

2018 - 2019

City of Columbus Snow and Ice Control Plan



THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

DEPARTMENT OF PUBLIC SERVICE
INFRASTRUCTURE MANAGEMENT

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Table of Contents

<u>Section</u>	<u>Page</u>
I. General Information	
Introduction	2
Objective	2
General Practice	2
Roadways Defined	2
Roadway Service Prioritization	3
Sequence of Service	3
Routing	4
II. Operational Information	
Levels of Service	5
Snow and Ice Control in Central Business District	8
Staffing	9
Materials	9
Equipment	9
Auxiliary Routes and Locations	10
III. Service Delivery Information	
In Event Performance Indicators and Goals	11
Bike lanes, Sidewalks, Alleys and Parking Lots	11
Post Service Expectation	13
IV. Seasonal Information	
Winter Season Preparation	14
Emergency	14
Snow Level Emergency	15
Communication/Service Requests	15
Warrior Watch	15

Introduction

Due to its geographic location, Columbus, Ohio is subject to freezing rain, snow and ice at any time during the fall, winter and spring months. Winter events typically occur from October through April. During winter weather events, the Department of Public Service is responsible for the *mobility and safety* of the traveling public.

Objective

The objective of the City of Columbus snow and ice control program is to allocate trained personnel, proper equipment, and adequate materials to provide a *Passable Roadways* objective that allows for safe travel on our main and secondary arterial roadways. Based on actual winter conditions this objective aims to provide a passable, safe driving surface, with a reasonable amount of inconvenience during an event. A passable roadway objective should not be mistaken for an “Always Bare Pavement” objective.

General Practice

The goal is to minimize adverse road conditions by utilizing available resources and maximum effort from all personnel, thereby reducing interruptions to livelihood and limit unfavorable impacts to the overall quality of life. The City of Columbus oversees snow and ice control activities on over 5,600 lane miles of roadway which includes the Freeway System, Principal Arterials, Major/Minor Collectors, and Local Residentials. The Division of Infrastructure Management reviews and revises its snow and ice control plan annually as an ongoing effort to further improve the service provided to the citizens of Columbus.

Roadways Defined

For snow and ice control, the City of Columbus classifies its roadways mostly based on the Highway Functional Classification Concepts Criteria provided by the Federal Highway Administration.

Freeway System/ Principal Arterial Roadways

The City of Columbus is responsible for several non-interstate freeways, including portions of State Routes 315, 104 and 161 as well as U.S. 33. Principal Arterial Roadways provide a high degree of mobility by way of servicing major activity centers, carry higher traffic volumes, interconnect and provide continuity for major corridors throughout the city. These roadways also serve intra-area travel for the central business district and the outlying residential areas.

Major/Minor Collector Residential Roadways

Collector Roadways function within the network by funneling traffic from the local residential roadways to the arterial network. Collector Roadways are typically longer, have higher speed limits, have higher traffic volumes, and include more signalized intersections.

Local (Residential) Roadways

Remaining roads are classified as Local and/or Residential Roadways with the intention to provide access to the abutting property, carry little to no through movement, and have lower traffic volumes.

Roadway Service Prioritization

Priority 1 Roadways (yellow)

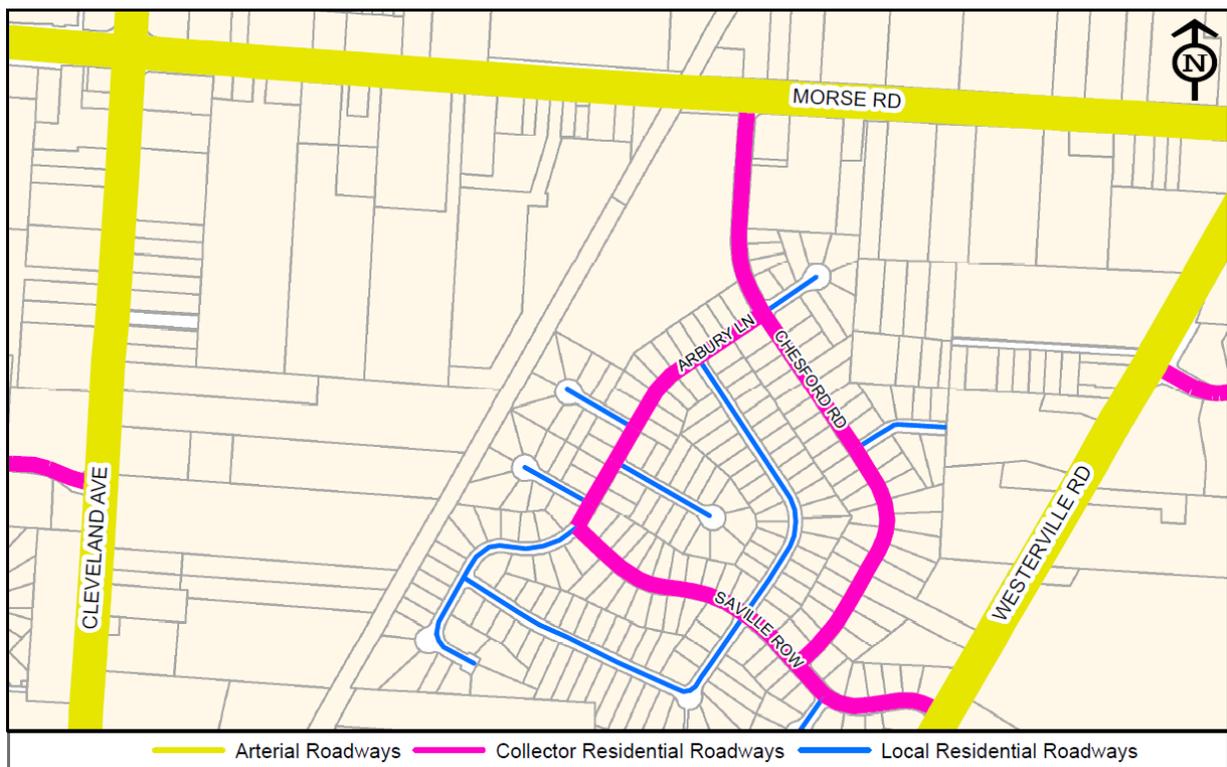
- Consists mainly of Freeway System and Principal Arterial Roadways.

Priority 2 Roadways (pink)

- Consists mainly of Major/Minor Collector Residential Roadways

Priority 3 Roadways (blue)

- Consists mainly of Local (residential) Roadways



Sequence of Service

To provide service in an efficient, systematic manner, the City of Columbus prioritizes service delivery based on roadway type and function. The Department of Public Service may choose to alter its strategy based on weather and roadway conditions.

Freeway Systems and Principal Arterials Roadways (Priority 1) are prioritized initially and receive continued service throughout an event as necessary. Major/Minor collector roadways (Priority 2) receive service after Freeway Systems and Principal Arterials are considered to be in good condition. Designated Local roadways (Priority 3) are assessed and receive service as deemed necessary.

**When servicing roadways of a focused priority (e.g., Priority 1), it is not uncommon for drivers to treat sections of lower priority roadways (e.g., Priority 2) that they pass over in reaching their next section of focused priority. Lower priority roadway sections may also be serviced when a snow plow travels across them as they travel back to an outpost for resupply, or refueling.*

Routing

Priority 1 Routes consist of approximately 1,500 lane miles of roadway and are divided into 109 routes.

** Due to the amount of traffic, travel speeds, and overall composition the Division of Infrastructure Management has identified **Lead Routes** which identify routes and roadways that are serviced at the onset of an event, maintained throughout an event at high priority, and are the focus in case of an emergency. There are 32 of the 109 Priority 1 routes that have been identified as lead routes and are dispatched immediately. For example:*

- Routes that service highways such as SR's 315, 104, 161 and U.S. 33 are considered to be lead routes.
- Routes that service Priority 1 roadways such as Morse Rd., N. High St, Sawmill Rd., and Livingston Ave. are regarded as lead routes.

Priority 2 Routes consist of approximately 900 lane miles of roadway and are divided into 68 routes.

Priority 3 Routes consist of approximately 2,200 lane miles of roadway and are divided into 122 routes.

**The city of Columbus has agreements with multiple municipal agencies in which snow & ice control services are rendered/received. These agreements are enacted to allow for the most efficient process possible. Roadways within agreements are evaluated annually to ensure proper strategies are being implemented.*

Levels of service

The level/type of service each roadway type receives varies based on classification, conditions, equipment, current and future weather. Below are general approaches to snow and ice control that should only be used as a guide for informational purposes. Each winter event is different and results in various techniques being required and utilized.

Pavement Temperature Range and Trend	LIGHT SNOWFALL 2 inches or more per hour			Comments
	Pavement Surface at Time of Initial Operation	Maintenance Action	Recommended Snow Removal Equipment	
Above 32°F	Dry, wet, slush, or light snow cover	Monitor road and weather conditions for drops in temperatures	Anti-icing system or plow truck with a wetting system	Service as needed.
Above 32°F With Temperatures Falling	Dry	Apply liquid	Anti-icing system	Service Anti-Ice Routes (Bridges, Curves, Inclines).
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Service as needed.
25°F to 32°F	Dry	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Service Anti-Ice Routes (Bridges, Curves, Inclines).
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Service as needed.
Below 20°F to 25°F	Dry	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Service as needed.
Below 15°F to 20°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
	Wet, slush or light snow covered	Apply solid materials	Plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F. If sufficient moisture is present solid chemical can be applied
Below 15°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	Do not apply chemicals and maintain dry pavement during windy conditions
	Wet, slush or light snow covered	Plow as needed- apply pre-wetted solid material	Plow truck with salt spreader & wetting system	Service as needed.

Levels of Service (continued)

Pavement Temperature Range and Trend	HEAVY SNOW FALL 2 inches or more per hour			Comments
	Pavement Surface at Time of Initial Operation	Maintenance Action	Recommended Snow Removal Equipment	
Above 32°F	Dry, wet, slush, or light snow cover	Monitor road and weather conditions for drops in temperatures	Anti-icing system or plow truck with a wetting system	Service as needed.
Above 32°F With Temperatures Falling	Dry	Apply liquid	Anti-icing system	Do not apply liquid to heavy or packed snow.
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Do not apply liquid to heavy or packed snow.
25°F to 32°F	Dry	Apply liquid	Anti-icing system	Do not apply liquid to heavy or packed snow.
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Do not apply liquid to heavy or packed snow.
Below 20°F to 25°F	Dry	Apply liquid	Anti-icing system	The appropriate de-icing liquid may be used in temperatures below 25°F.
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing System or plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
Below 15°F to 20°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	Do not apply chemicals and maintain dry pavement during windy conditions. If sufficient moisture is present solid chemical can be applied.
	Wet, slush or light snow covered	Apply solid materials	Plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
Below 15°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	Do not apply chemicals and maintain dry pavement during windy conditions.
	Wet, slush or light snow covered	Plow as needed - apply pre-wetted solid material	Plow truck with salt spreader & wetting system	Service as needed.

Levels of Service (continued)

Pavement Temperature Range and Trend	FREEZING RAIN			Comments
	Pavement Surface at Time of Initial Operation	Maintenance Action	Recommended Snow Removal Equipment	
Above 32°	Dry, wet, slush, or light snow cover	Monitor road and weather conditions for drops in temperatures	Anti-icing system or plow truck with a wetting system	Service as needed. Service icy spots @ 200 lbs/mile or 20 gal/mile.
Above 32°F With Temperatures Falling	Dry	Apply liquid	Anti-icing system	Service Anti-Ice Routes (Bridges, Curves, Inclines).
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	Heavy rain changing to freezing rain will wash chemicals from roads, load and pre-position trucks on routes to begin Service as soon as practical.
25°F to 32°F	Dry	Apply liquid	Anti-icing system	N/A
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	N/A
Below 20°F to 25°F	Dry	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	N/A
	Wet, slush or light snow covered	Apply liquid or pre-wetted solid	Anti-icing system or plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
Below 15° F to 20°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	Do not apply chemicals and maintain dry pavement during windy conditions.
	Wet, slush or light snow covered	Apply solid materials	Plow truck with salt spreader & wetting system	The appropriate de-icing liquid may be used in temperatures below 25°F.
Below 15°F	Dry	Monitor conditions	Plow truck with salt spreader & wetting system	Do not apply chemicals and maintain dry pavement during windy conditions.
	Wet, slush or light snow covered	Plow as needed	Plow truck with salt spreader & wetting system	As snow continues to fall plow accumulation.

Snow and Ice Control on Brick Streets

Neighborhoods with brick streets are serviced and treated in the following manner:

- The first response to brick streets is to provide an application of de-icer material. Additional service will be applied as necessary.
- Snow will be plowed using a combination of vehicles that include pickup trucks, mid-size dump trucks with rubber blades and tractors when snow coverage is significant.

German Village, Victorian Village, Italian Village, Harrison West, Franklinton and Olde Towne East are typical neighborhoods with brick streets.

Staffing

Throughout the designated winter season from late November throughout March, the Street Maintenance staff members are assigned winter shifts to maintain flexible staffing based on the weather conditions and forecasts 24 hours a day, seven days a week. Based on the anticipated arrival time of a storm or event, additional personnel is added to each shift to bring the number of employees to appropriate levels for adequate event management. Shifts are extended to twelve hours when events warrant, or forecasts dictate the necessity. For critical, short-term events, shifts may be temporarily extended to sixteen hours to maintain maximum plowing and service levels.

Materials

The type of material used for the melting of snow or ice depends on the current conditions, predicted weather, and possibly the roadway type (pavement, grade, etc.) being treated. Salt, liquid calcium chloride and sand (for traction) are available at all street maintenance operation facilities for the initial clearing of public roadways. Salt is most effective when applied during temperatures above 15 degrees.

Salt brine is manufactured and used throughout the city and is most effective when used before the snow or ice falls. When temperatures at the time of application are above 15 degrees, brine helps coat the roads and make them less susceptible to ice bonding to the pavement.

The City of Columbus has adopted the practice of prewetting salt with liquid calcium, brine or beet juice. Prewetting the salt provides the moisture needed to start brine formation and the melting process. Prewetting also reduces bounce and scatter, leaving more salt on the road surface where applied.

Equipment

Front Line Snow Fleet

- Tandem Axle Dump Trucks are used primarily for servicing the Freeway Systems and Principal Arterial Roadways (Priority 1), as well as, the Collector Roadways (Priority 2). The Tandem Axle Dump Trucks are equipped with snow plows and salt spreaders with a wetting system.
- Single Axle Dump Trucks are used for servicing the Freeway Systems and Principal Arterial Roadways (Priority 1), the Collector Roadways (Priority 2), and Designated Local Roadways (Priority 3). The Single Axle Dump Trucks are equipped with snow plows and salt spreaders with a wetting system.
- F550 Dump Trucks are used for servicing the Collector Roadways (Priority 2), Designated Local Roadways (Priority 3), and bike lanes. The F550 Dump Trucks are equipped with snow plows and salt spreaders with a wetting system.

Anti-Icing Inserts are plastic containers which hold approximately 650 gallons of liquid which is applied to the roadway with nozzles hanging very close to the driving surface to prevent ice from forming a bond to the pavement. These units can also be used for De-icing, by applying liquid to the road surface after ice bonding has occurred. The size of the vehicle dictates the number of containers that may be used ranging up to approximately 1,950 gallons on a tandem axle dump truck.

Supplemental Equipment Used for Snow and Ice Control as Needed

- F350 Pickup Trucks can be used for servicing Designated Local Roadways (Priority 3) and bike lanes. The F350 Pickup Trucks are equipped with snow plows and salt boxes with a spreader.
- Farm tractors can be used for servicing Designated Local Roadways (Priority 3) and bike lanes. The farm tractors are equipped with snow plows.
- Front End Loaders can be used for loading snow out of areas, as well as, cleaning up ice cuts.
- Road Graders can be used for ice cutting and plowing snow when needed.
- Belt Loaders can be used for loading dump trucks with snow out of the central core area.
- Skid Loaders can be used for Designated Local Roadway (Priority 3) clean up when needed, as well as, sidewalks. The Skid Loaders have a bucket, snow plow, and snow blower attachments that can be utilized for snow clean up.

Auxiliary Routes and Locations

Anti-Ice Routes

Anti-Ice Routes consist of locations deemed problematic during the winter season such as bridges, inclines, ramps, and dangerous curves/intersections. Currently, there are 17 anti-ice routes within the snow plan network.

Bridge Routes

Within the City of Columbus, there are over 200 bridges requiring maintenance and monitoring throughout the winter season. During specific weather conditions or due to timing between events, the approach will be to extract the bridges from the anti-ice routing and monitor/service these items only.

Service around Schools (SAS)

Not to be confused with school bus routes, roadways around schools are serviced where children would be picked up and dropped off. If school has been confirmed to be in session, street maintenance staff is dispatched to service these roadways before school begins. "Service around Schools" treats roadways as Priority 1 routes.

Hot Spots

Hot Spots consist of inclines, dangerous curves/intersections, and other locations which have been deemed problematic in the past and have been extracted from the anti-ice routes. Hot Spots can be dispatched for anti-icing or de-icing purposes. Hot Spots differ in that they do not include bridges and are more location-based than linear/route focused.

In-Event Performance Indicators/Goals

Priority 1 and 2 Roadways

During an event, the goal is to maintain traffic flow as safely as possible. Fair and passible conditions are the indicators assigned to Priority 1 and 2 roadways as the most important focuses will be to reduce the ability for ice to bond to the pavement and control accumulation. Efforts are taken to minimize ice buildup or bonding; however, it should be noted that snow will accumulate. Once the event has ended, Priority 1 and 2 roadways are serviced until in good bare/wet pavement conditions.

Once the snowfall or inclement weather begins to subside, and the event has been brought under control, the goal is to have all City of Columbus Priority 1 roadways recovered to a fair and passable condition within 12-16 hours.

Once staff transitions into the Priority 2 routes, the goal is to have those roadways in fair and passable condition within 10-12 hours.



Example of a Priority 1 roadway being serviced to fair and passable condition wheel tracks exposed, minimal ice formation and traffic still continues to move.



Example of a Priority 2 roadway in fair and passable condition, driving lanes have been plowed and treated with salt, pavement exposed in some areas.

Priority 3 Roadways

Every snow and ice control event is different and is accompanied by challenges that can impact portions of the City of Columbus independently. Different strategies may be implemented based on pavement conditions, and weather forecasts. It is the goal to fully transition (if deemed necessary) into the Priority 3 roadways 24-48 hours after the event has ended. Priority 3 roadways are serviced by plowing only.

Bicycle Lanes, Sidewalks, Alleys and Parking Lots

Bicycle Lanes

Currently, snow & ice control for on-street bicycle lanes are located mainly on arterial and collector roadways and are serviced within the systematic snow and ice control approach. Although there is no enhanced prioritization for bicycle lane service, provisions have been made to assist with travel. Smaller equipment has been equipped with anti-icing capabilities to reduce ice buildup in narrow protected bike lanes as well as assigning staff to monitor and remove snow from bike lanes when snow accumulates after initial service has commenced. Staff will make every effort to plow through the bike lane to the curb or shoulder whenever possible.

During swift, heavy snowfall, however, bike lanes may become snow packed. In these conditions, bicyclists can count on the vehicle travel lane to likely be the clearest option and should be prepared to ride in a shared lane condition during snow season.

Alleys

Due to the restricted access and low traffic volumes, alleys are not serviced as part of the snow & ice control process unless there are unusual circumstances validated by way of inspection by trained staff.

Sidewalks

The City of Columbus is responsible for the sidewalks adjacent to city owned property; all other sidewalk maintenance is the responsibility of the adjacent property owner per Columbus City Code Section 905.04

Parking Lots

The Department of Recreation and Parks maintains city owned parking lots.

Driveways

The resident, business owner or property owner is responsible for opening driveways that are plowed closed by city snow and ice control efforts. Snow from plowing driveways or opening driveways should not be plowed into the street.

Post Service Expectation

Before moving from one priority roadway type to the next, the City of Columbus strives for standardized conditions citywide (assuming inclement weather has or is ending).

Priority 1 and 2 Roadways

Bare/wet pavement surface is the general condition. There are occasional areas having snow or ice accumulations resulting from drifting, sheltering, cold spots, frozen melt-water, etc. Prudent speed reduction and general minor delays are associated with traversing those areas.

Priority 3 Roadways

Snow &/Or Slush Covered with wheel tracks exposed: Accumulations of loose snow or slush which may become packed and bonded may be present. There are moderate delays due to a general speed reduction. However, the roads are investigated to ensure they are passable.

Generally, the roads in this category are not plowed or treated until the accumulation reaches four inches, and the forecasts do not indicate conditions conducive to improvement without service. As such, this level of service only applies when these conditions are met. The Division of Infrastructure will plow residential streets upon the conclusion of each storm as part of their regular duties with the goal of reaching the above levels of service.



Example of a Priority 3 roadway after being serviced, the street is plowed from curb to curb, around parked cars.

After a snow event ends, staff continues to monitor roadways for icy spots, areas where winds redeposit snow in travel lanes and roadways where refreeze potential is high. Personnel may also be dispatched to clear catch basins so that melting snow can run off.

Winter Season Preparation

Extensive training is conducted each fall for personnel engaged in the winter operations program. Training provides hands-on experience and an overview of systems, policies, and procedures. The program provides employees the opportunity to re-acquaint themselves with the vehicles and equipment used in snow and ice removal operations. Overviews of salt utilization programs, weather forecasting system, Snow-Roadway Condition Investigators program and other related topics are covered. Service and product representatives are on hand to conduct in-service overviews of specific procedures and equipment in conjunction with training provided by experienced supervisory personnel.

Annual training consists of:

- Snow Warrior training – classroom and hands-on training
- Snow Committee Meetings
- Dry runs of all routes
- Roadway Condition Investigators training
- Dispatcher training
- Inspection training peer-to-peer training – hands-on for non-experienced personnel, division, and non-division; provides a half-day session with an experienced equipment operator

Emergency

The Mayor of Columbus may declare a snow emergency. A snow emergency prompts special parking restrictions to be in effect to allow for thorough clearing of major arteries and more comfortable traffic flow. Due to the difficulties encountered plowing arterial streets where vehicles are parked alongside the curb, a parking ban is put into effect, and local law-enforcement officials will enforce these parking restrictions. Snow can be windrowed, picked up and hauled away in the Central Business District.

Snow Emergency Streets

Street	From	To
Cleveland Avenue	Jack Gibbs Blvd	Oakland Park Ave.
N. Fourth St.	Warren St.	Hudson St.
N. High St.	Russell St.	Oakland Park Ave.
North Broadway	SR – 315	I – 71
Oakland Park Ave.	Maize Rd.	Cleveland Ave.
Summit St.	Hudson St.	Warren St.
Weber Rd.	Indianola Ave.	Westerville Rd.
E. Broad St.	I – 71	Nelson Rd.
Fifth Ave.	Glenn Ave.	Osborn Ave.
Indianola Ave.	Hudson St.	Oakland Park Ave.
E. Main St.	I – 71	Alum Creek Dr.
W. Broad St.	Wilson Rd.	SR – 315
Sullivant Ave.	Demorest Rd.	SR – 315
S. High St.	Livingston Ave.	SR – 104
E. Whittier St.	S. High St.	Lockbourne Rd.
Livingston Ave.	S. High St.	Alum Creek Dr.

Snow Level Emergency

Pursuant of Attorney General Opinion 86-023, the Sheriff of a County may declare a Snow Emergency and temporarily close County and Township Roads within his jurisdiction for the preservation of the public peace. Attorney General opinion 97-015 allows the Sheriff to close State and Municipal Roads.

Snow alerts will be classified as one of the following levels:

- Level 1: Roadways are hazardous with blowing and drifting snow. Roads are also icy. Drive with caution.
- Level 2: Roadways are hazardous with blowing and drifting snow. Only those who feel it necessary to drive should be out on the roadways. Contact your employer to see if you should report to work.
- Level 3: All roadways are closed to non-emergency personnel. No one should be out during these conditions unless it is absolutely necessary to travel. All employees should contact their employers to see if they should report to work. Those traveling on roadways may subject themselves to arrest.

Communication/Service Requests

The Department of Public Service's Public Information Officer handles all media requests for on-site audio or video footage and provides guidelines for all other media contacts. They also provide information to the 311 Customer Service Center. The Public Information Officer works in conjunction with the Administrator, and Transportation Operations Coordinator to obtain the most current and concise information available.

Warrior Watch

Warrior Watch is a web based computer application utilizing GIS (Geographic Information System) and AVL (Automatic Vehicle Location) technology. This application will provide the Division of Infrastructure Management and the public with timely updates as to snow & ice service statistics and roadway service priorities.

Snow service priorities are maintained on a centerline feature layer within GIS. This information is then joined with AVL snow plow location and sensor readings (e.g., Snow Plow - Up or Down; and Salt Application Spinner - On or Off) to display when a street was last travelled, serviced, and its service priority. Various other statistics and reports are then also available to help determine the effectiveness of service strategies, and productivity during a snow and ice event.

Warrior Watch is available to the public via a link on the City's and Department's internet site, or by logging in directly at <http://warriorwatch.columbus.gov>.