Process for Bike/Pedestrian Paths and City-maintained sidewalks
 - We have 46 miles of bike paths and City-maintained sidewalks (see map on page 22)
 - Parks Maintenance crews will begin clearing after the snow fall ends, typically starting at the beginning of the next regularly scheduled workday at 7 am

- Park parking lots will be cleared after all bike paths and sidewalks are completed. Street maintenance front end loaders will assist after the streets and cul-de-sacs are completed.
- Our goal is to clear these areas within 24 hours of the end of snow event
- It may take 48-72 hours after heavy snowfall events if there is too much snow for pickup truck/Toolcat plows and brooms. The process takes much longer if we need to use snow blowers to clear paths and sidewalks.
- Stakes are sometimes placed to identify curb locations to equipment operators. Please do not remove them.

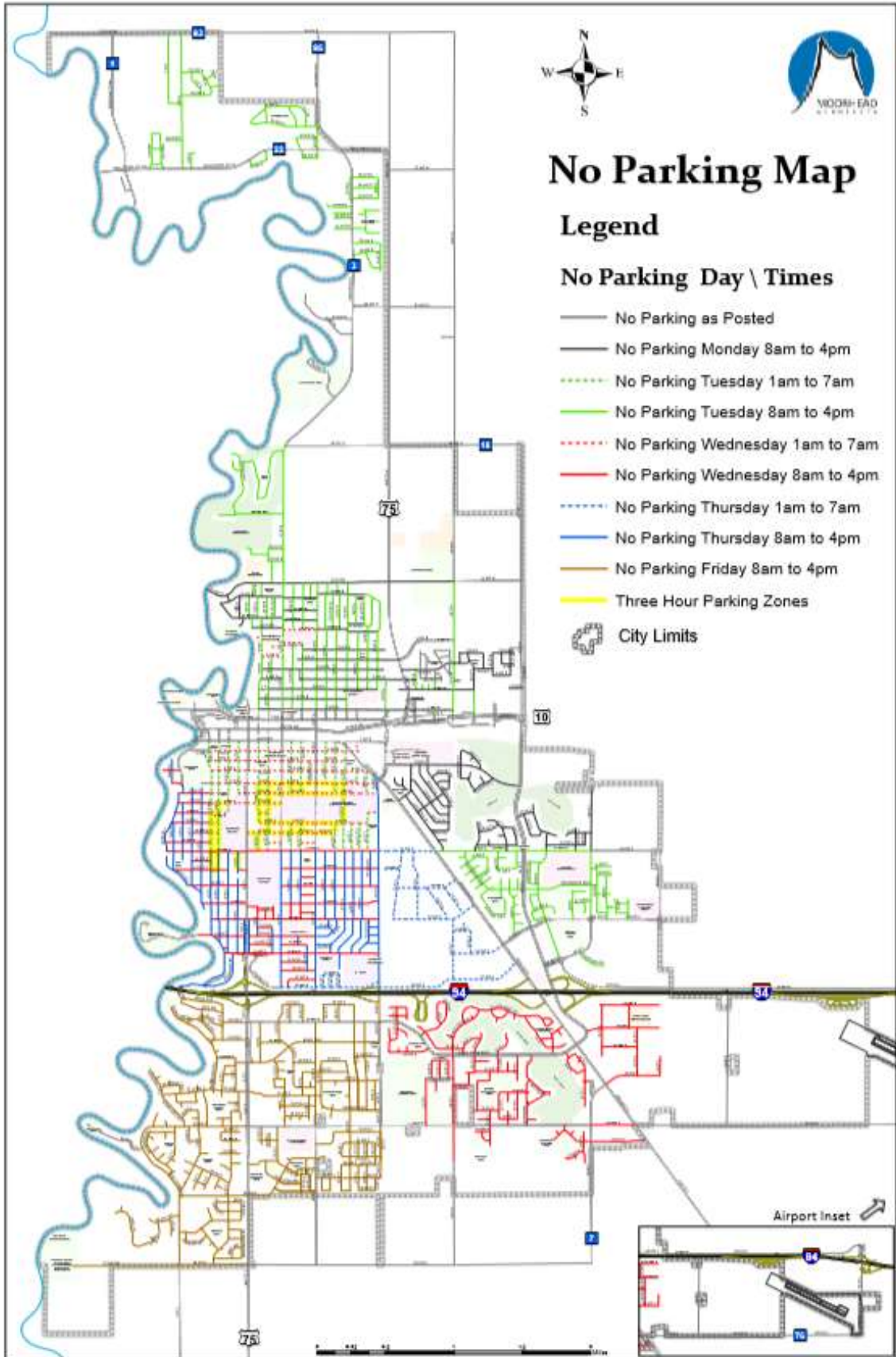






SECTION 5: PHASE III – DAILY MAINTENANCE

- After the initial clearing, a second pass will be made during the next scheduled street maintenance day (see map on the following page)
- Signs are posted on streets designating scheduled maintenance days
- Maintenance days may differ from garbage days. Daily maintenance routes don't always coincide with the time it takes to run garbage routes.
- Streets staff stay 1-2 feet away from mailboxes to prevent damage and will not plow out space around the mailbox
- Parked cars on the street will impact the ability of crews to plow closer to mailboxes and curbs
- If a holiday falls on a maintenance day, the second pass will occur on the next non-holiday maintenance day
- Crews do their best to minimize the snow left in driveways; but, there simply is no way to avoid or prevent accumulation of snow on driveways and sidewalks
- City crews do not clear snow from private driveways and sidewalks



SECTION 6: LEVELS OF SERVICE

In an effort to promote operational awareness, levels of service goals have been established for the various street classifications within the City's jurisdiction. While these goals have been developed by the Public Works Department based on various types of criteria, they are primarily defined for the benefit of the employees who have responsibility for performing the maintenance duties associated with snow and ice events throughout the winter.

Factors such as service level expectations, responsible use of deicer chemicals, road safety and budgetary considerations are just some of the criteria considered in the development of these goals. While the agency will strive to meet these goals, it is important to understand the time it may take to achieve them will be dependent upon weather conditions and other factors that may be outside the control of the City.

Primary Streets

(Significant Portion of Pavement is Bare)



Secondary Streets

(Some Bare Pavement – Focus on Wheel Tracks)



Residential Streets

(Streets will have residual snow – minimal bare pavement)



Unimproved Streets/Alleys

(Plowed Only – Minimal Bare Pavement)



SECTION 7: EQUIPMENT ASSIGNMENTS – STREET MAINTENANCE

During normal operations, equipment assets are assigned to the following operators. This list is provided as a guide and will be modified based on vacation, sick leave or other changes required to complete the mission.

Zone	Unit #	Operator	Call Sign	Equipment Type
Snow Removal Zones				
Area 1	406	HEO	406	Motor grader w/wing
Area 2	407	HEO	407	Motor grader w/wing
Area 3	400	HEO	400	Motor grader w/wing
Area 4	223	Truck Driver	223	Tandem axle plow w/wing
Area 5	221ST	Truck Driver	221	Tandem axle plow w/wing + salt/sand
Area 6	First zone complete will start Zone #6			
Area 7	224ST	Truck Driver	224	Tandem axle plow w/wing + salt/sand
Area 7	228	Truck Driver	228	Tandem axle plow w/wing
Area 8	227ST	Truck Driver	227	Tandem axle plow w/wing + salt/sand
Area 9	229ST	Truck Driver	229	Tandem axle plow w/wing + salt/sand
Area 10	222	Golf Course Tech	222	Tandem axle plow w/wing
Cul-de-Sac Removal Areas				
Zone 1	430	HEO Crew Chief	430	Front end loader w/ snow pusher
Zone 2	411ST	HEO	411	Front end loader w/ snow pusher
Zone 3	402ST	HEO	402	Front end loader w/ snow pusher
Zone 4	458	Park Tech	458	Front end loader w/ snow pusher
Alleys				
Multiple	215	Street Crew Chief	215	1-ton w/salt hopper/spreader/plow
Salt/Sander				
Zones 1/2/3	225	Golf Course Tech	225	Tandem salt/sand truck
Zones 1/2/3	226	Variable	226	Tandem salt/sand truck
Anti-Icing				
Zones 1/2	207SS	Assigned as needed	207	3,000-gallon anti-icing tTruck
Zone 3	233	Assigned as needed	233	1-ton w/500 gallon anti-icing tank
Spares				
	220			Tandem axle plow w/wing
	221			Tandem axle plow w/wing
	229			Tandem axle plow w/wing

SECTION 8: EQUIPMENT ASSIGNMENTS – PARKS MAINTENANCE

During normal operations, the following equipment assets are assigned to operators to control snow and ice on bike/pedestrian paths, City-owned sidewalks, and park parking lots. This list is provided as a guide and will be modified based on vacation, sick leave or other changes required to complete the mission.

Function	Unit #	Operator	Call Sign	Equipment Type
Bike/Ped Paths	254PM	Park Tech	254	Pickup Truck w/V-Plow
Bike/Ped Paths	873RM	Park Tech	873	Pickup Truck w/V-Plow
Sidewalks	857PM	Park Tech	857	Toolcat w/plow/broom/blower
Sidewalks	494PM	Park Tech	494	Toolcat w/plow/broom/blower
Ice Rinks	821RM	Park Tech	821	Ventrac w/cab/blower/broom
Ice Rinks	854RM	Park Tech	854	Ventrac w/cab/blower/broom
Park Parking Lots	458	Variable	458	Front End Loader w/Snow Pusher

SECTION 9: 12-HOUR SHIFT SCHEDULE

If a snow event is predicted to last several days, the Public Works Director or Operations Division Manager may establish the implementation of a 12-hour shift schedule. This schedule is for extreme storm events, not for sustained 24/7 operations.

1. **SNOW SHIFTS WILL BE FROM 8:00 A.M. TO 8:00 P.M., AND 8:00 P.M. TO 8:00 A.M.**
2. **IN CASE OF AN EMERGENCY STORM DURING SHIFT CHANGE, THE EXISTING SHIFT ARRANGEMENT WILL HOLD UNTIL SNOW IS REMOVED.**

DATES	TIME	DAY SHIFT	NIGHT SHIFT	NIGHT MECHANIC
Monday, October 30 thru Sunday, November 19	4 weeks	2	1	Mechanic 1
Monday, November 20 thru Sunday, December 10	4 weeks	1	2	Mechanic 2
Monday, December 11 thru Sunday, December 31	4 weeks	2	1	Mechanic 3
Monday, January 1 thru Sunday, January 21	4 weeks	1	2	Mechanic 1
Monday, January 21 thru Sunday, February 11	4 weeks	2	1	Mechanic 2
Monday, February 12 thru Sunday, March 4	4 weeks	1	2	Mechanic 3
Monday, March 5 thru Sunday, March 25	4 weeks	2	1	Mechanic 1
Monday, March 26 thru Sunday, April 15	4 weeks	1	2	Mechanic 2
Monday, April 16 thru Sunday, May 6	4 weeks	2	1	Mechanic 3

If snow/ice conditions are developing at a time other than during the Public Works Department's regular business hours, contact on-call personnel (reference Public Works Department On-Call Schedule). If there is no response after 10 minutes, use the following numbers to contact the appropriate Shift Supervisor:

Shift 1	Cell	Shift 2	Cell
Street Crew Chief		HEO Crew Chief	

*12-Hour Operation Assignments
Shift 1*

Zone	Unit #	Operator	Call Sign	Equipment Type
Snow Removal Zones				
Area 1	406	HEO	406	Motor grader w/wing
Area 2	407	Street Crew Chief*	407	Motor grader w/wing
Area 3	400	HEO	400	Motor grader w/wing
Area 4	223	Forestry Truck Driver	223	Tandem axle plow w/wing
Area 5	221ST	Street Truck Driver	221	Tandem axle plow w/wing + salt/sand
Area 6	First zone complete will start Zone #6			
Area 7	224ST	Forestry Truck Driver	224	Tandem axle plow w/wing + salt/sand
Area 7	228	Sign Maintenance	228	Tandem axle plow w/wing
Area 8	227ST	Park Maintenance	227	Tandem axle plow w/wing + salt/sand
Area 9	229ST	Street Truck Driver	229	Tandem axle plow w/wing + salt/sand
Area 10	222	Fleet Mechanic	222	Tandem axle plow w/wing
Cul-de-Sac Removal Areas				
Zone 1	430	Forestry Crew Chief	430	Front end loader w/ snow pusher
Zone 2	411ST	Park Maint Crew Chief	411	Front end loader w/ snow pusher
Zone 3	402ST	HEO	402	Front end loader w/ snow pusher
Zone 4	458		458	Front end loader w/ snow pusher
Salt/Sander				
Zones 1/2/3	225	Golf Course Tech	225	Tandem salt/sand truck
Zones 1/2/3	226		226	Tandem salt/sand truck

***Crew Chief – Shift Leader**

*12-Hour Operation Assignments
Shift 2*

Zone	Unit #	Operator	Call Sign	Equipment Type
Snow Removal Zones				
Area 1	406	Park Maint Tech	406	Motor grader w/wing
Area 2	407	HEO	407	Motor grader w/wing
Area 3	400	HEO	400	Motor grader w/wing
Area 4	223	Street Truck Driver	223	Tandem axle plow w/wing
Area 5	221ST	Forestry Truck Driver	221	Tandem axle plow w/wing + salt/sand
Area 6	First zone complete will start Zone #6			
Area 7	224ST	Street Truck Driver	224	Tandem axle plow w/wing + salt/sand
Area 7	228	Forestry Tech	228	Tandem axle plow w/wing
Area 8	227ST	Street Truck Driver	227	Tandem axle plow w/wing + salt/sand
Area 9	229ST	Park Maint Tech	229	Tandem axle plow w/wing + salt/sand
Area 10	222	Golf Course Tech	222	Tandem axle plow w/wing
Cul-de-Sac Removal Areas				
Zone 1	430	Park Maint Tech	430	Front end loader w/ snow pusher
Zone 2	411ST	HEO Crew Chief*	411	Front end loader w/ snow pusher
Zone 3	402ST	Park Maint Tech	402	Front end loader w/ snow pusher
Zone 4	458		458	Front end loader w/ snow pusher
Salt/Sander				
Zones 1/2/3	225		225	Tandem salt/sand truck
Zones 1/2/3	226		226	Tandem salt/sand truck

***Crew Chief – Shift Leader**

SECTION 10: SITUATION REPORTS (SITREPs)

The Public Works Director will provide SITREPs to the City Manager prior to and after each snow event. An example of a SITREP is provided below.

SITREP

- Current conditions: Calm
- Current temp: -1 F/ Feels like -17 F
- Wind: NNW 5 mph
- Estimated snowfall at time of SITREP: approximately 10 inches
- Full operations began at 0200 and were completed at 1630. Long day for the crew, but they did an OUTSTANDING job!
- Operations took longer than normal due to the continued winds and the requirement to make multiple passes along the primary/secondary routes and the roads along the City perimeter
- Equipment on road:
 - (7) Plows: 220/222/224ST/227ST/228/229ST/229 (old spare – no GPS)
 - (1) Salter: 226
 - (3) Motor graders: 400/406/407
 - (3) Pay loaders with plows: 402ST/430/458
- (1) Pay loader with snow blower: 411ST Augmented street maintenance crews with Forestry (3) and Parks Maintenance (2)



SECTION 11: OPERATING INSTRUCTIONS AND SAFETY RULES

1. WORK HOURS

Work hours for snow events will be based on the timing and type of snow event. For major storm events, two 12-hour shifts will be established at the discretion of the Director of Public Work and/or Division Manager.

2. SAFETY PROCEDURES

Safety is a paramount during any snow storm. The following safety rules will be observed by all equipment operators.

- A. Check your snow removal equipment prior to leaving the yard and also the following:
 - 1) All work lights and emergency lights
 - 2) Two-way radio
 - 3) Snow plow and frame for damage
 - 4) Salt/sander (if applicable)
 - 5) Rear view mirrors
 - 6) Flags and reflectors
 - 7) Windshield wipers
 - 8) Heater and defroster
 - 9) All necessary mapping for snow and ice removal
 - 10) Vehicle inspection items
 - 11) Liquid dispensing apparatus (if applicable)
- B. Report any non-working equipment to a Supervisor immediately.
- C. Use reasonable caution in operation of snow removal equipment.
- D. Drive cautiously.
- E. Use caution when operating in cramped quarters with parked cars on a street.
- F. Know your route and any fixed objects covered by snow.
- G. Obey all traffic laws.
- H. Do not follow traffic too closely.
- I. Slow down prior to turning. Your plow will tend to push you where it wants to go.
- J. Equipment involved in snow and ice control operations is emergency equipment, but you as the operator, must obey all traffic laws and provide right-of-way to other vehicles.

3. ACCIDENTS

Report all moving vehicle accidents immediately to your Supervisor. Depending on the severity of the accident and availability due to storm related issues, the Police Department will typically be called to evaluate the accident. The safety of the operator and any individual involved in the accident is always the priority; however, if able the operator should take pictures to document the accident. If able, the operator should take pictures to document the incident. Prior to leaving duty on the shift, a Motor Vehicle Accident Report & Review shall be filled out. Your Supervisor will attempt to interview the driver at the end of the shift or within 24 hours after return to normal duties. Accident forms should be available from the on-duty Supervisor.

4. CARE AND USE OF EQUIPMENT

The snow plow operator is responsible for routine maintenance of the vehicle. Report any maintenance needed to the Supervisor or mechanic on duty. Check vehicle before and after use for any maintenance needed or damage to equipment. Fill out Operations Daily Inspection Check Sheet. The vehicle should be refueled at the end of each operator's shift.

5. RADIO COMMUNICATIONS

Operators are to take duty instructions from the Supervisor on duty. The Police may report road conditions or other issues to the Supervisor. It will be the role of the Supervisor to direct all winter maintenance related operations.

6. DAILY REPORT

Upon completion of the shift, operators will be required to fill out a Daily Report sheet. This sheet will document the date, unit #, route/zone covered, and material usage. If exact quantity is not known, material can be recorded by estimate, ie. 1 tandem load, ½ tandem load, etc. Mileage can be obtained from GPS data, so documentation is not required.

SECTION 12: APPLICABLE ORDINANCES

5-2-6-2: DECLARATION OF EMERGENCY TO THE PUBLIC:

A. Authority to Declare Emergency: The city manager, or other official authorized by this section, shall cause each declaration made pursuant to this section to be publicly announced by means of broadcasts or telecasts from stations with a normal operating range covering the city, social/electronic media and alerts, and other means when feasible. Each announcement shall describe the action taken by the city manager or other official authorized by this section, including the time it became or will become effective, and shall specify the streets or areas affected. A parking prohibition declared by the city manager, or other official authorized by this section, shall specify whether it is applicable to primary snow emergency routes, primary and secondary snow emergency routes, and/or snow removal district(s), and shall not go into effect until at least three (3) hours after it has been announced at least three (3) times between six o'clock (6:00) A.M. and eleven o'clock (11:00) P.M. on any day for snow emergency routes. For snow removal district(s), the above described announcements shall occur the day preceding normal no parking restricted streets and avenues in the district. The announcement shall advise the public that violators are subject to towing/impoundment for street cleaning. (Ord. 2013-10, 6-24-2013)

B. Records Maintained: The city manager, or other official authorized by this section, shall make or cause to be made a record of each time and date when any declaration is announced to the public in accordance with this section; said records to be kept for a period of sixty (60) days.

C. Termination of Parking Prohibition: Whenever the city manager, or other official authorized by this section, shall find that some or all of the conditions which give rise to a parking prohibition in effect pursuant to this section no longer exist, the city manager or other authorized official may declare the prohibition terminated, in whole or in part, in the manner prescribed by this section, effective immediately upon announcement.

D. Provisions Temporarily Effective To Take Precedence: Any provision of this section which becomes effective by declaration of the city manager, or other official authorized by this section, or upon the occurrence of certain weather conditions shall, while temporarily in effect, take precedence over other conflicting provisions of law normally in effect, except that it shall not take precedence over provisions of law relating to traffic accidents, emergency travel of authorized emergency vehicles or emergency traffic directions by a police officer. (Ord. 2012-12, 8-13-2012)

5-2-6-7: VIOLATIONS; IMPOUNDMENT:

A. Impound Vehicle, Fees:

1. Any vehicle stopped on any primary or secondary snow emergency route when an emergency declaration has been issued in violation of any of the provisions of this section [5-2-6](#) may be impounded, and no person shall recover any vehicle removed pursuant to this section without first paying the cost of removal and the cost of storage. (Ord. 2013-01, 1-14-2013)
2. Any vehicle stopped or parked within a designated snow removal district contrary to the posted regular street maintenance parking regulation when a snow removal declaration is issued may be impounded, and no person shall recover any vehicle removed pursuant to this section without first paying the cost of removal and the cost of storage. (Ord. 2014-17, 9-8-2014)

5-2-10: PENALTIES AND IMPOUNDMENT:

Any person violating any of the provisions of this chapter may be charged with an administrative offense pursuant to section [1-4-5](#) of this code, or alternatively, a criminal offense if a violation is committed in a manner or under circumstances so as to endanger or be likely to endanger any person or property. If charged with a criminal offense and convicted, the person shall be penalized in accordance with the provisions of section [1-4-2](#) of this code. The determination as to whether to treat a violation as an administrative offense or as a criminal offense shall be up to the discretion of the authority issuing the citation. Any vehicle parked in violation of any of the provisions of this chapter may be impounded, and no person shall recover any vehicle impounded pursuant to this section without first paying the impound fees and charges as established by the city's fee schedule. (Ord. 2015-19, 10-12-2015)

8-1-5: REMOVAL OF SNOW AND ICE:

Depositing Snow on Streets: No person engaged to move, blow or plow snow upon or off of any private property or city right of way within the city shall cause or permit any of the snow so removed, blown or plowed to be deposited upon any street within the city. The prohibition contained herein shall apply to the occupants of any such property, their agents, employees or independent contractors. The occupants of the premises or the persons requesting the snow to be removed or the persons who are actually removing the snow shall make suitable arrangements to deposit the removed snow in some place other than upon the city streets and snow shall not be piled so as to interfere with the vision of motorists approaching any intersection. Other than from adjacent sidewalks and driveways, no snow shall be placed upon the boulevards. (Ord. 94-20, 12-19-1994).