Columbia Winter Weather Response Late 2025 - Early 2026

Pre-Council Worksession

11-17-2025
Columbia Winter Weather Response

Richard Stone
Engineering & Operations Manager
City of Columbia Public Works Department

Winter Weather Information 2025-2026

This information is not static and changes over time.

Winter Weather Information 2025-2026

From a high level perspective, everything we do is centered on providing the best possibility for people to achieve safe travel.

That is home base.

Winter Weather Information 2025-2026

We do not control:

- Mother nature
- How other agencies respond (MoDOT and Boone County responses impact travel within and around the City)

Winter Weather Information 2025-2026

We do control:

- Our resources
- Our planning
- How we react to what is happening

Winter Weather Information 2025-2026

Hierarchy of priority routes points first toward efficient travel from an emergency response perspective, then everything else follows from there.

Winter Weather Information 2025-2026

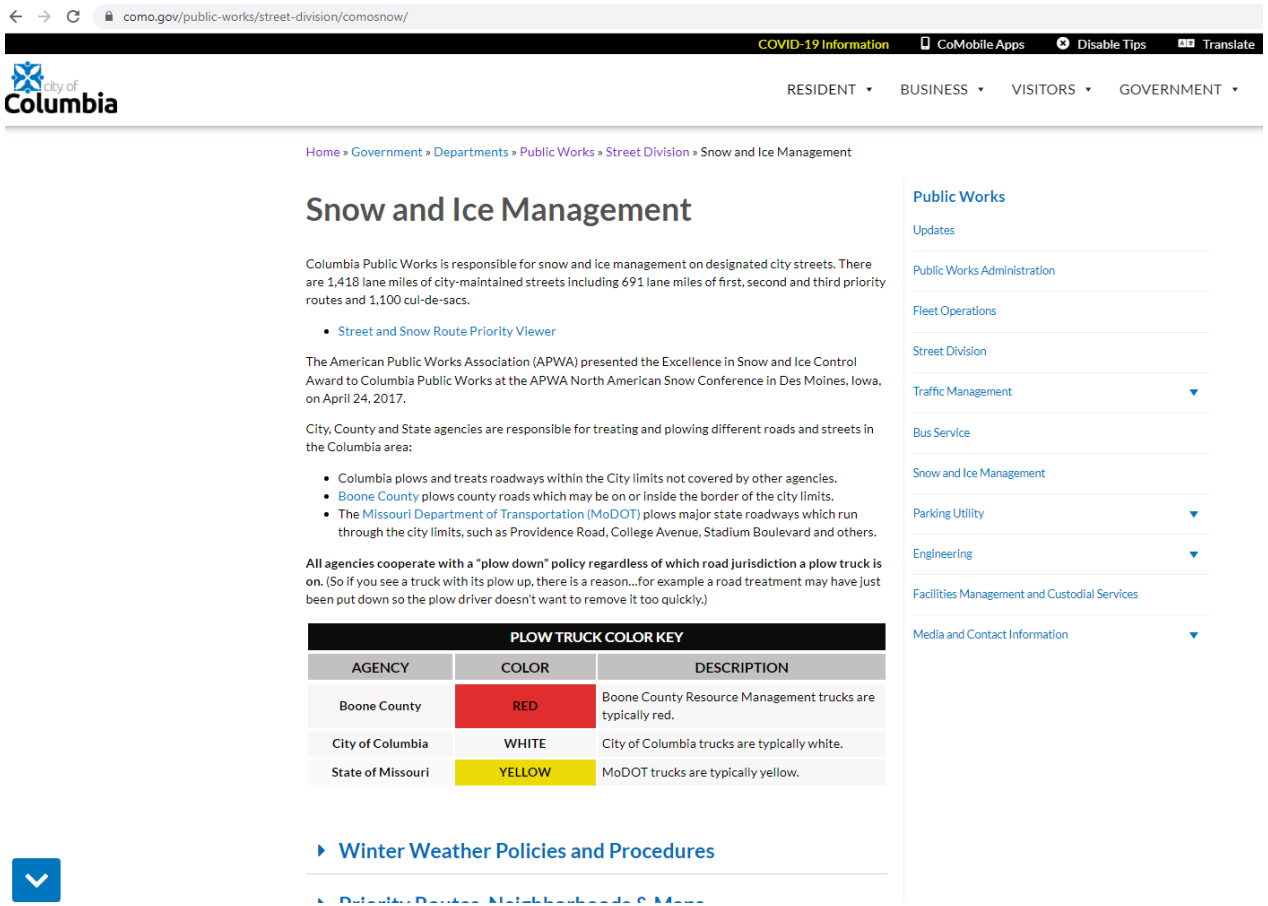
- Equipment and other resources have been built towards first, second and third priority routes over last decade plus for the most efficient response possible with available resources.

Winter Weather Information 2025-2026

- Equipment and other resources have been built towards first, second and third priority routes over last decade plus for the most efficient response possible with available resources.
- Any winter weather response for any agency is based on: available resources, establishing a plan before winter, and proper execution during winter.

Winter Weather Information 2025-2026

www.comosnow.com



Winter Weather Information 2025-2026

- Internally, we treat winter weather events as if the event is a disaster situation -- because that’s what they are.

Winter Weather Information 2025-2026

Incident Command System (ICS) typically initiated if 2+ full shifts expected

otherwise email with information

ICS/email sent to BCJCSupervisors@boonecountymo.org with a bunch of people copied for communication

Winter Weather Information 2025-2026

ICS updated every 12 hours (shift change) or major changes

Example ICS information

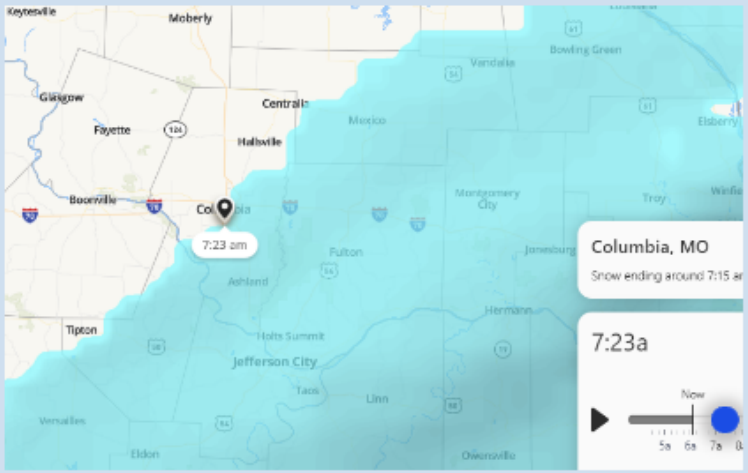
city of Columbia Public Works

INCIDENT BRIEFING (ICS 201)

Snow and Ice Management

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated:
Winter storm beginning 3/10/2022	Update #3	Date: 03/10/22 Time: 07:00

4. Map/Sketch (include sketch, showing the total area of operations, the incident site/area, impacted and threatened areas, overflight results, trajectories, impacted shorelines, or other graphics depicting situational status and resource assignment):



5. Situation Summary and Health and Safety Briefing (for briefings or transfer of command): Recognize potential incident Health and Safety Hazards and develop necessary measures (remove hazard, provide personal protective equipment, warn people of the hazard) to protect responders from those hazards.

Snow overnight, fluffy with some drifting. Light to heavy rates. Approximately 5 inches accumulation, all precipitation forecast to end by 0800. A 28 person crew will be focused on priority routes through the morning. Additional resources may be added through the day due to volume of snow fall. Projected temperatures to rise above freezing mid-afternoon with some possible sun later today. We anticipate transitioning to subward streets at some point with some resources around mid-day depending on progress along priority streets. Temperatures forecast to fall to around 10 overnight Friday to Saturday.

6. Prepared by: Name: Richard Stone Position/Title: Engineering & Operations Manager

ICS 201, Page 1 Date/Time: 3/11/2022 07:00

city of Columbia Public Works

INCIDENT BRIEFING (ICS 201)

Snow and Ice Management

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated:
Winter storm beginning 3/10/2022	Update #3	Date: 03/10/22 Time: 07:00

7. Current and Planned Objectives:

28 person crew reports. Plow and treat 100 lbs per lane mile.

8. Current and Planned Actions, Strategies, and Tactics:

Time:	Actions:
03/10/22 0700	26 person crew scheduled to respond to conditions.
0700-1632	Active snow through the day. Pavement temperatures above freezing. Pretreat priority route.
1700	Pavement temperatures drop to freezing
1900	23 person crew responding to conditions. Focus priority routes overnight.
03/11/22	
0330	approx 6 inch, light to heavy rate fluffy snow, consolidating
0500	Medium rate. Consolidated to 5 inches accumulation.
0600	Snow tapers to spitting around 0600
0700	28 person crew reports

6. Prepared by: Name: Richard Stone Position/Title: Engineering & Operations Manager

ICS 201, Page 2 Date/Time: 3/11/2022 07:00

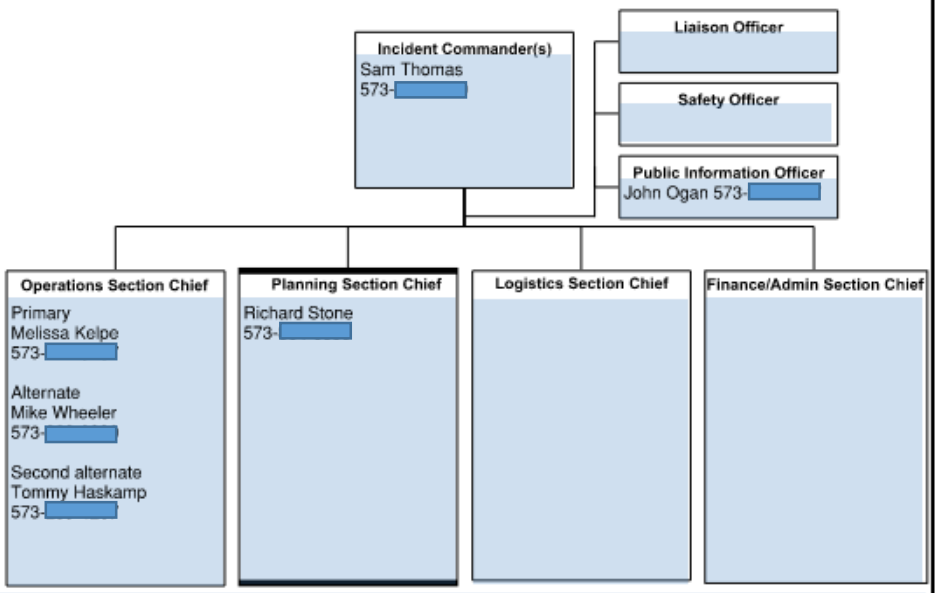
Example ICS information

city of Columbia Public Works

INCIDENT BRIEFING (ICS 201)
Snow and Ice Management

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated:
Winter storm beginning 3/10/2022	Update #3	Date: 03/10/22 Time: 07:00

9. Current Organization (fill in additional organization as appropriate):



6. Prepared by: Name: Richard Stone Position/Title: Engineering & Operations Manager

ICS 201, Page 3 Date/Time: 3/11/2022 07:00

city of Columbia Public Works

INCIDENT BRIEFING (ICS 201)
Snow and Ice Management

1. Incident Name:	2. Incident Number:	3. Date/Time Initiated:
Winter storm beginning 3/10/2022	Update #3	Date: 03/10/22 Time: 07:00

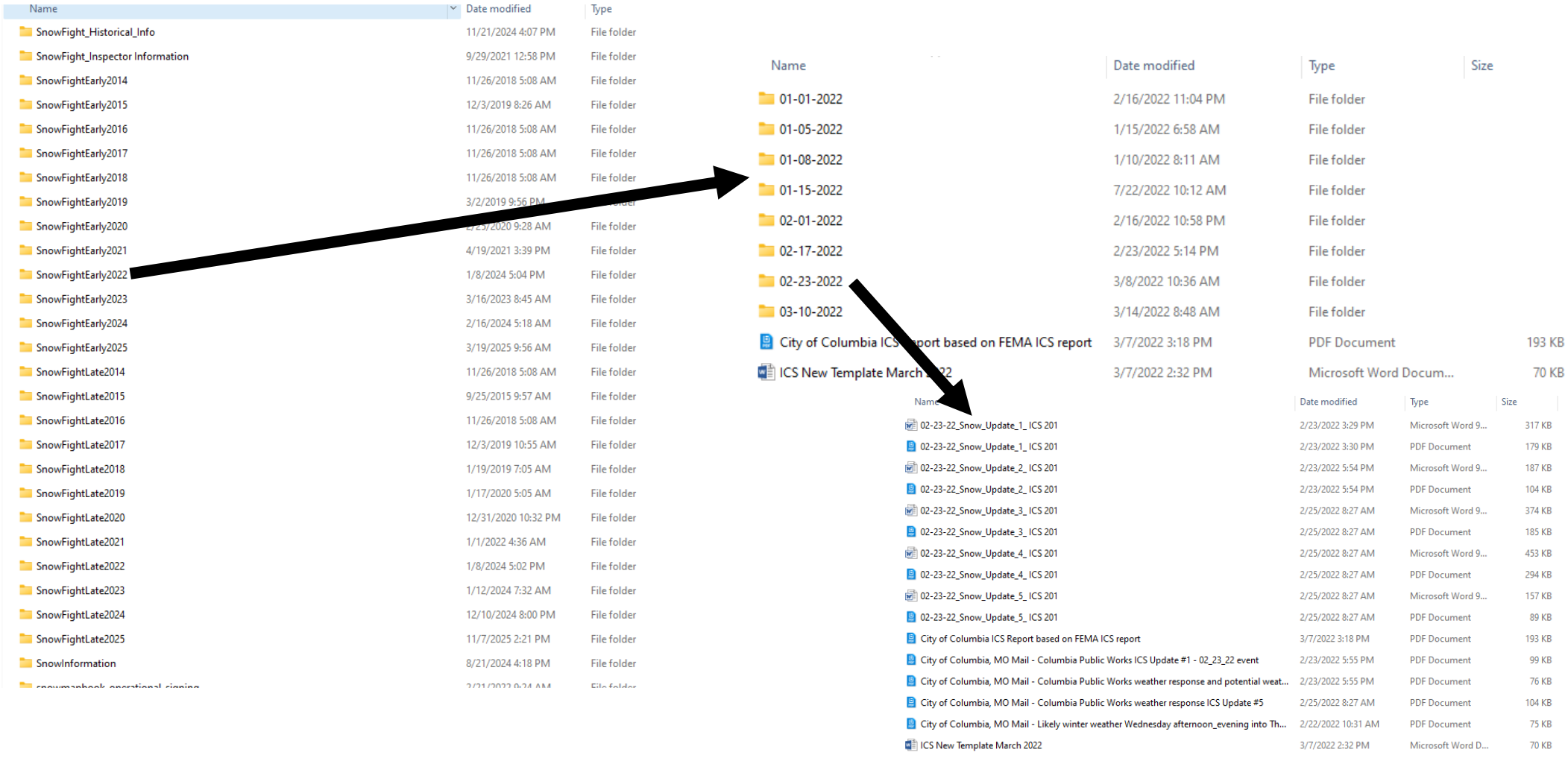
10. Resource Summary:

Resource	Resource Identifier	Date/Time Ordered	ETA	Arrived	Notes (location/assignment/status)
9 - Tandem-axle trucks				☒	1 additional available
6 - single-axle trucks				☒	1 additional available
2 - Class 5 trucks				☒	1 additional available
5 - One-ton trucks				☒	6 additional available
1 - Loader				☒	At salt dome; 1 additional available
Motorgrader with wing plow				☒	available
2 - Skid steer				☒	available
3 - backhoe				☒	available
4-Fleet				☒	
Sewer			day	☐	additional resources to be contacted for availability - subwards
Water			day	☐	additional resources to be contacted for availability - subwards
Parks			day	☐	additional resources to be contacted for availability - subwards
				☐	
				☐	
				☐	
Trucks down				☐	1981S-springs-out;1547-1T-front end, out;1534-1Tuseable if needed, front alignment;
				☐	

6. Prepared by: Name: Richard Stone Position/Title: Engineering & Operations Manager

ICS 201, Page 4 Date/Time: 3/11/2022 07:00

Winter Weather Information 2025-2026



Winter Weather Information 2025-2026

Stats:

- The City currently maintains ~1465 total lane miles
- ~691 lane miles of First (337), Second (205) & Third Priority routes (149)
- 1 salt dome, 5,000 tons

Winter Weather Information 2025-2026

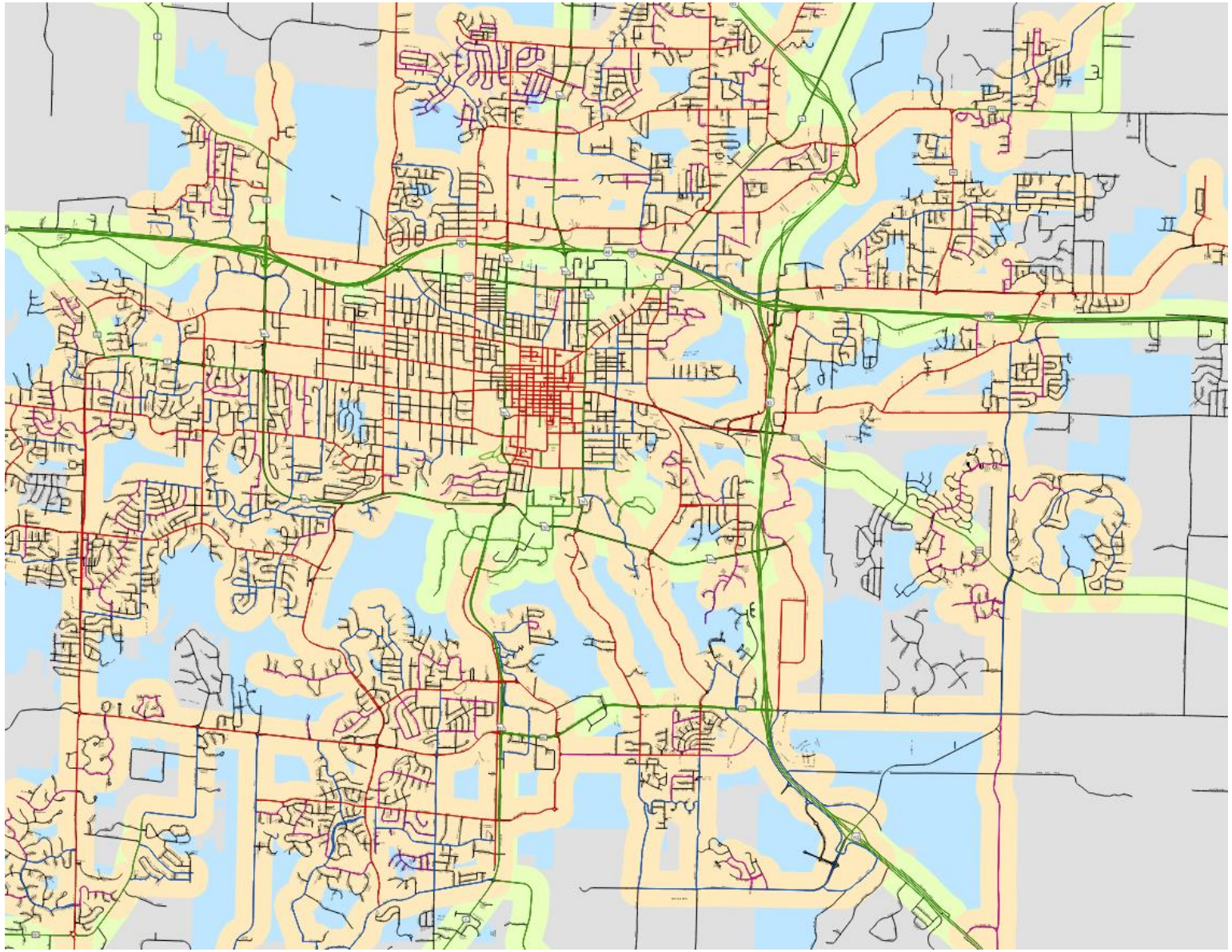
Stats:

- Priority routes, generally continuous operation until near normal conditions. Intention is at least one bare wheel path at all times for First and Second, passable for Thirds nearly all time (operational decision)

Buffer map from Third Priority Routes

Most within approximately 1,000 feet

Target all within 800 feet



Winter Weather Information 2025-2026

Stats:

- 14 Tandem*(3 functional only due to great Fleet assistance), 4 single axle*, 12 one-tons, 5 Class 5
  - 4 Tandems+1 single axle delivery imminent
- 8-30 drivers per shift + other support

Winter Weather Information 2025-2026

Stats:

- Street Division: 45 FTE
- 4 vacancies

Winter Weather Information 2025-2026

Stats:

- Street Division: 45 FTE (43 FTE in 2005)
- 4 vacancies

- Means less than 20 operators with Street Division only, meaning other agency assistance needed

Winter Weather Information 2025-2026

Stats:

- 8-12 inches and more, additional resources ramped up from other departments (backhoes, loaders, other equipment, utilizing people from other parts of the organization, contract haulers)
- Move to “more of entire workforce” critical response – add resources based on event

Winter Weather Information 2025-2026

Stats:

- Most communities target around 20-35 lane miles per operator for continuous operation, but every situation is specific to that community.
- We are at about 35 lane miles for Street Division only and about 25 lane miles with shared resources for most events.

Winter Weather Information 2025-2026

Less than 4” of snow

First, Seconds, Thirds (24/7 operation)

- Curb to curb
- Continuous operation
- Tow vehicles parked on First or Second Priority routes at 2”

Winter Weather Information 2025-2026

What we're trying to get to for these types of events
within 24-36 hours after end of active event

Winter Weather Information 2025-2026

Less than 4” of snow

Neighborhoods during normal business hours after first, seconds and thirds operationally complete

Winter Weather Information 2025-2026

Less than 4” of snow

Neighborhoods during normal business hours after first, seconds and thirds operationally complete

Typically end operations in about 48 hours or less.

Winter Weather Information 2025-2026

4” and greater of snow

First, seconds and thirds

- Curb to curb
- Continuous operation
- Tow vehicles parked on First or Second Priority routes at 2”

Winter Weather Information 2025-2026

4” and greater of snow

Enter neighborhoods after first and seconds are passable and curb to curb. Will have been reaching into neighborhoods with Thirds. May split response (some trucks on first and seconds some in neighborhoods).

All streets plowed and treated to ‘passable’ condition in a methodical manner.

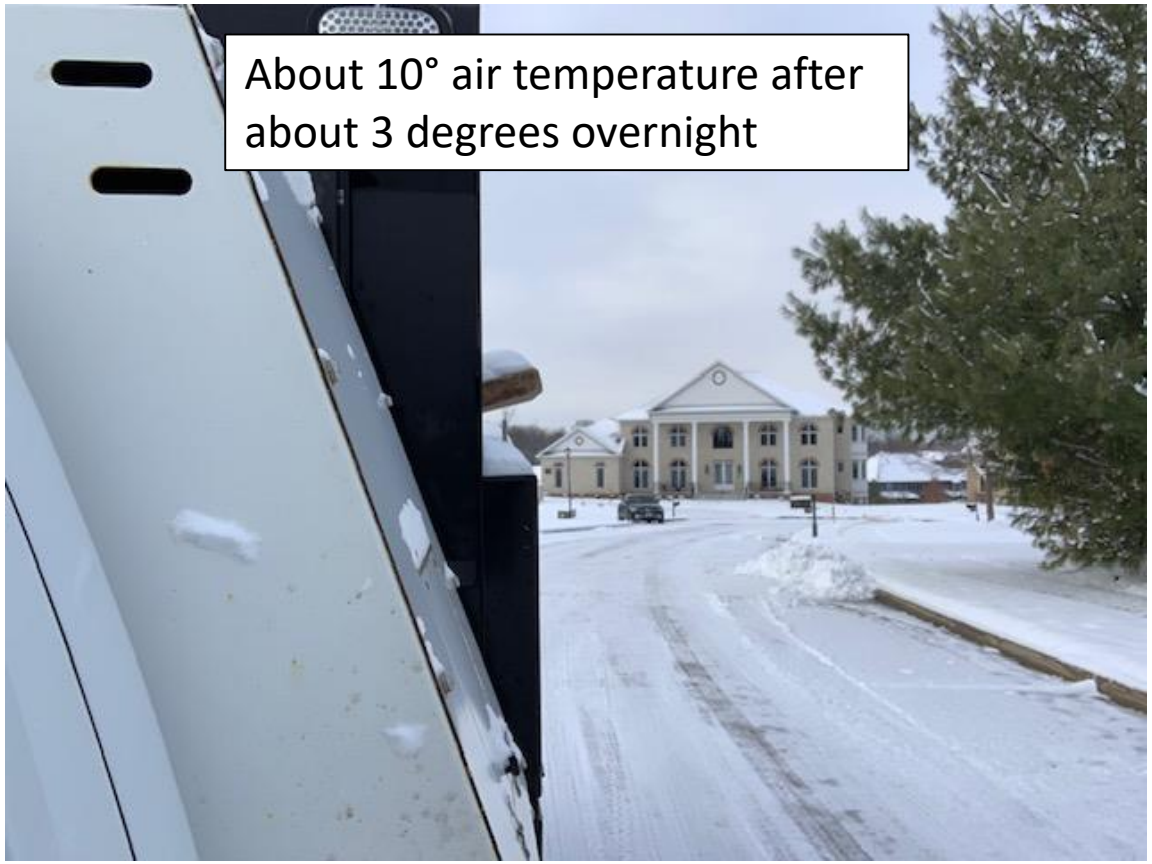
Winter Weather Information 2025-2026

4” and greater of snow

‘Passable’ = passable by a front wheel drive vehicle at slow speed utilizing reasonable winter weather driving

Depending on temperatures – may look like this

Depending upon temperatures, roads may look like this:



These photos were taken about four hours apart.

Winter Weather Information 2025-2026

Council direction, based on a lot of factors. Limiting impact to the environment is a relevant factor.

Hinkson Creek

Collaborative Adaptive Management

Chloride Task Force

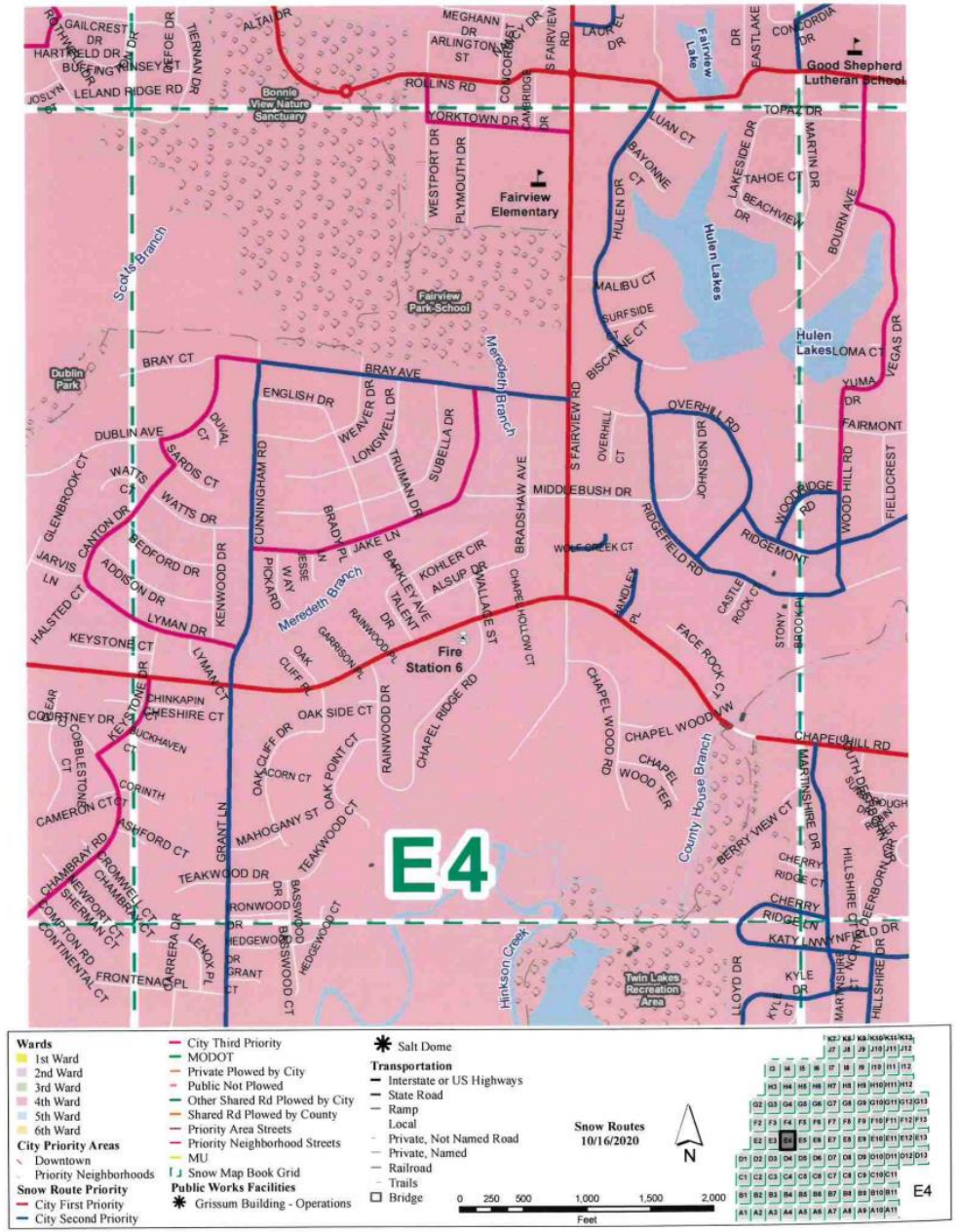
Depending on temperatures – may look like this

Taken about 4 hours apart

Methodical manner

1. Each driver and each inspector has a book with every street.

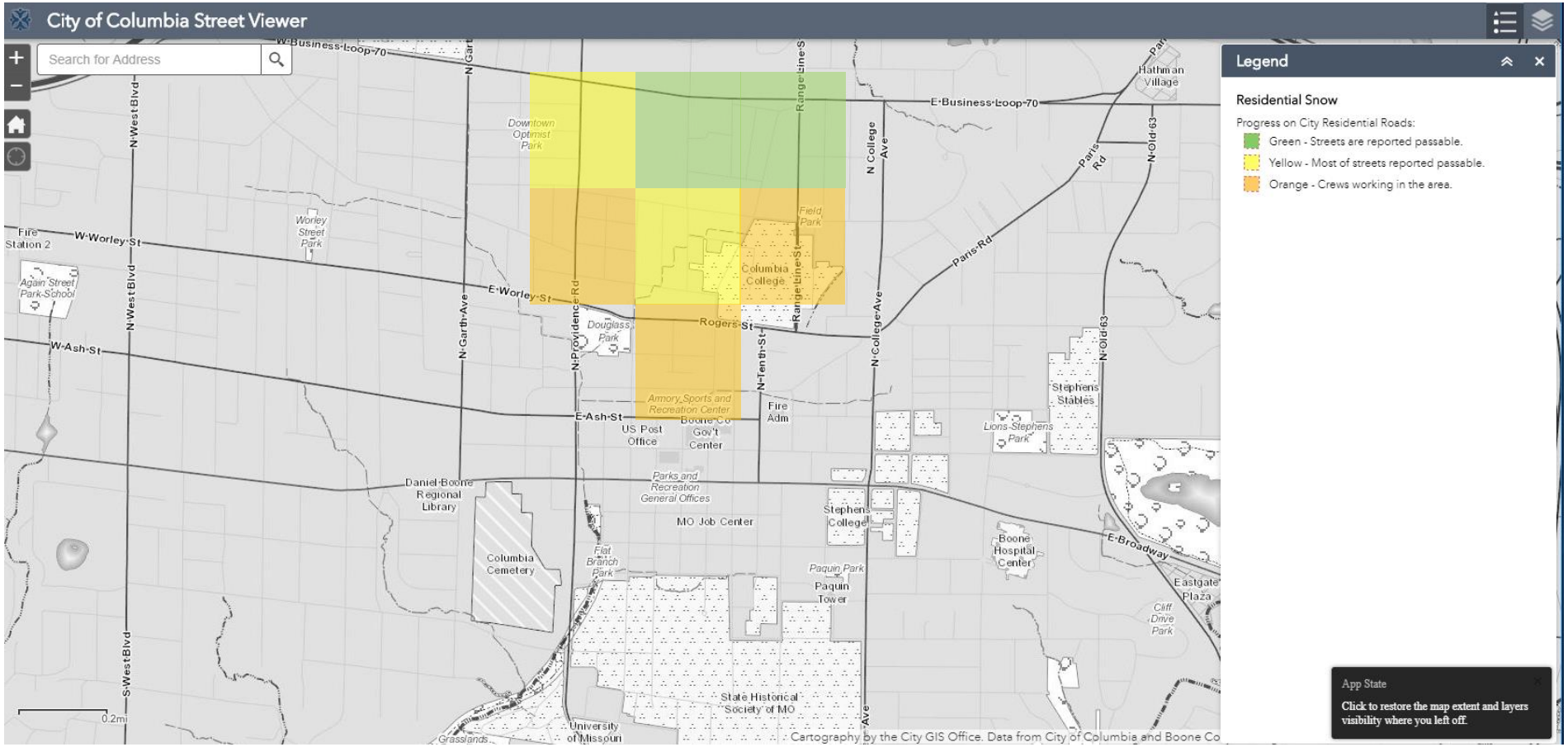
2. Subwards are reported as complete by driver then inspector inspects for passable condition. In process of upgrading tracking equipment for efficiency.



"Subward" grids

Check https://www.como.gov/comosnow/

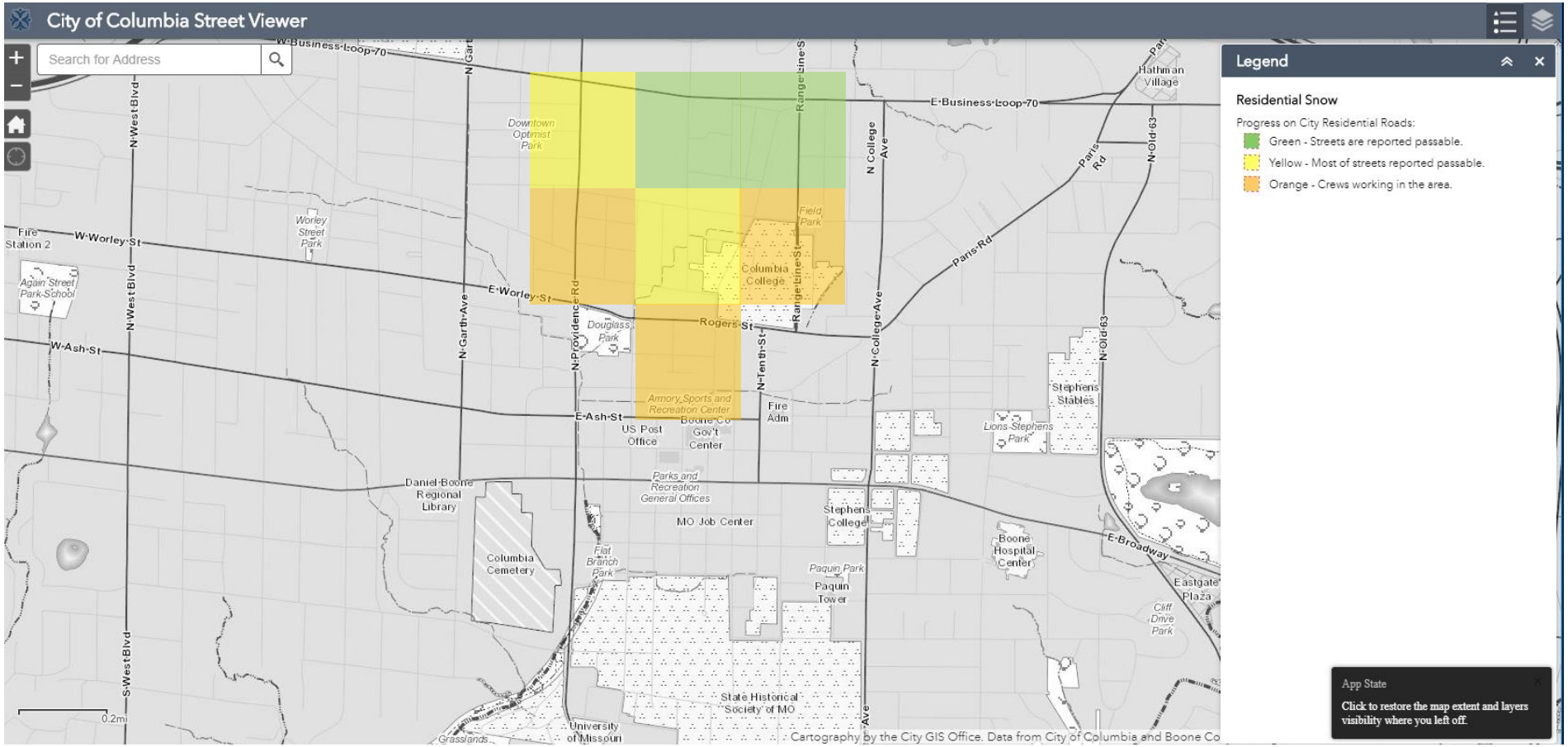
- Public facing map to indicate progress
- Over the years, positive feedback from the public regarding knowledge of progress.



City Street Road Condition Link (will be on main page)

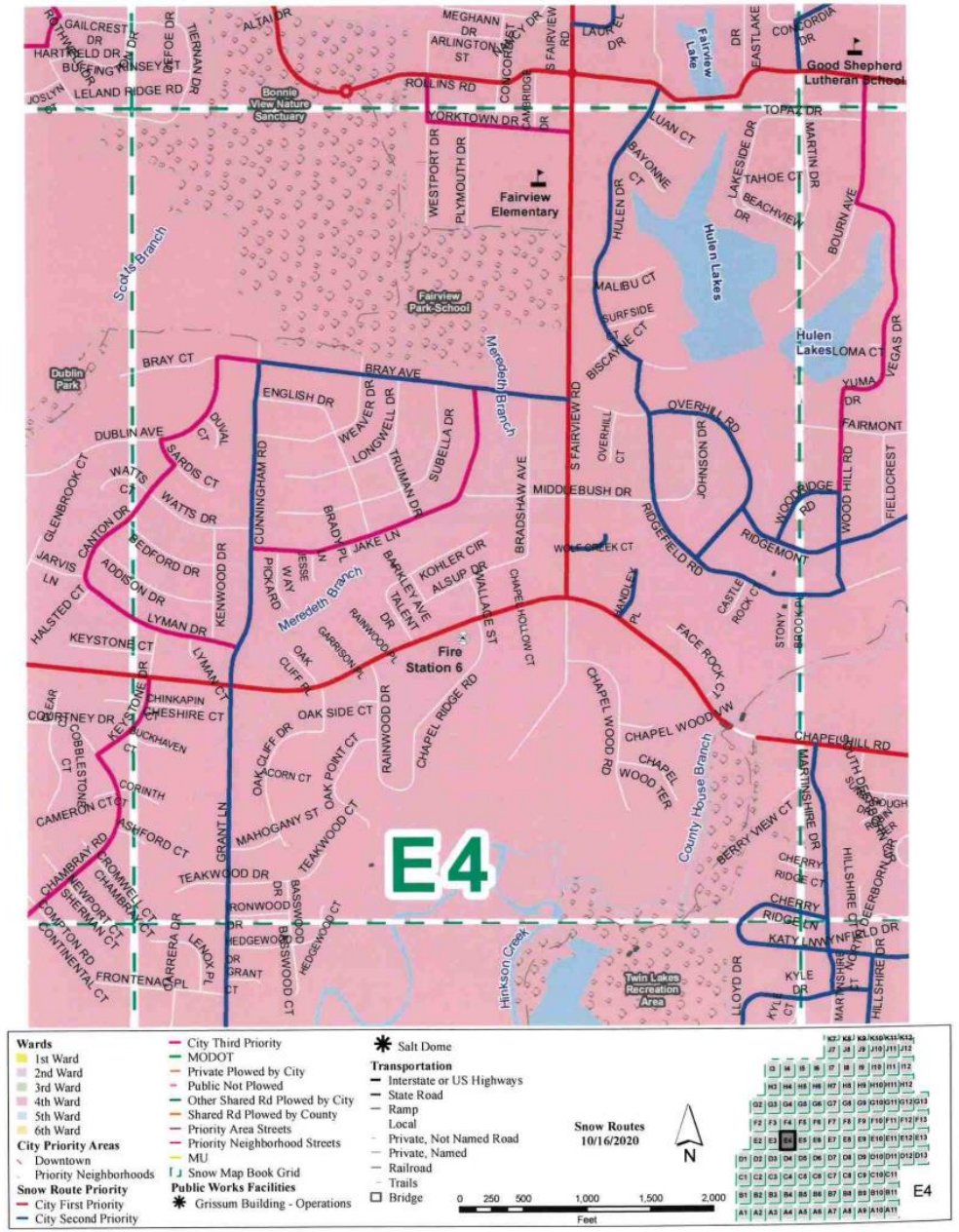
Check https://www.como.gov/comosnow/

- Historically, outside to in one event, then inside to out



City Street Road Condition Link (will be on main page)

If completed and considered passable (all green on the map), we still address calls for service and evaluate conditions for additional response based on the specifics of the event.



"Subward" grids

Winter Weather Information 2025-2026

Methodical approach.

Have a plan – work the plan.

Winter Weather Information 2025-2026

There is no ‘typical’ storm. Every one is different.

However, there are some guidelines we follow based on FHWA research.

Winter Weather Information 2025-2026

MoDOT EPG

- https://epg.modot.org/index.php/133.5_Operator%E2%80%99s_Guide_for_Anti-Icing

Example guidelines for a ‘Type 3 Event’

Table 133.5.3.6.3 Type 3 Winter Event: 1 – 6 in. of snow/frozen precipitation in 24 hours OR a trace to 1/2 in. of ice

Continuous Operations Routes

Pavement Temperature Range and Trend	Initial Operation				Subsequent Operations					Comments
	Pavement surface at time of initial operation	Maintenance action	Salt spread rates		Maintenance action	Salt spread rates				
			Pre-wetted solid salt (lb/lane-mile)	Brine (gal/lane-mile)		Pre-wetted solid salt (lb/lane-mile)		Brine (gal/lane-mile)		
						Light snow	Heavier snow	Light snow	Heavier snow	
Above 32° F, steady or rising	Dry, wet, slush or light snow cover	None, see comments	-	-	None, see comments	-	-	-	-	**1)** Monitor pavement temperature closely for drops toward 32° F and below. **2)** Treat slick patches if needed with pre-wetted salt at 100 lb/lane-mile or brine 44 gal/lane-mile; plow if needed.
Above 32° F, 32° F or below is imminent; *ALSO* **20° to 32° F,** remaining in range	Dry	Apply brine or pre-wetted salt	100	44	Plow as needed, reapply brine or pre-wetted solid salt when needed	100	200	44	88	**1)** Applications will need to be more frequent at lower temperatures and higher snowfall rates. **2)** Do not apply brine onto heavy snow accumulation or packed snow. **3)** After heavier snow periods and during light snowfall, reduce salt rate to 100 lb./lane-mile or 44 gal./lane-mile brine; continue to plow and apply salt as needed
	Wet, slush, or light snow cover	Apply brine or pre-wetted salt	100	44						
10° to 20° F, remaining in range	Dry, wet, slush or light snow cover	Apply pre-wetted salt	200	-	Plow as needed, reapply pre-wetted solid salt when needed	200	250	-	-	**1)** Reduce salt rate to 200 lb./lane-mile after heavier snow periods and during light snowfall; continue to plow and apply salt as needed. **2)** Liquid calcium chloride may be used for pre-wetted salt at colder temperatures
Below 10° F, steady or falling	Dry or light snow cover	Plow as needed	-	-	Plow and apply salt/abrasive mix as needed	-	-	-	-	As pavement becomes slick, apply salt/abrasive mix to enhance traction. Salt will have limited melting power at these temperatures.
***Notes:* SALT APPLICATIONS. 1)** Time initial and subsequent chemical applications to *prevent* deteriorating conditions or development of packed and bonded snow. **2) Anticipate increases in snowfall intensity. Apply higher rate treatments prior to or at the beginning of heavier snowfall periods to prevent development of packed and bonded snow. 3)** Apply salt ahead of traffic rush periods occurring during storm. **PLOWING.** If needed, *plow before salt applications* so that excess snow, slush or ice is removed and pavement is wet, slushy or lightly snow-covered when treated.										

Winter Weather Information 2025-2026

Always limitation on equipment and resources and every storm is different, but generally targeting those guidelines for effective treatments.

Winter Weather Information 2025-2026

Around 6” and greater of snow

Downtown removal may be triggered

(depends on what’s happened before and what’s coming – probably will be around 8”)


TIGER
STEAKS
SEAFOOD
ONE CALL HAULS IT ALL
573-874-6291
644K

Winter Weather Information 2025-2026

12”+ and greater of snow

Neighborhood streets will probably be delayed to about the third day to start

First and seconds are going to take at least two days.

Communication regarding emergency response to and from locations critical – internal work with ICS planner or designated liaison person

Winter Weather Information 2025-2026

Long(er) term horizon:

Winter Weather Information 2025-2026

Long(er) term horizon:

- What we have been doing is not wrong. In fact it is just about exactly correct given the resources we have available to address the situation.

…however…

Winter Weather Information 2025-2026

Long(er) term horizon:

- If we are doing it the exact same way five years from now, we will be doing it wrong.

Winter Weather Information 2025-2026

Long(er) term horizon:

- Evaluate each year what is the best way to examine first, second and third priority
- Discuss whether additional parking modifications would improve our approach (internal structure, external communication, public sentiment/voluntary compliance, etc.)

Winter Weather Information 2025-2026

Long(er) term horizon:

- Priority neighborhoods – benefits and impacts. They require a local contact to coordinate the removal of parked cars from streets, improving our overall response time.
- It requires effort and collaboration from both our staff and local contacts.

Winter Weather Information 2025-2026

Long(er) term horizon:

- Based on Council direction have explored a pilot for subdivisions or neighborhoods expressing a desire to manage their own winter weather response.
- This has been explored, but no subdivision has yet taken steps to initiate a pilot program for this purpose.

Winter Weather Information 2025-2026

Long(er) term horizon:

- Potential for blower(s). Horizon ~2027-2028 winter. Several reasons.
- Demo of blower unit downtown scheduled this winter, but several logistic challenges.
- Evaluating potential for belly plows.

Winter Weather Information 2025-2026

Smaller scale blower unit

Loader mounted blower unit

Winter Weather Information 2025-2026

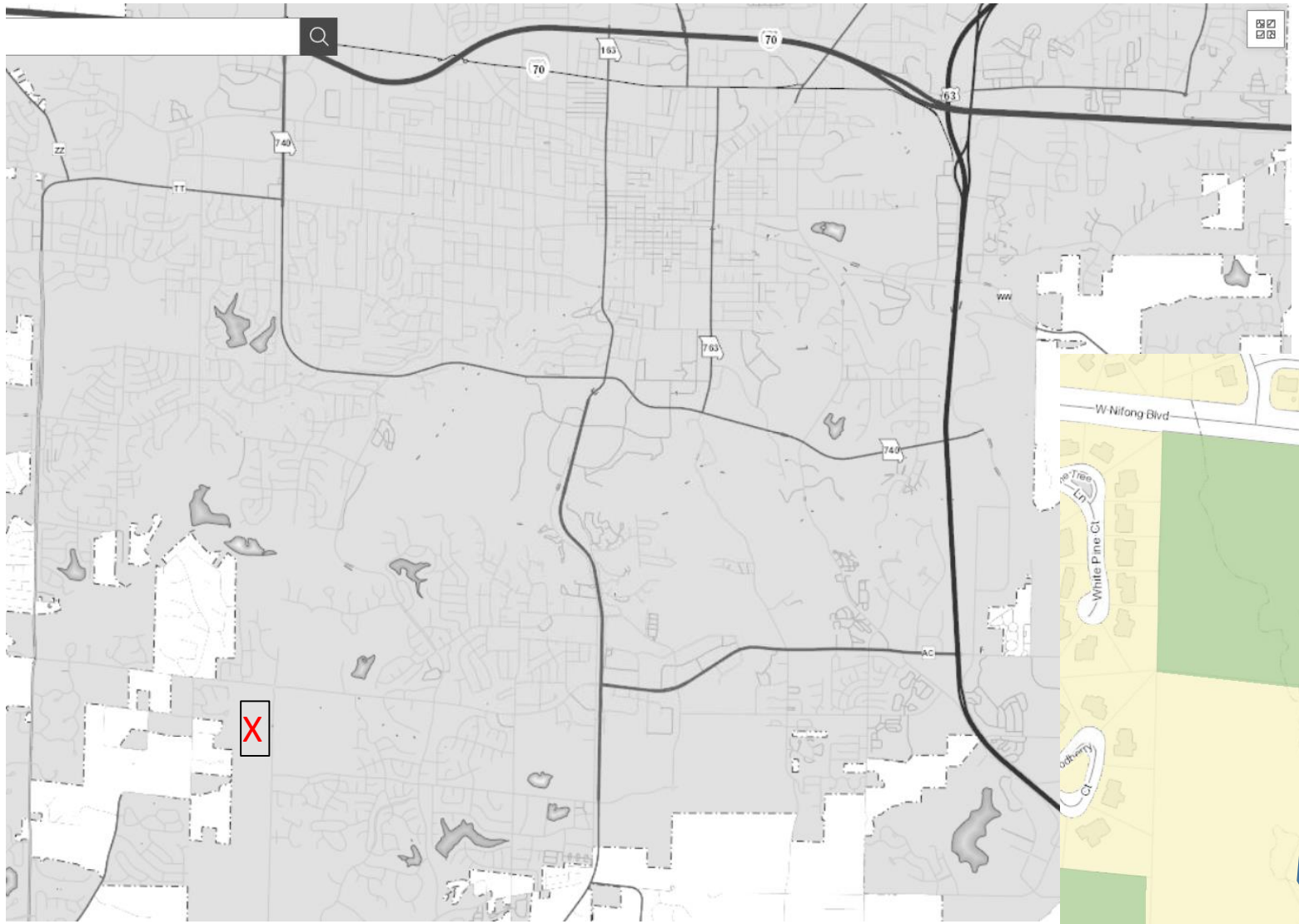
Long(er) term horizon:

- We are currently assessing the effectiveness of potassium acetate (currently being used at the airport) and calcium-magnesium acetate or magnesium chloride for use by us – requires changes for storage, delivery and equipment modifications

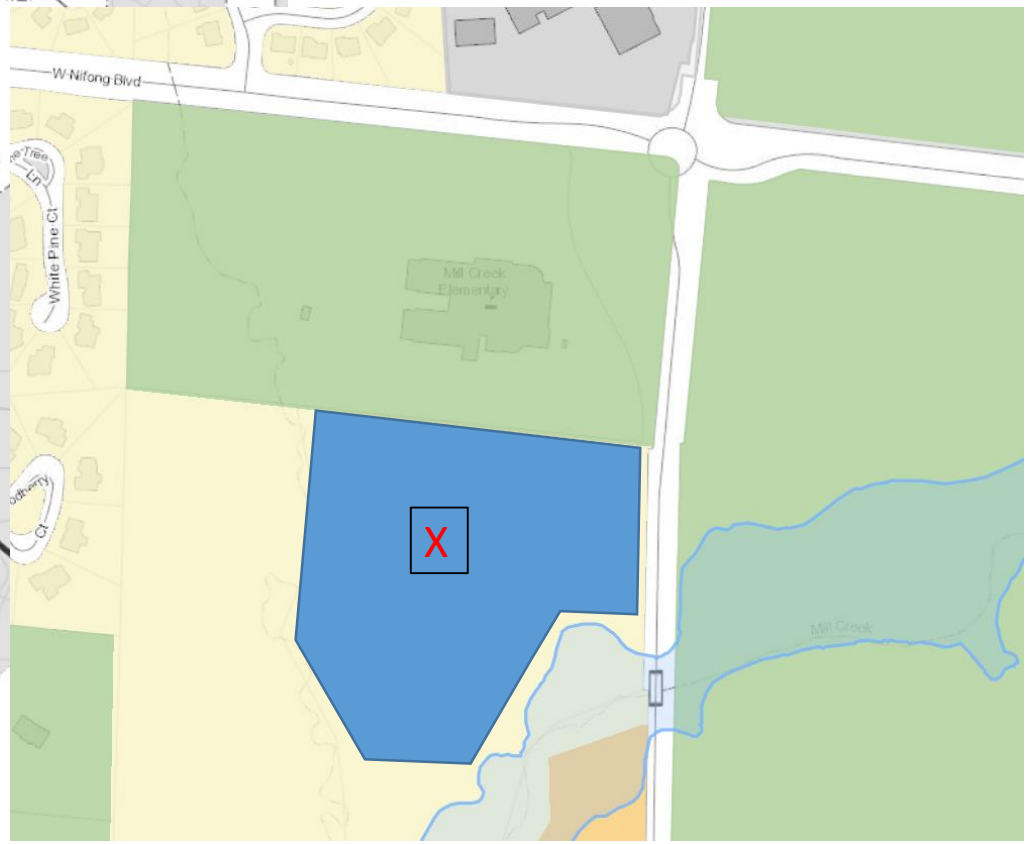
Winter Weather Information 2025-2026

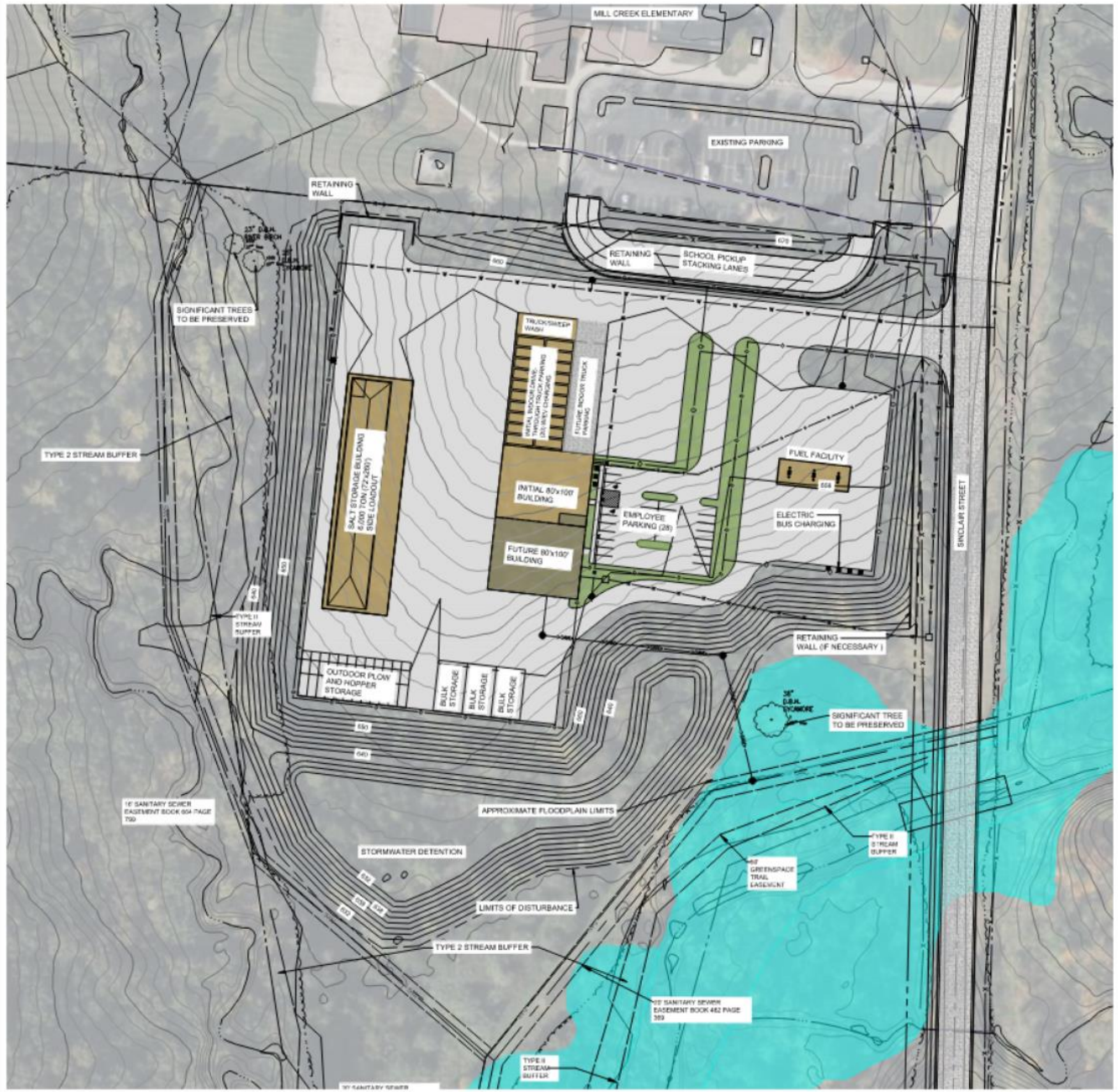
Long(er) term horizon:

- New salt dome facility in the south (will help improve response times everywhere). Opportunity for stockpile of pretreated magnesium chloride or other options.



Location of future new salt storage and operations facilities – southwest Columbia.





city of Columbia
Public Works

CITY OF COLUMBIA
MUNICIPAL SERVICES CENTER SOUTH

CONCEPT MASTER PLAN

FEBRUARY 2024

NARRATIVE:

THE FULL MASTER PLAN INCLUDES THE INITIAL PHASE SALT STORAGE BUILDING ALONG WITH NEW MAINTENANCE BUILDINGS AND A FUEL CANOPY.

BELOW ARE SOME KEY ITEMS:

1)	SALT STORAGE BUILDING SIZE:	18,720 SF (72' x 260')
2)	SALT STORAGE VOLUME:	6,000 TON
3)	INDOOR TRUCK PARKING W/EV CHARGING:	20 TRUCKS (FUTURE EXPANSION 10 ADDITIONAL)
4)	MAINTENANCE BUILDING:	8,000 SF (80' x 100')
5)	FUTURE MAINTENANCE BUILDING EXPANSION:	8,000 SF (80' x 100')
6)	OUTDOOR PLOW AND HOPPER STORAGE:	SPACE TO ACCOMMODATE AS NEEDED
7)	BULK STORAGE:	TONNAGE AS NEEDED BASED ON PRODUCT
8)	APPROXIMATE AREA DISTURBED:	10.7 ACRES
9)	APPROXIMATE CUBIC YARDS OF EARTHWORK:	70,000

10) FACILITY WILL UTILIZE CITY UTILITIES.

11) A TREE AUDIT WAS COMPLETED BY THE CITY AND SIGNIFICANT TREES WILL BE PRESERVED.

12) THE ADJACENT FLOOD PLAIN AND STREAM BUFFER CORRIDORS WILL BE PRESERVED.

13) ROOF OF BUILDINGS, WHERE POSSIBLE, WILL BE DESIGNED TO SUPPORT PHOTOVOLTAIC PANELS FOR ELECTRIC GENERATION ON SITE.

14) POSSIBLE FUTURE SCHOOL PICK UP STACKING LANES PROVIDED TO RELIEVE CONGESTION ON SINCLAIR STREET DURING SCHOOL DISMISSAL.

N

0 60' 120'
SCALE: 1" = 60'

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city of Columbia
Public Works

CITY OF COLUMBIA
MUNICIPAL SERVICES CENTER SOUTH

CONCEPT PHASE 1 PLAN

FEBRUARY 2024

NARRATIVE:

THE INITIAL PROJECT PHASE INVOLVES CONSTRUCTION OF A NEW SALT STORAGE FACILITY ALONG SOUTH SINCLAIR STREET, JUST SOUTH OF MILL CREEK ELEMENTARY SCHOOL. A FACILITY IN THIS LOCATION WILL ALLOW FOR IMPROVED STREET MAINTENANCE DURING WINTER BY REDUCING THE DISTANCE FOR STREET CREWS TO ACCESS SALT.

BELOW ARE SOME KEY ITEMS PROPOSED:

1) BUILDING SIZE: 18,720 SF (72' x 260')
2) SALT STORAGE VOLUME: 6,000 TON
3) APPROXIMATE AREA DISTURBED: 10.7 ACRES
4) APPROXIMATE CUBIC YARDS OF EARTHWORK: 70,000
5) OUTDOOR PLOW AND HOPPER STORAGE SPACE TO ACCOMMODATE AS NEEDED
6) FACILITY TO UTILIZE CITY UTILITIES. ELECTRIC UPGRADES ALREADY PLANNED FOR THE AREA.
7) A TREE AUDIT WAS COMPLETED BY THE CITY AND SIGNIFICANT TREES WILL BE PRESERVED.
8) THE ADJACENT FLOOD PLAIN AND STREAM BUFFER CORRIDORS WILL BE PRESERVED.
9) BUILDING ROOF, WHERE POSSIBLE, WILL BE DESIGNED TO SUPPORT PHOTOVOLTAIC PANELS FOR ELECTRIC GENERATION ON SITE.
10) FUTURE DEVELOPMENT ON SITE MAY INCLUDE ELECTRIC VEHICLE CHARGING STATIONS.

N

60.00 ft 60' 120'

SCALE: 1" = 60'

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Winter Weather Information 2025-2026

Targeting open 2026-2027 winter – in progress.

Winter Weather Information 2025-2026

Public Works employs a systematic, equitable and methodical approach to winter weather.

The plan has been carefully crafted with a focus on resource management, environmental stewardship, and resident safety. Our commitment lies in faithfully following the plan to achieve those goals.

Winter Weather Information 2025-2026

Many years there are no or one 4 inch snow event

Typically about 1-2% of days (over the last 25 years) retain more than 4 inches of accumulation

That’s about 4-8 days a year on average where it stays around

Winter Weather Information 2025-2026

We are happy when the average or better occurs,
but prepare for other possibilities.

Winter Weather Information 2025-2026

Questions ?