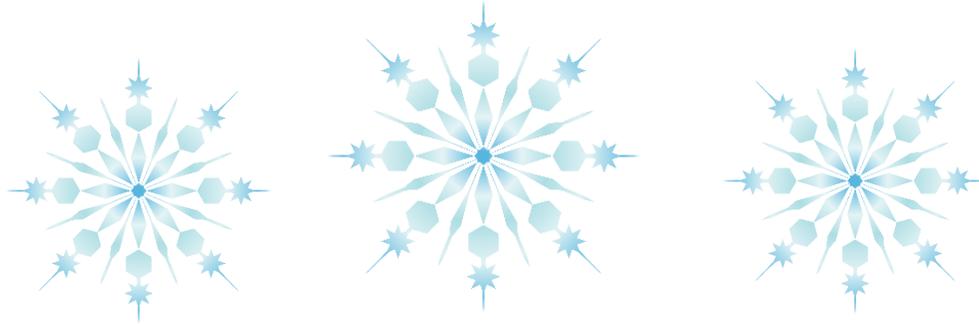


*Town of Carrboro
Public Works Department*



*Winter Weather Plan
2019 - 2020*

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I. Scope

The Public Works Department is primarily responsible for responding and reducing winter weather related roadway hazards associated with accumulations of ice or snow on roadway surfaces of Town maintained streets, facilities, designated bike paths and sidewalks, and parking lots.

Direct supervision of hazard reduction and snow removal operations is the assigned responsibility of the Director of Public Works, Public Works Superintendent, and/or the Shift A & B Supervisors.

The roadway hazard reduction program is designed to effectively utilize and commit available Town personnel and equipment resources as determined, and when deemed necessary, to be supplemented by local contractor forces and equipment when deemed essential.

The type of response, personnel, and equipment to be used and depth of commitment will be dependent on the type and severity of the winter storm and the known or anticipated future weather conditions. Response actions to specific conditions will be recommended by the Shift A & B Supervisors and approved by the Director of Public Works and/or the Town Manager.

II. Execution

The Winter Weather Plan is executed by the Director of Public Works and/or the Shift A & B Supervisors.

III. Headquarters

The Headquarters for the Winter Weather Operations is at the Public Works Facility located at 100 Public Works Drive (off of Smith Level Road).

- **Public Works Administration** – Office: 919-918-7425
- **Public Works Director, Joe Guckavan** – Office: 919-918-7427
- **Public Works Superintendent - Daniel Snipes** – Office: 919-918-7432
- **Shift A Supervisor, Dillon Dispennette** – Office: 919-918-7434
- **Shift B Supervisor, Chris Clark** – Office: 919-918-7433
- **Fleet Maintenance, Dustin Cook** – Office: 919-918-7429

Central Communications (Orange County Emergency Management Services (EMS) 911 or 919-732-5063

POLICE Department OFFICE

- Patrol Room: 919-918-7404 or 7403
- Main Office: 919-918-7397

POLICE Department:

- Capt. Tony Frye: 919-883-8389
- Capt. Chris Atack: 919-883-8394
- Chief Walter Horton: 919-883-8396
- **Shift 1** – Lt. Metz: 919-883-8385, Sgt. Trombley: 919-883-8387
- **Shift 2** – Lt. Thomas: 919-883-7396, Sgt. McKenzie: 919-883-8395
- **Shift 3** – Lt. Cannady: 919-883-8384, Sgt. Glenn: 919-883-8380
- **Shift 4** – Lt. Quick: 919-883-8382, Sgt. Armstrong: 919-883-8350

FIRE Department (911) or 919- 732-5063

- **Station #1 Main Office** - 919-918-7347
- Fire Chief - Office: 919-918-7349/Cell: 919-883-8342
- Fire Marshall/Interim Deputy Chief - Office: 919-918-7352/Cell: 919-883-8345
- Admin. Capt. - Office: 919-918-7359/Cell: 919-869-4092
- Carrboro Command Center - 919-918-7363
- PW EOC Desk - 919-918-4469
- Lieutenant Office – 919-918-7353

- **Station # 2** – Capt. Office – 919-913-2941 – Watch Room: 919-913-2940 or 919-913-2950
- Engine 1 Officer: 984-215-0084
- Engine 2 Officer: 984-234-1356
- Truck 1 (ladder) Officer: 984-234-1182

IV. Personnel

The Director of Public Works is responsible for designating personnel to specific job responsibilities for the implementation of the Winter Weather Plan.

The Public Works Superintendent will submit in writing each November a Personnel/Job Responsibility Listing to the Director of Public Works. The listing will include contact information for essential personnel listed. Upon approval by the Director of Public Works, the Personnel/Job Responsibility Listing shall replace Appendix A (pages 9-10) of the Winter Weather Plan.

The job responsibility categories for the implementation of the Winter Weather Plan are:

A/B.* Appendix A lists essential personnel designated for the implementation, coordination, and direct supervision of the winter weather plan and the direct supervision of the crews responsible for ice and snow removal of the Town streets. Personnel designated can operate on 12-hour shifts removing ice/snow from Town maintained streets, facilities, designated bike paths, sidewalks, and parking lots.

C. Personnel designated for the implementation of ice/snow removal operations for sidewalks, steps, and parking lots at the Town Hall (301 W. Main St.), Fire Station #1 (Town Hall), Fire Station #2 (Homestead Road.), Century Center, Police Department and Public Works facilities (off of Smith Level Rd.). Personnel designated to assist in the removal of ice and snow from bus stops and clearing of immediate sidewalk area to facilitate access to Transit Buses for sheltered Bus Stop locations and designated Town Maintained sidewalk locations. Ex. Central Business District, etc.

Refer to Appendix K (page 31) for Facility Snow/Ice Treatment Plan

E/F. Personnel designated to supervise/assist with the installation of snow equipment, such as tire chains, snow tires and to conduct the repair and maintenance of required ice/snow removal equipment and/or vehicles.

* The names of the personnel designated to these job responsibility categories along with their home telephone numbers are indicated in Appendix A.

V. Personnel Administrative Procedures

All Division supervisors shall maintain an event daily record of personnel hours worked, what duties they performed, expenses, and what resources were utilized. This includes facility generator hours ran and servicing of the units should there be a loss of power to town facilities. All hours, duties, expenses, and resources committed to the winter weather event shall be recorded and a copy submitted to the Director of Public Works.

Upon execution of the Winter Weather Plan, all Division Supervisors or his delegated representative shall begin a log of the following, but not limited to:

- Weather reports
- Personnel notified to work
- Personnel reporting to work and hours worked included what they did
- Pieces of equipment mobilized
- Quantity of sand/salt utilized
- Quantity of ice melt used at facilities
- Damage to private or Town property
- Vehicle or equipment repairs
- Removal of stranded vehicles interfering with snow removal
- Generator hours ran by each facility generator, if ran. Include any portable units utilized
- Notifying, record keeping and directing contractor resources

The date and time of each entry shall be indicated. A summary of the log's data along with an accounting of snow/ice removal expenditures shall be submitted in "report form" to the Director of Public Works by all Division Supervisors.

Personnel reporting for duty shall report directly to the Shift Supervisor or his delegated representative for their orientation of specific duties for the work shift. Each driver or equipment operator will be issued a clipboard with an Ice/Snow Removal Log attached. Weather conditions and a driver's checklist of maintenance items are recorded on this log. The driver's checklist is updated every two (2-4) hours. The Ice/Snow Removal Log shall be turned in to the Shift Supervisor at the end of the employee's shift. See Appendix C (page 12) for the Ice/Snow Removal Log form.

VI. Equipment to be Utilized

Equipment #	Make/Model	Description	Attachments	Primary Use
501	2007 International	Single axle dump truck Diesel – 33,000 GVR 10 CY	Brine tank – 360 gallons. Monroe V-box – 5.8 CY 10' plow	Apply brine, spread salt/sand and plowing
502	2009 Freightliner	Single axle dump truck Diesel – 38,000 GVR 10 CY	Brine tank – 360 gallons. Monroe V-box – 5.8 CY 10' plow	Apply brine, spread salt/sand and plowing
33	2006 International	Single axle dump truck Diesel – 33,000 GVR 10 CY	Swenson V-box – 5.8 CY 10' plow	Apply salt brine, spread salt/sand and plowing.
31	Chevy 3500 Dump Truck	Single Axle Dump Truck Diesel – 25,200 GVR	Tailgate Spreader 10' plow	Spread salt/sand and plowing
41	2006 Ford F350	Diesel – Ext. Cab 4 x 4	Hiniker V-box 1.5 CY 8' Hiniker plow	Plowing
60	2002 Case 580SM	Diesel – 18,000 lbs. – 94 hp 4 x 4 loader/backhoe		Load salt/sand snow removal
69	2019 Case 580SN	Backhoe		Load salt/sand snow removal
509	JCB Skid Steer	Diesel loader	Broom attachment	Snow removal. Use on impervious surfaces
500	2007 Lee Boy 685B	Diesel – Motor Grader		Plowing
611	2016 Ventrac 4500Y	Diesel - Multi-use tractor	4' plow	Plowing – parking, bike paths, and sidewalks
612	2018 Ventrac 4500Y	Diesel - Multi-use Tractor	4' plow	Snow removal sidewalks and paths
805	2011 Freightliner	Diesel – GVWR 35,000 lbs.		Debris loading and hauling

Salt Brine Application – rate of 40 gals. Per 12’ width lane mile @1300 rpm (20 MPH)

- Units #501 and #502 – dual tank capacity is 360 gals each unit
- Monroe controller - MC-30 – set liquid rate of #9
- Capacity to treat 9 lane miles if continuously applied rather than spot treatment
- Brine applied to Priority Route 1 in Areas 1 and 2 and designated town facilities

Salt and Sand Application Settings – rate of 400 lbs. per lane mile at @1300 rpm (20 MPH)

- Units #501, #502 and #33 – capacity is @ 6 CY each unit
- Units #501 and #502 – Monroe spreader/controller – MC-30 – Set Spreader to #3, set Spinner to # 4 – spreader door opening of 1 1/2”
- Unit #33 – Swenson spreader - dial controller on floor – Set Auger to #3, set Spinner to #4 – spreader door opening setting of 1.5” to 2”

Note: When cleaning or emptying materials from spreader units, the spreader, auger and spinner speeds can be adjusted up to increase rate of emptying out the hoppers. Return all settings to their respective application rate settings when complete with emptying of materials from V-boxes. Refer to V-Box Brine System and Winterizing Checklist (Appendix I) for further instructions.

Spreader chute deflectors – side panels of chute deflectors **must be checked and adjusted** to make sure the salt and sand is being applied properly without wasting materials. Discharge chute deflectors should be set to distribute materials within an 8-10’ width for travel lane applications or width of plow truck.

Definition:

- Lane Mile – 1 mile in length and average lane width of 12’
- Center Line Mile – centerline length of a roadway from its beginning to end

Contractual Services and Equipment

Upon authorization by the Director of Public Works or the Streets Maintenance Supervisor, contractual services may be utilized. Contractual equipment shall include, but is not limited to, one motor grader and one rubber tired loader.

VII. General Policies

The Public Works Department will monitor local weather forecasts during periods of problematic winter weather. The responsibility for obtaining weather reports shall be that of the Shift Supervisors, Public Works Superintendent, and Director of Public Works. Local weather forecasts will be monitored utilizing:

- **U.S. Weather Bureau** – 919-515-8225 – recording of local forecast
- **www.accuweather.com** - local weather website
- **http://www.wral.com/weather/** - local weather website
<http://www.nationalweatherservice-.com/>

NOAA – winter weather forecast definitions:

- **Advisory:** The National Weather Service (NWS) issues a Winter Weather Advisory when it expects conditions to cause significant inconveniences and may be hazardous.

- **Watch:** The NWS issues a Winter Storm Watch when severe winter conditions, such as heavy snow and/or ice, may affect your area but the location and timing are still uncertain. A Winter Storm Watch is issued 12 to 36 hours in advance of a potential severe storm.
- **Warning:** The NWS issues a Winter Storm Warning when 4 or more inches of snow or sleet are expected in the next 12 hours, or 6 or more inches in 24 hours, or ¼ inch or more of ice accumulation is expected.

Anytime prevailing weather conditions or forecasts indicate roads and/or bridges may become hazardous due to ice or snow, Public Works personnel, as designated in Appendix A, will be mobilized when directed by the Director of Public Works.

When hazardous conditions develop during non-working hours, the Orange County Emergency Communications Center (911) or the Police Department will contact the Director of Public Works or the Shift Supervisor who will then notify the appropriate personnel to report to duty. All Standby employees are to contact the Shift Supervisor by telephone or in person should the Standby employee observe winter weather conditions necessitating reporting for duty.

Based on the type and severity of the weather conditions, the Director of Public Works will ensure the following preparations are completed, but not limited to:

- Initiate Salt Brine pre-treatment of designated roadways dependent upon weather forecast.
- Sand/salt spreaders are mounted and prepared for operation.
- Plows and chains are attached to plow trucks and other equipment made ready as deemed necessary
- Fueling to maximum capacity, maintenance and operational inspection of all necessary equipment including radio and cell phone communications.
- Inventory and determine readiness state of essential tools (Ex: chain saws), spare parts, and supplies. Prepare re-supply orders if needed.
- Notification of additional crews to remove trees or fallen limbs and/or to assist with various aspects of the winter weather operations

Anti – Icing – Salt Brine Pretreatment

Based on the type and severity of the weather conditions forecasted, the Director of Public Works will determine the application of salt brine pre-treatment for designated roadways. Salt brine is not applied when the storm is forecasted to start out as a rain event, as the rain will wash the brine off of the roadways. When a determination is made to apply salt brine, it is applied to hills, bridges, overpasses, and emergency service areas within 24-48 hours of the beginning of a storm.

Ice

During moderate icing conditions, two (2) or more trucks will begin sanding or salting of major thoroughfares, intersections, hills, curves, and bridges.

Snow Policies

Snow should be at least two (2”) inches deep and falling and/or additional accumulation forecasted prior to snowplow operations beginning. Major emphasis is placed on arterial/collector streets, hills, and approaches to emergency facilities with secondary priority given to local residential streets. Snow will be removed generally by plowing from the center of the street toward the curb or the extreme edge of the pavement. If snow accumulations become so great as to require hauling, the snow stockpiles will be disposed of at Anderson Community Park and/or at other snow dumping areas so designated by the Director of Public Works.

Sidewalk Snow Removal from Town Designated Sidewalks (sidewalk locations are identified within Appendix E (page 22)).

Sidewalk snow removal will not begin until:

1. All other snow removal operations are fully staffed for 12 hour rotating shifts and in progress.
2. When sufficient personnel and resources are available to begin sidewalk snow removal.

VIII. State Maintained Roads - Ice/Snow Removal Policies

The *North Carolina Department of Transportation (NCDOT)* is responsible for ice and snow removal for the following streets located within the municipal limits of the Town:

Estes Drive Extension	SR 1780
N. Greensboro Street	SR 1972
S. Greensboro Street	SR 1919
Hillsborough Road	SR 1009
Highway 54 Bypass	SR 1010
Homestead Road	SR 1777
Jones Ferry Road	SR 1005
Main Street (54 Business)	SR 1010
Merritt Mill Road	SR 1927
Old Fayetteville Road	SR 1107/1037
Rogers Rd.	SR 1729
Smith Level Road	SR 1919

Because of the critical nature of certain NCDOT maintained streets, Town forces will also make an effort to provide ice and snow removal control measures to these streets. The areas of mutual concern are:

Estes Drive	from North Greensboro Street to the railroad tracks
North Greensboro St.	from Main Street to Hillsborough Road (Bus Route-J)
South Greensboro St.	from Hwy. 54 Bypass to Main Street (Bus Route - J)
Hillsborough Road	from Main Street to Old Fayetteville

Highway 54 Bypass	from Old Fayetteville Road to the Public Works Facility (Bus Route - J)
Homestead Road	from Calvander to Rogers Road – Bridge between Stratford and High School Rd.
Jones Ferry Road	from Old Fayetteville Road to Main Street (Bus Route - J)
Main Street	from Hwy. 54 Bypass to Merritt Mill Road (Bus Route - J)
Merritt Mill Road	from Main Street to Rosemary Street
Old Fayetteville Rd.	from Hillsborough Road to Jones Ferry Road (across to University Lake Rd.) (Bus Route –J)
Smith Level Road	from South Greensboro Street to Rock Haven Road

*** It should be emphasized that although Town forces will make an effort to provide ice and snow removal to these NCDOT roadways, the ultimate responsibility for these operations will remain with the North Carolina Department of Transportation.*

IX. Private Property

Reference Town Code Section 7-6 Snow and Ice Removal – *(BOA Amended November 24, 2015)*

“Every occupant of any building used for commercial purposes, the owner of any building used for multi- family residential purposes (i.e., more than 2 dwelling units) in front of which there is (a) a sidewalk paved with stone, brick, asphalt or cement, or (b) a paved parking area intended for the use of customers, employees or residents, shall clear snow, ice or other similar obstruction from the sidewalk and/or paved parking area at the earliest possible time and as soon as the weather permits.”

Ice and snow removed by the property owner or occupant shall not be pushed, dumped, or put in any way within the right of way of a public street to cause a hazard.

X. Media Releases

Information to the newspapers, social media, radio stations, and/or television stations pertaining to ice/snow removal efforts or rescheduling of Public Works functions such as refuse collection, will come from the Director of Public Works through the Communication Director.

APPENDIX A - PERSONNEL/JOB RESPONSIBILITY LISTING

A. Direct Supervision of the Winter Weather Plan

Direct supervision of the crews responsible for ice and snow removal from the Town streets:

Name, Title	Office Phone Number
Joe Guckavan, Director of Public Works	919-918-7427
Daniel Snipes, Public Works Superintendent	919-918-7432

Team A/Day - Shift Supervisors

Name, Title	Office Phone Number
Dillon Dispennette, Streets Maintenance Supervisor	919-918-7434
Bobby Horton, Landscaping & Grounds Supervisor	919-918-7431

Team B/Night – Shift Supervisors

Name, Title	Office Phone Number
Chris Clark, Solid Waste Supervisor	919-918-7433
Gary Watkins, Central Services Supervisor	919-918-7430

B. Team members or alternates of crews, which operate on 12-hour shifts removing ice and/or snow from Town streets

TEAM A/DAY

Raid Wahib	Ellis Kennedy
Lee Barrett	Clint McCauley
Brian Griffith	Angelo Pucinischi
Tony Legette	

TEAM B/NIGHT

Sherman Bradsher	Larry Johnson
Floyd Alston	Maurice Moore
James Jackson	Vacant Position

** Typical shift schedule for Team A/Day is 7 a.m. to 7 p.m. Typical shift schedule for Team B/Night is 7 p.m. to 7 a.m. The team list and shift schedule is subject to change at the discretion of the Public Works Director, based on expected storm arrival time, expected duration, and/or nature of storm (snow, ice, etc.).*

C. Supervision of the crew(s) responsible for ice and snow removal from:

- sidewalks, steps, and parking lots at the Town Hall/Fire Station #1, Century Center/Police Department, and Fire Station #2 (Homestead Rd.)
- sidewalks, steps and parking lots at the Public Works facility
- Public Parking Lots - S. Greensboro St.; Century Center; 108-106 E. Main St.; Roberson St., Sunset Dr., 303 Weaver St. and 104 Laurel Ave.
- Carrboro Plaza and Jones Ferry Rd. – Park & Ride Lots
- Bus Stops
- Bike Paths and Greenways – Libba Cotten; Frances Shetley and others as available resources will allow
- Town maintained sidewalks – list from BOA – refer to Appendix E

Note: Ice and snow removal from these locations will be primarily conducted during daylight hours.

TEAM C/BUILDINGS & GROUNDS

Greg Carver	Weldon Jenkins
Isaac Farmer	Jonathan Stewart
John Garland	Mike Thompson
Abdul Murphy	David Scott
James Smith	Doris Hartenfels

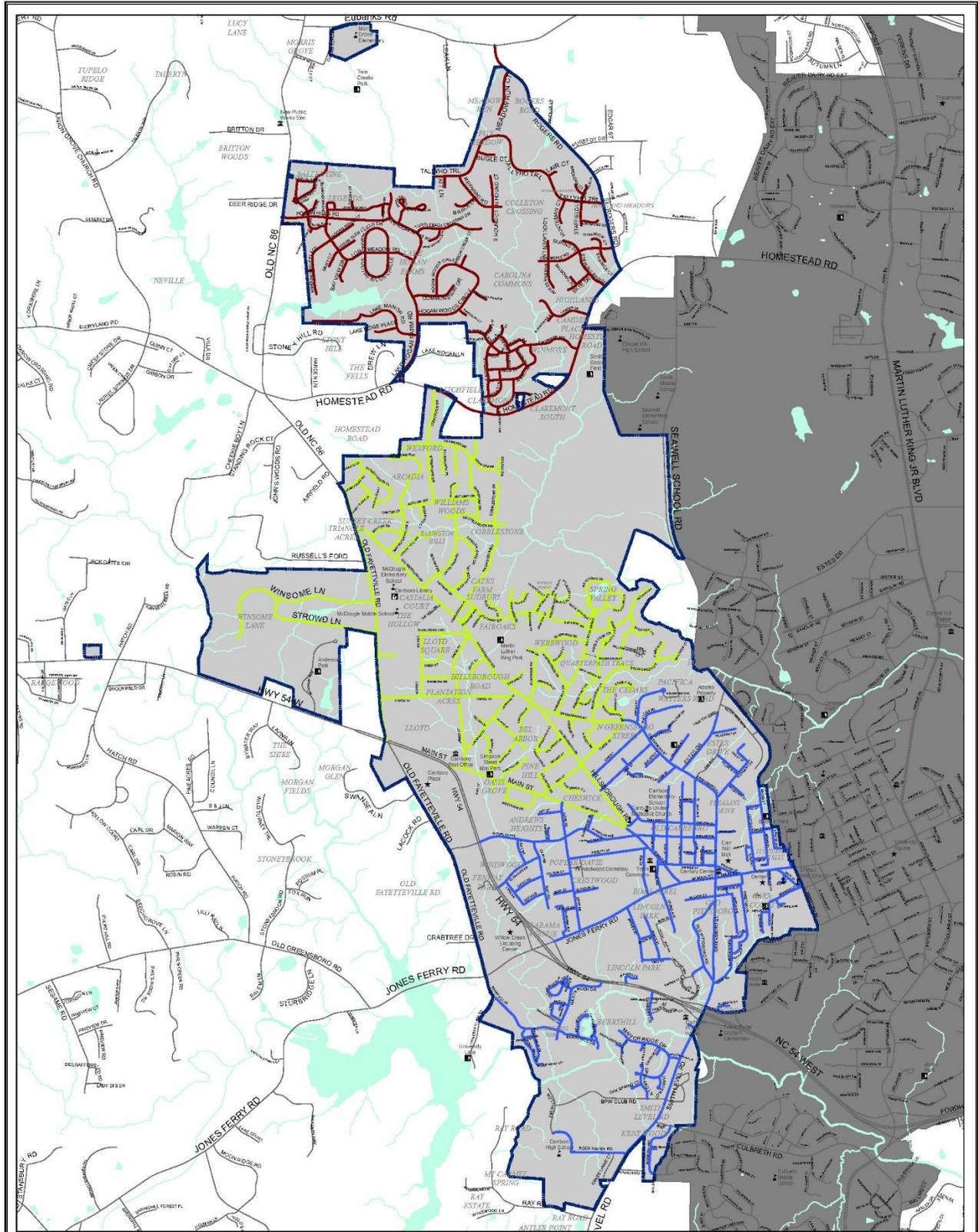
D. Fleet Supervisor and mechanics with:

- Repair and maintenance of ice and snow removal equipment; chain saws, etc.
- Putting on tire chains when deemed necessary

Dustin Cook, Fleet Maintenance Supervisor
Ronald Eddins, Mechanic II
Vacant Position, Mechanic I

E. Public Works Dispatch or Fire Department Emergency Operations Center – When deemed necessary, personnel will be designated by Director of Public Works to serve in these positions.

APPENDIX B - ICE/SNOW REMOVAL ROUTES FROM TOWN STREETS



APPENDIX C - ICE/SNOW REMOVAL LOG

Date	Shift Beginning	Temperature	Accumulation	Weather Conditions
___ month	_____ a.m. _____ p.m.	___ degrees	_____ inches	_____ Snow
___ day				_____ Sleet
___ year				_____ Freezing Rain

Truck/Equipment Number # _____ Mileage/Hours: _____

Comments:

Driver's Check List

Operator/Driver: _____

	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Shovel							
Flashlight							
Safety Vest							
De-Icer/scrapper							
PW Radio Unit							

Truck/Equipment Number: # _____	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Engine Oil							
Radiator							
Brake Fluid							
Windshield Wipers							
Heater/Defroster							
Tires							
Chains							

APPENDIX D – ALPHABETICAL LISTING TOWN MAINTAINED STREETS

<u>STREET NAME</u>	<u>MILEAGE</u>
Abbey Lane	0.13
Aberdeen Court	0.08
Alabama Avenue	0.14
Amber Court	0.10
Arbor Creek Court	0.06
Ashe Street	0.13
Atterbury Street	0.09
Autumn Drive	0.33
Avas Loop	0.04
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B Street (unpaved)	0.05
Balmoral Place	0.04
Barnes Street	0.25
Barington Hills Road	0.26
Bayview	0.11
Beechwood Drive	0.06
Bel Arbor Lane	0.13
Berryhill Drive	0.34
Bert Street (unpaved)	0.09
Bike Alley (unpaved)	0.03
Bim Street	0.21
Blackwood Drive	0.08
Blocker Road	0.03
Blueridge Road	0.48
Bolin Creek Drive	0.48
Bolin Forest Drive	0.30
BPW Club Road	0.61
Brace Lane	0.10
Brendan Ct.	0.06
Brewer Lane	0.15
Broad Street	0.28
Bruton Drive	0.18
Buckeye Lane	0.05
Buck Taylor Trail	0.11
Bugle Ct.	0.07
Burns Place	0.09

Burns Place	0.09
Calumet Court	0.07
Camden Lane	0.27
Canton Court	0.06
Carol Street	0.59
Carr Street	0.21
Cates Farm Road	0.54
Cathy Road	0.14
Center Street	0.07
Cheek Street	0.28
Cheswick Court	0.13
Claymore Road	0.32
Cobb Street	0.06
Cobblestone Drive	0.41
Cobblestone Place	0.05
Colfax Drive	0.06
Colson Street (unpaved)	0.08
Commons Way	0.21
Creekview Circle	0.20
Crest Drive	0.06
Dairy Court	0.08
Dairy Glen Road	0.39
Davie Road	0.59
Della Street	0.18
Deer Street (unpaved)	0.20
Dillard Street (unpaved)	0.15
Dove Street (unpaved)	0.11
Downing Court	0.06
Drayton Court	0.03
East Winmore Avenue	0.44
Ellsworth Place	0.14
Elm Street	0.19
Eugene Street	0.09
Estes Drive Extension (state maintained)	

Fairfield Court	0.04
Farm House Drive	0.20
Fidelity Street	0.37
Fowler Street	0.10
Franklin Street (state maintained)	
Garden Gate Drive	0.14
Gary Road	0.20
Gateridge Place	0.04
Glosson Circle	0.12
Gloucester Court	0.04
Golston Avenue (unpaved)	0.09
Gracewood Place	0.03
Hanford Road	0.13
Hanna Street	0.22
Hargraves Street	0.16
Harvest Court	0.04
High Street	0.23
Hill Street	0.06
Hillcrest Avenue (unpaved)	0.12
Hillsborough Road (state maintained)	
Hillview Street	0.11
Hogan Glenn Ct.	0.08
Hogan Hills Road	0.51
Hogan Ridge Court	0.12
Hogan Woods Circle	0.70
Homestead Road (state maintained)	
Hunter Place (unpaved)	0.05
Huntsman Ct.	0.11
Inverness Way	0.14

James Street	0.64
Jasmine Court	0.06
Jewell Drive	0.16
John Martin Court	0.03
Jones Ferry Road (state maintained)	
Juniper Court	0.04
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Kay Street	0.11
Keith Street	0.11
Kiley Street	0.07
King Street	0.12
Kit Lane	0.05
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Lair Court	0.05
Lake Hogan Farm Road	0.99
Lake Manor Road	0.33
Lake Ridge Place	0.10
Laughing Bird Lane (unpaved)	0.06
Laurel Avenue	0.34
Legends Way	0.30
Lilac Drive	0.12
Lindsay Street	0.37
Lisa Drive	0.29
Lloyd Street	0.30
Loch Laven Lane	0.09
Long Meadows Road	0.73
Lorraine Street	0.36
Lucas Lane	0.20
Lynn Drive	0.14
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Main Street (state maintained)	
West Main Street (state maintained)	
Manor Ridge Court	0.03
Manor Ridge Drive	0.48
Maple Avenue	0.23
Mary Street	0.05
Meadow Run Court	0.21

Melba Circle	0.05
Merritt Street	0.05
Micheal's Way	0.05
Millrock Court	0.03
Milton Drive	0.16
Misty Pines Place	0.04
Morgan Hill Court	0.08
Morningside Drive	0.33
Mulberry Street	0.08
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NC 54 (state maintained)	
NC 54 Bypass (state maintained)	
Neville Drive (unpaved)	0.06
North Camellia Street	0.11
North Fields Circle	0.28
North Greensboro Street (state maintained)	
North Hawick Ct	0.08
North Hound Court	0.15
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Oak Avenue	0.59
Oak Street	0.32
Oak Glen Place	0.02
Oak Spring Court	0.04
Old Cemetery Road (unpaved)	0.04
Old Hillsborough Road (state maintained)	
Old Pittsboro Road	0.43
Oleander Road	0.24
Orchard Lane	0.10
Orchard Lane Court	0.03
Orlando Place	0.08
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Painted Turtle Lane	0.08
Palomar Point	0.03
Parker Street (unpaved)	0.07
Parkview Drive	0.08
Pathway Drive	1.17
Phillips Square	0.07

Phipps Street	0.15
Piano Street	0.05
Pine Street	0.32
Pine Hill Drive	0.17
Pleasant Drive	0.23
Poplar Avenue (East)	0.38
Poplar Avenue (West)	0.87
Prince Street	0.21
Public Works Drive (state maintained)	
Purple Leaf Place	0.15
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Quail Roost Drive	0.21
Queen Street	0.06
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Rainbow Drive	0.15
Rainbow Drive (unpaved)	0.18
Rand Road	0.09
Randolph Court	0.05
Raven Lane	0.06
Red Sunset Place	0.07
Redfoot Run Road	0.08
Reague Meade Lane	0.05
Renee Lynne Court	0.12
Reynard Road	0.23
Richard Dixon Court	0.02
Richland Court	0.04
River Creek Place	0.03
Roberson Street	0.17
Robert Hunt Drive	0.49
Roberts Street (unpaved)	0.08
Rock Haven Road	0.42
Rock Spring Court	0.14
Rockgarden Drive	0.29
Rocky Point Court	0.03
Rogers Rd. (state maintained)	

Roger Cook Circle	0.01
Rosemary Street	0.09
Rossburn Way	0.29
Ruskin Drive	0.10
<hr/>	
S. Fields Circle	0.28
Shadow Ridge Place	0.29
Sharp Street	0.10
Shelton Street	0.50
Short Street	0.05
Simpson Street	0.41
Skye Drive	0.14
South Camellia Street	0.15
South Greensboro Street (state maintained)	
South Hawick Ct.	0.09
South Hound Court	0.07
Spring Valley Road	0.50
Stable Drive	0.21
Staffield Lane	0.18
Starlight Drive	0.13
Sterling Bridge Road	0.21
Stratford Drive	0.52
Strowd Lane (state maintained)	
Sudbury Lane	0.14
Sue Ann Court	0.09
Suffolk Place	0.14
Sunset Creek Circle	0.39
Sunset Drive	0.02
Sunset Ridge Lane	0.07
Sweet Bay Place	0.28
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Tallyho Trail	1.06
Tanglewood Lane	0.06
Tar Hill Drive	0.22
Teagan Court	0.05
Towne Ridge Lane	0.02
Tramore Drive	0.52
Tripp Farm Road	0.17

Tuckers Pond Drive	0.20
Turtleback Crossing	0.31
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Wannamaker Place	0.05
Waterside Drive	0.42
Watters Road (unpaved)	0.22
Waverly Forest Lane	0.10
Weathervane Drive	0.13
Weaver Street	0.37
Webb Road	0.05
Wesley Street	0.04
West Winmore Avenue	0.16
Westbrook Drive	0.22
Westview Drive	0.25
Westwood Cemetery Road	0.69
Whispering Oak Court	0.03
Whitmore Cirlee	0.07
Wild Oak Lane	0.16
William White Court	0.02
Williams Street	0.15
Willow Oak Lane	0.04
Winsome Lane	0.83
Woods Walk Court	0.07
Wrenn Place	0.03
Wyndham Drive	0.38
<hr/>	
Yeargan Place	0.09

	FY 2018
CARRBORO STREETS - PAVED	45.00
CARRBORO STREETS - UNPAVED	1.68
TOTAL MILEAGE	46.68

APPENDIX E – GROUNDS SNOW/ICE PLAN

The following locations will be addressed dependent upon progress with addressing Town maintained street conditions:

Listing of Town Maintained Public Parking Lots

S. Greensboro St. – (mixed unpaved and paved (concrete/asphalt) – corner of Roberson and Greensboro St. 106 -108 E. Main St. – (unpaved lot) - from Nations Bank to ACME lot across from S. Orange Rescue Roberson St. – (unpaved lot) – corner of Roberson and E. Main St.
Sunset Dr. – (unpaved lot) – corner of Sunset and Rosemary St. 304 W. Weaver St. – unpaved lot by Sparrow and Sons Plumbing Laurel Ave. – unpaved lot – 103 Laurel Ave.

Bike Paths & Greenways

Libba Cotton Bikeway (runs from Roberson to Merritt Mill Rd.) Roberson Bike Path (runs from Eugene St. to Purple Leaf Place)
Frances Shetley Bikeway (runs from Shelton/Elm intersection to N. Greensboro/Estes intersection)
PTA Bike Path (runs from Jones Ferry/W. Main St. intersection to W. Carr St.)
Horne Hollow Bike Path (runs from Autumn Dr. to end pavement)
Bolin Creek (runs from East Chapel Hill High School to Homestead Road)

Park and Ride Lots

Jones Ferry – off S. Old Fayetteville Rd. – future W. Berryhill Dr.
Carrboro Plaza – off N. Old Fayetteville Rd. at rear of Carrboro Plaza Shopping Center (south east corner)

Designated Town Maintained Public Sidewalks - approximately 11 miles of sidewalk (NOTE: Sidewalk clearing will be addressed when sufficient personnel and resources are available to begin sidewalk snow removal.)

Priority 1 - **Central Business District** – sidewalks on **both sides** of street unless indicated otherwise
Total 3.12 miles
Main St. (Hillsborough Rd. to Merritt Mill Rd.) – 1.73 mile
W. Rosemary St. (Main to Merritt Mill Rd.) - .14 mile Weaver St. (Main to Main) - .67 mile
Greensboro St. (E. Carr St. to Parker Ave.) - .58 mile

The following town maintained sidewalks will be addressed after completing the Central Business District as personnel and resources permit. Total 6.73 miles

Jones Ferry Rd. (Main St. to Old Fayetteville Rd.) – both sides Main St. (Hillsborough Rd. to NC 54)
Greensboro St. (Parker Ave. to Hillsborough Rd.) – both sides Hillsborough Rd. (Main St. to Old Fayetteville Rd.) – one side Old Fayetteville Rd. (Hillsborough to NC 54)
W. Poplar Ave. (Main to NC 54) – one side - .75 mile
Smith Level Rd. (Rock Haven to Merritt Mill Rd.- including Morgan Creek Bridge – east side of roadway -.75 mile

APPENDIX F - STREETS NOT YET MAINTAINED BY TOWN

Streets on this listing are **NOT** to be treated or plowed unless directed by the Director of Public Works.

Claremont South Ph. 4 & 5 (south side of Homestead Rd. across from Claremont Dr.) –
Private/Not Accepted by Town 2015 (Bellamy Lane; Claremont Dr.; Larkin Lane) as of Nov. 2015 – final surface not applied/manholes & valves are raised.

Hogan Farms Subdivision

Towne Ridge Lane (portion is Private – stop at end maintenance sign) Lake Manor Rd. – (reference private drive off of end of town cul-de-sac).

APPENDIX G - SAFETY PROCEDURES

I. CONDITIONS WHICH WARRANT SCHEDULING THE ACTIVITY

Any time the prevailing weather conditions or forecasts indicate highways and/or bridges may become slippery and/or obstructed by snow and ice, maintenance forces will be mobilized in accordance with prescribed plans and policies.

II. SAFETY PROCEDURES

The purpose of snow and ice removal is to provide for the safe travel of motorists. In doing this, maintenance forces should endeavor to protect themselves as well as the traveling public by following proper safety procedures.

1. All equipment should be checked before, during and after each storm to insure the operational status of lights, brakes, windshield wipers, exhaust systems, tires, chains, steering, and other preventive maintenance items.
2. Operators should resist the urge to “*get the job done in a hurry*”.
3. Operators should obey all traffic laws while performing snow and ice removal duties.
4. Town personnel should provide assistance to stranded motorists when at all possible. Operators should use their best judgment when aiding stranded motorist. The Town maintenance vehicle should be kept clear of the travel way whenever possible while providing assistance. At no time is it permissible to allow persons other than Town personnel to be transported in the Town vehicle. At no time is it permissible to tow, push or to provide mechanical assistance. It is permissible to communicate a request for medical or mechanical assistance by radio to the shift supervisor or base.
5. During extended storm periods, supervisors should take measures to avoid extreme fatigue among operators. When it becomes obvious that storms will continue for long periods of time, steps should be taken to divide maintenance forces into 12-hour shifts for surveillance of the roadways. If necessary, all available personnel resources within the Public Works Department may be utilized by the Director of Public Works.
6. All personnel should wear appropriate personal protection equipment; such as, but not limited to: steel toed work shoes, reflective safety vest, gloves, safety glasses, ear protection, hard hat, etc.
7. Due to the probability of hazardous conditions, all personnel should exercise extreme caution while conducting their work assignments. (Ex. Slips, trips and falls; hazardous driving conditions; inclement weather conditions, etc.)

APPENDIX H - GENERAL OPERATING PROCEDURES

I. APPLICATION OF DE-ICING CHEMICALS

Deicing chemicals can enhance the safe movement of traffic during adverse winter weather. In order that full advantage may be taken of chemical applications, the following actions should be taken:

1. Brine application, spreader trucks and operators should be mobilized prior to the commencement of frozen precipitation. Motor grader and plow operators may be mobilized after precipitation has begun.
2. Bridges should be treated early. Normally, bridges will freeze before the roadway and prompt treatment of bridge decks will avoid many accidents.
3. Early treatments of busy intersections and interchanges will help to keep traffic moving and avoid accidents.
4. Once chemicals have been applied, always allow sufficient time before plowing (See following section "Plowing Snow and Ice")
5. Stay aware of anticipated changes in weather conditions. Operators should be informed as soon as information on "new" weather is received. Often times, materials can be saved if weather conditions are improving or a needed "jump" on additional snow can be gained as the weather is worsening.

CHEMICAL APPLICATION METHODS are:

1. Two-Lane Facility - Spread salt near the center of the roadway.
2. Super-elevated Curves - spread salt on the high side to allow brine to flow across the roadway.
3. Four-Lane Divided Facility (Roof-type Crown) - Spread salt from the center of the road.
4. Four-Lane Divided Facility (Slope from Median) - Spread salt from the left-hand except where super-elevated curves dictate otherwise.
5. Multi-Lane Facilities - Spread salt on the high side and work down the slope by making sufficient passes to cover all travel lanes.
6. Operators should "play the wind" when applying chemicals during strong winds in order to put salt where it will do the most good.

II. PLOWING SNOW AND ICE

Snow occurs when water vapor in an air mass is cooled below freezing. The density of snow varies. Some storms produce “wet” snow, others “dry” snow. Wet or heavy snow seals to the pavement quickly under traffic and, normally, requires chemical treatment before plowing. Dry or powdery snow can usually be plowed away if the plowing operations begin soon enough. Dry snow occurs during very cold weather conditions (below 25F or -4C) and as long as the pavement remains dry, plowing operations can keep the surface of the road clear.

The secret is to know when to plow and once chemicals have been applied, the operator can tell when to plow by watching the passing traffic. As long as the slush is soft and fans out behind the tires of passing vehicles, the salt is working, but when the slush begins to stiffen and is thrown directly to the rear of the tires, it is time to plow and spread more chemicals. Never apply chemicals followed immediately by plowing operations. Salt is of no benefit on the shoulder of the road.

Snow will generally be removed by plowing from the center of the street toward the curb or the extreme edge of the pavement. It is important that plowing patterns conform to the needs and physical characteristics of the individual location. (Ex. When there is on-street parking, it may be necessary to plow snow to one side of the roadway or street.) Pavement obstructions such as railroad tracks, curbs, speed humps, traffic circles, raised button delineators, rumble strips, and the like must be considered when establishing the plowing patterns. The most prevalent problem on Town streets is the lack of adequate area for storing snow. For this reason, specific plowing patterns for each street should be developed and the assigned operators thoroughly indoctrinated in the plowing sequence.

Other considerations and special attention should be given:

1. Drainage of melting snow.
2. Removal of windrows from ramps, entrances, and exits.
3. Loss of plow path width on sharp curves.
4. Sight distance when using intersection areas for snow storage.

III. USE OF ABRASIVES

The most prevalent and effective use of abrasives takes place when the temperature is 20F (-7C) or below and falling. This is due to the fact that direct chemical applications lose most of their effectiveness under these conditions and can sometimes create a hazard by virtue of the fact the weak brine solution created by the limited melting action will refreeze.

The purpose of abrasive application is to provide traction, and is not intended to remove snow and ice. Abrasives are to be applied only to ice and/or packed snow locations to improve vehicle traction.

IV. CLEAN UP AFTER A STORM

Immediately after a snow or ice storm and the pavement is bare, there still remains very much for maintenance forces to do.

1. Drainage structures, such as curb inlets should be cleared of obstructions so that melting snow will not be within a travel lane.
2. Tree limbs and other debris should be removed from the right-of-way as soon as possible.

Immediately after each storm, all equipment (v-boxes, snow plows, plow trucks, backhoes, motor grader, backhoe, etc.) should be inspected and scheduled for repairs as required. These preventative measures should include but not limited to:

1. Inspection of the internal auger/conveyor, spinner assembly, spreader pump, all hydraulic hoses and fittings.
2. Inspection of snow plows, motor grader and backhoe for blade or skid shoe wear, damage, missing pins, damage to hoses or electrical lines that need to be reported and followed up with to insure equipment is ready for the next storm event.
3. Inspection of all lighting systems, wiper blades, tire chains or drop down chains.
4. Inspect operator cab area to insure cab is clean and that first aid kits, safety triangles and fire extinguishers are secured and made ready as needed. Inspect flashlights for battery replacement.
5. Empty remaining sand/salt from V-boxes into Sand/salt storage facility. Thoroughly wash all units including the underbodies of the truck and V-boxes to remove salt and sand from equipment surfaces. Nuetro-wash or equivalent should be used during washing to neutralize salt corrosion of metal surfaces. When units are thoroughly dry, apply the appropriate protective coatings to conveyor/auger.
Note for Hiniker v-box: Do not pressure wash the electric motor at rear. Okay to wash with water. Do not use Lubra-seal coating for the Hiniker V-box as it will bond the conveyor or drive chain/cleats to the floor of the conveyor. Only a light SAE oil should be used to coat the conveyor or drive chain per Hiniker Operator's Manual. Refer to Hiniker manual.
6. Verify hydraulic tanks are filled to the prescribed level. Verify spinner motors have sufficient oil. Apply grease for all grease fitting wear points as shown within the Operator's Manual. Always wipe the grease fitting prior to injecting grease and when complete, wipe away all excess grease from grease fitting.
7. All hydraulic hose ends shall be capped and plugged to prevent debris or damage to hose ends.
8. All electrical line connections shall be capped and plugged to prevent debris or damage to hose ends. Coat the inside of the electrical line connections with dielectric grease prior to capping or plugging.

APPENDIX I - BRINE SYSTEM CLEANING AND WINTERIZING CHECKLIST

This list is based on the assumption that remaining brine has been fully emptied or pumped remaining brine from both V- box tanks into PW storage tanks and Brine application has been completed.

1. Flush out brine system with 200-300 gallons of clean water by cycling the brine application system as if you were spraying brine. Make sure to flush fill lines and pump connections by uncapping the lines and by turning on and off the appropriate valve (one at a time). The valves are located; one on the driver side of the unit to the left of the spinner with the connection pointing straight down labeled valve # 1 (see picture 1 below) and the other line connection is located on the passenger side of the truck to the right of the spinner and runs horizontal labeled valve #2 (see picture 2 below).
2. After the brine system has been thoroughly flushed, proceed with applying Nutra-Wash to the V-box unit following the manufacturers' instructions. Follow with pressure washing the entire truck body and V-Box to thoroughly remove all sand and residue from the truck and V-box unit with special attention given to underneath the dump bed and v-box including the conveyor, spinner head and deflectors to minimize the corrosive properties of salt.
3. After the unit has been thoroughly cleaned and flushed, open the petcock (**DO NOT REMOVE PETCOCK**) located on the bottom of the water pump to the left of the spinner near valve #1 and leave petcock open. Remove all line caps and make sure **all valves** are in the **open position**. Disconnect the feeder hose for the spray bar and drain any residual water. Make sure to secure the feeder hose so it does not drag the ground. Tag out unit until next use by hanging the **LOCK-OUT tag** on the ring at bottom of valve # 1 (see picture 1 below). At this point you are complete. Leave everything open unless otherwise instructed by Fleet Maintenance Supervisor to further winterize the system.

When preparing to apply brine to roadways, complete this checklist in reverse order.

Picture # 1 Valve # 1



Picture # 2 Fill Valve # 2



APPENDIX J - FACILITY SNOW/ICE PLAN

Town Hall and the Fire Dept.

Bare ground solution may be applied as a pretreatment to reduce buildup of snow & ice on concrete or brick surfaces at all listed locations. Pretreatment will make shoveling easier after the storm.

Note: Do not apply if temp is above 35 degrees. (causes slippery surface)

- Use calcium chloride on concrete areas
- Use bag sand on brick steps
- Calcium chloride **SHALL NOT** be used on the permeable surfaces located in Town Commons. These areas are to be treated solely with the broom attachment for the JCB Skid Steer

Treat sidewalks and steps around the town hall and fire dept. This includes the handicap ramp in front of town hall.

Century Center

- Use calcium chloride on concrete areas
- Use bag sand on brick steps.

Treat sidewalks around the building including the parking lot sidewalks along N. Greensboro & Weaver. St.

Note: Police dept. steps have a special coating on them. Use bare ground solution (35 degrees or lower) and bag sand on police dept. steps.

Fire station 2

- Use calcium chloride on sidewalks and in front of garage doors (ten feet out)
- Where accumulation is greater than 1” remove snow/ice accumulation from sidewalk/step surfaces before treatment.
- If snow accumulation is more significant, parking lots at both town hall and century center are to be cleared using the Ventrac V-Blade or Snow EX Broom.
- Watch for parking stops when clearing parking lots.
- When clearing parking lots do not pile snow on the building side of parking lots.
- Push or place snow/ice to the low side of the lots and preferably near a catch basin or curb inlet. Avoid blocking catch basins.

Only as requested or directed by the shift supervisor – assistance may be needed with cleaning of bus shelters.

Supplies are located inside the L&G fertilizer shed

- Bare ground solution and sprayer.
- Calcium Chloride
- Bag Sand
- Snow and scoop shovels
- Applicator cups

Note: application rate will be listed on the bag or bucket for Bare Ground and Calcium Chloride.

PPE - Latex or water resistant gloves and safety glasses. Latex gloves can be worn under your work gloves to provide a water barrier.