City of Delaware
Department of Public Works
2018-2019

Access Delaware
Let's get there together

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Introduction

The City of Delaware is responsible for maintaining 169.4 center lane miles of pavement during winter storm events. Policies regarding snow and ice management have been developed to assure acceptable service levels remain sustainable for the highway and street network as well as multi-use trails and public parking lots. For an average winter, the City will use approximately 3,000 tons of road salt for winter operations and over 180,000 gallons of pre-treatment brine.

Central Ohio averages 27 inches of annual snowfall from November through April. The timing of snow plowing during any particular event remains a function of the total accumulation and rate of fall. For snowfalls of less than three inches, the priority (1) and (2) roads can be maintained passable through a combination of pre-treatment applications, salting application and plowing. Plowing will not typically occur on priority (3) i.e. residential roads during light snow events as snow accumulations are generally compacted tight against the pavement from traffic by the time plow operators are finished working on the higher priority streets. Local streets will be managed with pre-treatment and/or salting applications for snow events with accumulations under 3-inches. For storms yielding more than 3-inches of snowfall, residential streets will be plowed, however not until all higher priority streets are cleared and open.

Following a snow event, streets are plowed in accordance with an assigned prioritization that begins with the highest-travelled/highest-speed arterial streets identified as priority (1) routes, followed by moderately-travelled collector streets identified as priority (2) routes, and ending with the lowest-travelled local streets, generally restricted to subdivision side streets, loops streets and cul-de-sacs being priority (3) streets. Public alleys are not included in the plowing program, though at times may be addressed to facilitate public refuse collection. Plows will generally remain on higher-order streets until snowfall ends allowing for completed edge-to-edge pavement clearing. Adhering to this prioritization is essential in maintaining emergency service access routes throughout the community. The City also prioritizes certain locations known as “hot spots” where steep grades, sharp turns or other conditions make travelling more treacherous during a snow storm. These locations are also treated with the priority (1) routes.

Traffic signals at various locations are set in “flash mode” at the discretion of the Public Works Department and/or city safety forces to reduce vehicle collision risk on steep grades under icy conditions. Flash mode is minimized as pedestrians are not provided a protected crossing phase while operating. Intersections subject to flash mode include William St. at Elizabeth St.; Central Ave. at Elizabeth St.; Sandusky St. at Spring St.; and Sandusky St. at the OWU Jaywalk.

In residential subdivisions, plow operators will attempt to clear streets curb–to-curb, which generally requires making two clearing passes in each direction. Cars parked within the roadway limit the ability to effectively clear streets to the curb line. Plow operators do not return to areas to check if parked cars have been moved. During this operation, snow is windrowed across driveways and sidewalk ramps, which at times leads to property owner frustration over having to re-shovel the area. Removing snow edge-to-edge improves roadway safety, while maintaining mailbox access, refuse collection, and drainage to curb inlets and storm drains.

Government Coordination

The City's Street Division Superintendent is responsible for administering all aspects of the snow and ice management program operations including coordination among multiple jurisdictions. The superintendent organizes an annual pre-season meeting with other local jurisdictions and agencies to review policy, and discuss potential service-level coverage and route coordination changes. Decisions made at the meeting are journalized in agreements between the agencies. Agencies included in the meeting are:

City Public Works, Police, Fire, City Manager and Parks Departments
Ohio Department of Transportation District Six Maintenance Garage
Delaware County Engineer's Office
Concord, Delaware, Liberty and Troy Townships
Delaware City, Olentangy Local, Delaware Christian and St. Mary Schools
Delaware County Sherriff and Delaware Emergency Management Agency

Snow Emergency - Level 1, 2 and 3 Events

In accordance with Ohio law, the City of Delaware recognizes the following snow emergency classifications as declared by the Delaware County Sheriff:

- **Level 1** – Advisory - Conditions are hazardous; Motorists should drive carefully.
- **Level 2** – Cautionary - People should only drive if absolutely necessary.
- **Level 3** – Emergency - Roads are closed to non-emergency travel. Violators may be ticketed.

During Level 2 & 3 snow emergencies, the City coordinates Public Works and emergency response activities in accordance with the City's Emergency Management Operations Plan via daily meetings and remote teleconferencing. The Public Works office is open until 10 p.m. during Level 2 snow emergencies, and remains open continuously during Level 3 snow emergencies to receive public inquires and emergency calls to the Public Works Department at 740-203-1810.

Treatment Options

A variety of snow and ice management materials and techniques are available. Air temperature, pavement temperature, precipitation type and rate, all play a critical role in determining the best application of snow and ice management materials. Road salt is the primary material utilized by the City in de-icing roadway surfaces and is used to suppress the freezing point of water, thus allowing accumulated snow and ice to turn back to a liquid state and flow off the road surface. Road salt is typically spread on a roadway surface directly over accumulated snow to aid melting. A pre-wetting salt brine solution is applied to the road salt as it is spread from the distributor to expedite the salts melting ability. Plowing becomes more effective once salt becomes active, breaking up snow pack on pavement.

Pretreating pavement with salt brine reduces snow and ice bond to pavement, allowing for more effective clearing as plows pass through. After application, the water evaporates leaving behind a coating of salt that stays in place directly on the pavement for up to several days in advance of a storm. In contrast, 75% of road salt, when applied directly to the pavement surface, will be scattered to the pavement edge by bouncing and exposure to traffic, thus reducing efficacy of the application. Both road salt and salt brine becomes less effective in temperatures below 25 degrees. Agricultural additives are added to both salt and brine solutions to improve effectiveness of each material at lower temperatures. The city utilizes salt brine solution to pretreat pavement surfaces in temperatures above 25 degrees. A 70/30 ratio of salt-brine to additives is used to expand the working pretreatment range down to 10 degrees.

Pretreating operations will occur for all Priority (1) and (2) streets in advance of a storm. Priority (3) streets may be pretreated to aid in snow removal when temperatures are anticipated to remain below freezing for an extended period of time following a snowfall, or if snow accumulations are anticipated to exceed 3-inches. The benefits of applying anti-icing and deicing materials must be carefully monitored against both the rising expense and associated environmental impacts. Research demonstrates that the chloride levels of local and regional streams and rivers increase during the winter months in direct association with salt runoff, impacting the biology of the river systems. The newer additives are being formulated to reduce the corrosive nature of salt and to reduce the overall quantity of material needed to manage snow and ice on the roadways.

Snow Removal – Route Prioritization

Plowing occurs when the snow cover must be removed to establish safe passage for vehicles. The City plows all Priority (1) and (2) streets to bare pavement for all storms. Priority (3) streets are generally not plowed unless the snow depth exceeds 3 inches. The City places emphasis on roadways that carry the highest volume of traffic at higher speeds. The City has five primary snow management routes serviced by one or two dedicated plow trucks each, depending on the severity of a particular snow event. To maximize plowing efficiency, windrows may be temporarily developed through cross street intersections. Once the mainline pavement is cleared, the plows can return to intersections and remove the windrowed snow. This practice allows plows to efficiently clear the maximum miles of main line street in the least amount of time. A map delineating the Priority (1) & (2) snow routes are included at the end of this document.

Priority (1) roads are the most critical for emergency vehicle routing, daily commuter traffic, industrial and business transport, and for school busing. These main routes carry up to 85% of all traffic miles travelled in a day, and typically at higher speeds than residential streets. In addition, Priority (1) locations include specific "hotspots" that become dangerous in icy conditions such as steep hills, dangerous curves, rail crossings, and intersections prone to heavy traffic volumes, congestion or pedestrian activity. During an active winter event, Priority (1) roads will be maintained in passable condition at all times and will be cleared curb-to-curb within 12 hours after the accumulation of snow ends.

Priority (2) locations include designated major and minor collector roadways within the City that serve schools, business centers and residential areas. All Priority (2) roadways will be cleared curb-to-curb, within 12 hours following completion of the Priority (1) roads, providing the majority of residents with a clear and safe path of travel within ¼ to ½ mile of their residence.

Priority (3) roadways generally include all remaining neighborhood streets and cul-de-sacs. Priorities (3) streets are cleared in five routes beginning with the current day's refuse collection route and continuing through subsequent routes until all streets have been addressed. All residential roadways will be cleared curb-to-curb within 48 hours after the accumulation of snow ends. Four-wheel drive pick-up trucks equipped with plows are assigned to clear cul-de-sacs as they are more maneuverable within the bulb area and can complete the work more efficiently than the larger dump trucks. In some cases a cul-de-sac may be cleared in advance of other neighborhood thru-streets.

Downtown Business District
Snow removal in the Downtown Business District is impacted by motorist, pedestrian traffic, and high volume of on street parking along the curb. Snow is plowed to the center lane of Sandusky Street (between Court Street and Bernard Avenue), center lane of Winter Street (between Henry Street and Franklin Street), and center lane of William Street (between Henry Street and Washington Street). This practice minimizes parking restrictions and allows for business access to be maintained.

Generally, the removal of snow from the center lanes is initiated approximately 48 hours after a major snowfall, and following the clearing of all Priority (1), (2) and (3) streets. The delay provides ample opportunity for business and property owners to remove snow from the walks to the street curb line where it can be plowed to the center during overnight hours. Snow removal is performed during early morning hours to avoid conflicts with traffic and parked cars, and typically following posted parking restrictions. The City Manager has the authority to issue a "No Parking" ban within specified areas to help facilitate downtown snow removal operations. Snow removed from downtown is stockpiled at the County fairgrounds.

Delaware Municipal Airport
The airport is considered a high priority due to accident potential; however pilots generally do not expect the runway to remain clear at an uncontrolled airport during a winter storm. The Airport Operations Supervisor is responsible for initiating snow clearing. The Airport has two single-axle dump trucks and a power broom/blower for snow clearing operations manned by airport personnel. Additional vehicles are equipped with plows and available at the facility to remove snow accumulation from T-hangar areas. Assistance from Public Works personnel is available on an as-needed basis, but only after all public roadways are cleared. The airport runway, taxiway, and the apron will be cleared first followed by paved areas between aircraft hangers.

If ice along the runway develops, airport personnel will issue a "Notice to Airmen" (NOTAM) indicating this condition. A NOTAM is issued upon staffs arrival to the airfield if, in the opinion of the person authorized to conduct inspections, runway snow accumulation could present a danger to aircraft through diminished braking action. A NOTAM will also be issued prior to airport runway snow clearing or maintenance activity which requires the presence of snow removal equipment on the runway or taxiway at any time. Non-corrosive ice control applications may be applied if available. Under no circumstance can a corrosive material like road salt, calcium chloride or potassium chloride be utilized at the airport property for snow and ice control. A heated stockpile of fine aggregate sand is maintained to improve runway traction as needed.

Fire Stations 301, 302, 303 and 304
Fire Department personnel are responsible for clearing parking and apron areas in front of the apparatus bays, pedestrian walks and parking areas at all stations. The department has access to a 4-wheel drive trucks outfitted with a snow plow to aid in snow removal.

Public Parking Lots
The City has fifteen properties with public parking lots. The Parks & Natural Resources Department is responsible for snow clearing operations of all City lots. Some lots can be cleared by plowing snow to the edge where adequate room exists to stockpile snow. Other lots require stockpiles to be removed so that parking spaces are not lost. Clearing parking lots generally begins at 3 a.m. so that public access is available by the time City buildings open. Generally all public parking lots can be cleared in one 8-hour shift.

The following parking lots are listed in order of priority.

1. Justice Center
2. Delaware Community Center YMCA and Field Parking Lot
3. City Hall
4. East William Street Lot (Former Engineering Building)
5. East William Street Parking Lot (Eat of BP Station)
6. North Franklin Street Public Lot
7. East Winter Street Public Lot
8. Mingo Park Facility
9. Smith Park Facility
10. Blue Limestone Park
11. Hidden Valley Golf Course
12. Ross Street Park
13. Oak Grove Cemetery
14. Bennett Park
15. Mill Run Dog Park

Sidewalks and Multi-Use Trails
The Parks & Natural Resources Department is responsible for clearing specified segments of public sidewalk and multi-use trails. While the goal is to have all sidewalks and trails cleared within 48 hours following the end of snow accumulation, the ability to complete the work is subject to the availability of personnel and equipment. Sidewalks addressed by the city include:

- Sidewalks abutting city owned buildings
- Sidewalks abutting city controlled public parking lots
- Sidewalks on public highway bridges
- Sidewalks abutting city parks

Only heavily used sections of multi-use trails within the public right of way will be cleared of snow. Trails in remote areas of the community, or in areas where there will be little anticipated use, and that have alternate walking routes available will not be cleared. Not all trails are treated with salt following clearing of snow.

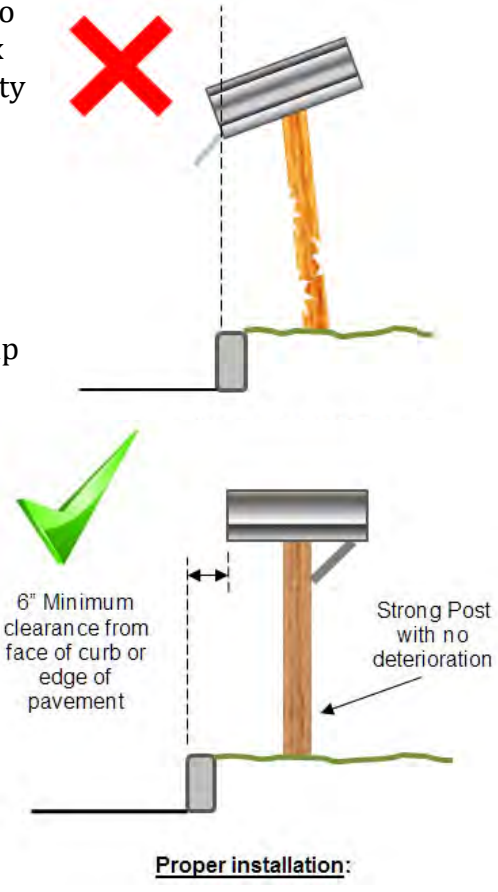
Staffing and Equipment

Highway operations are principally managed by the Public Works Department with additional support from other departments on an as-needed basis. During a winter storm event, crews will work 12-hour day and night shifts. All single or tandem axle plow truck drivers are required to possess a Class B Commercial Driver's License, and is trained in the safe operation of large plow and salt spreader equipment. Staff assigned to operate the brine application equipment must also be certified with a tanker endorsement. Non-CDL drivers are permitted to operate the ¾-ton pickups outfitted with plows.

The Public Works Department maintains (8) single axle and (2) tandem axle dump trucks as the "front line" snow removal equipment. Each is equipped with a 10' plow blade and salt application spreader. The single-axle trucks carry up to 8 tons of salt while the tandem axles are outfitted with V-Body salt spreaders are capable of carrying up to 12-tons of material. Also available for service are a number of ¾- and 1-ton pickup trucks with plows, skid steers, backhoes, and a front-end loader to assist in particularly heavy accumulations. The city utilizes two 1,600-gallon anti-icing brine applicators installed on single axle dump trucks for roadway pre-treatment operations. The salt storage barn has capacity to store up to 3,500 tons of road salt. The City also has the capability to produce salt brine at the Public Works facility, with a production capacity of 1,500 to 1,800 gallons per hour, and 42,000 gallons of onsite storage.

Mailbox Damage and Ice Dams

During the course of plowing activities, mailbox damage can occur. In some cases the weight of snow pushed off the plow blade can cause a weak mailbox post to break. In other cases, the mailbox itself may be struck by the plow blade if the mailbox extends beyond the face of the curb or edge of pavement. The City encourages property owners to inspect their mailboxes annually to be sure the posts are in good condition and that the face of the mailbox is at least 6-inches behind the face of curb or edge of pavement. The city is not liable for making repairs if from assessment, the mailbox is mailbox is found to have a weak or rotted post, or that it was improperly positioned.



Proper installation:

Another common occurrence found along the edge of pavement is the formation of ice dams generally located at the outlet of a sump pump drain lines through the curb. Ice dams form when an active sump pump discharges water directly onto cold pavement that quickly freezes on contact, forming an icy spot. There is little the City can do to prevent this from occurring. Property owners are encouraged to clear the ice away from the face of the sump outlet to prevent ice from continuously building up into the discharge pipe and ultimately blocking the sump drain line. Rock salt can be applied liberally near the outlet to prevent water from directly freezing at the location to help keep the outlet clear. In cases where ice dams extend well into the travel lanes of a street, the City may dispatch a truck to apply salt over the icy area to help melt the accumulated ice. During extended cold periods with temperatures well below freezing, property owners may consider temporarily disconnecting the sump outlet from the curb drain line where it exits the house and reconfiguring the outlet line so that it discharges directly to a splash block or extension away from the foundation.

Public Responsibility
Property owners and motorists alike have a responsibility to do their part in maintaining safety during the winter season and are encouraged to follow these practices. This information is posted on the City website as well as on social media outlets available to the city.

- ✓ Adhere to the Snow Emergency Level driving restrictions as initiated by the Sherriff's office.
- ✓ Keep a safe distance when driving near snowplows and brine application vehicles.
- ✓ Never pull up directly behind a plow truck in the driver's blind spot.
- ✓ Do not pass a snowplow on either side when it is actively plowing snow.
- ✓ Keep children away from streets while plows are clearing snow.
- ✓ Remind children to not play in snow piled within or adjacent to roadways.
- ✓ Move parked cars off the street to allow plow drivers to clear snow from curb to curb.
- ✓ Drive at half the posted speed limit and give yourself twice the stopping distance on snow.
- ✓ Use winter snow tires to improve traction.
- ✓ Pile snow to the left of the driveway as you face your home looking from the street.
- ✓ Do not clear snow from driveways or sidewalks into the roadway.
- ✓ Clear snow from around fire hydrants, storm drains and sump outlets.
- ✓ Keep sidewalks and handicap ramps clear and free of snow and ice.
- ✓ Assist elderly or disabled neighbors with snow removal.
- ✓ Maintain mailboxes in good condition with the face of the box at least 6-inches behind the curb or edge of pavement to avoid being struck by a plow.
- ✓ Keep pets from walking through puddled water when temperatures are below freezing as briny (salty) water can be below the freezing point, causing frostbite to animal's feet.

2019 Snow and Ice Management Route Priority Map