



Department Source: Public Works

To: City Council

From: City Manager & Staff

Council Meeting Date: November 5, 2018

Re: Winter Weather Response for 2018/2019 Winter Season

Executive Summary

Staff has prepared for Council consideration a report concerning snow priority routes for winter 2018/2019, with a recommendation that no additional lane miles of new priority routes be added to the priority system list beyond a section of Ballenger Lane-Clark Lane that the City has taken over for maintenance from the Missouri Department of Transportation as part of a CIP project.

Discussion

The efficiency of snow removal operations in Columbia has improved since Council passed an ordinance in 2012 prohibiting parking on signed snow routes when snow is greater than 2" deep; authorized the purchase of new snow removal equipment; and established a rule that after priority streets are deemed passable, residential streets would be plowed and treated, utilizing overtime, when snow is greater than 4". Since these changes, snow priority routes have gradually increased, and although there have been some additional upgrades in equipment, no additional snow removal vehicles have been added to Street division's fleet since FY2014. Personnel additions for the Street Division since FY2010 has been 4 equipment operators.

Staff continues to find ways to improve our response efforts for our citizens. Street Division (44 FTE) is the lead agency for Columbia's winter weather response with a combined fleet of 21 tandem and single axle trucks along with 13 one-ton trucks. We also have a dedicated motor grader with wing plow. Over time, Street Operations' fleet of pick-up trucks has been replaced with one-ton trucks in order to assist with snow removal in residential neighborhoods. These trucks are versatile enough for a wide range of uses during the rest of the year and better suited for snow operations than the previous smaller $\frac{3}{4}$ ton trucks. However, they are not suited for plowing large streets on their own and instead are used to support the larger trucks clearing intersections and neighborhood streets. Depending on the event (typically more than 6" of snow), we may ramp up and utilize rental loaders, contracted truck hauling, skid steers and/or backhoes.

This summer, MoDOT transferred maintenance responsibility to the City a section of Clark Lane and Ballenger (Route PP) as part of the upcoming Ballenger Lane CIP project. With this Ballenger-Clark addition, there are approximately 470 lane miles of priority routes. This is about 1/3 of the entire roadway network, which is approximately 1,350 lane miles.



City of Columbia

701 East Broadway, Columbia, Missouri 65201

The Parks & Recreation department and divisions within Columbia Utilities are gradually incorporating snow removal features when fleet replacements are pursued, such as incorporating hydraulic plumbing for spreaders and plows.

Long term, these additions will help improve operations. Moving forward, the Water Division will be responding to water line breaks as needed with their own truck, spreader and equipment (utilizing salt from the stockpile at the salt dome). The City utilizes drivers and operators from other City departments to complete the roster of operators for plow trucks. For events with 4" of snow or less, Street Division forces are typically able to respond to the event. As weather is forecasted to move into the area for a larger event, more resources from other departments are added in preparation for the response, such as Solid Waste roll-off containers for haul-off as well as operators and other equipment.

Generally, for first and second priority route outcome conditions of 6 inches or less of snow is to have near normal, prudent winter weather driving conditions within 24 to 36 hours of event's end. We also seek to maintain at least one bare wheel path (may still be wet) as much as possible throughout the event, though during portions of active snow, some roads may become totally snow covered. This requires continuous operations during the events as well as focused attention after the active end of the event. If there is between 4 and 6 inches of snow, crews will also methodically plow within neighborhoods with a targeted goal of getting all streets to passable condition within 72 hours of the event's end. Passable condition is defined as passable by a front wheel drive vehicle at slow speeds utilizing prudent winter weather driving. Extenuating circumstances such as extreme cold that can lead to re-freeze or added precipitation might require shifting resources back to first and second priorities.

For events between 6 and 10 inches, additional time is typically necessary to get non-first or second priority streets to passable condition. First priority streets should be near normal within 24-36 hours of event's end and second priority streets to a minimum of passable within 36 hours, with all streets to passable conditions by 96 hours after event's end. For storms greater than 10 inches, focus is on getting first priority routes to passable condition within 36 hours, but specific conditions (especially temperature) dictate response and the state of the street.

Rock salt requires some form of external source along with liquid to become suspended in solution and lower the freezing point. For first and second priority streets (major routes) there is typically more traffic which helps create better overall mixing and solution. As precipitation, such as snow or glazing continues, it dilutes the salt content. Most of the time, re-application of salt and mixing (plow, traffic, some form of heating) is necessary to continue the effectiveness of salt. For local residential streets, when there is snowfall that overwhelms the pavement, there is typically limited traffic to create heat, meaning that some snow pack will likely occur even with salt application. Many times, snow pack can be traversed by front wheel drive vehicles, using prudent winter weather driving at slow speeds.

At certain temperatures, utilizing a pre-wetted salt application can aid in response. All forms of a salt and calcium-chloride solution adjusts the melting point to a lower temperature, but



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these chemicals can react negatively with concrete and bridge structures and increase the rate of pavement deterioration. A beet juice and salt brine solution we are currently using is still detrimental to pavement, but has been found by most agencies to be somewhat less aggressive than salt, and much less so than a calcium-chloride solution.

A high capacity brine making equipment was purchased in 2017 in an effort to make a long term improvement to our response. The brine maker is in place and operational. Long term, the brine maker will allow for rapid production of brine solution and incorporation of a pre-wetted salt application. Prior to this new equipment, we were not able to produce enough brine during winter weather to routinely utilize pre-wetted salt for all trucks due to limited storage. Last year, there were several small events, but temperatures and precipitation were not conducive to fully testing pre-wetted applications.

Staff plans to continue to test the new approach over this winter to gauge the effectiveness. Most of the existing fleet should be capable of incorporating the brine solution with existing saddle tanks. These tanks have been utilized for a calcium-chloride solution in the past when temperatures were very low. While we think the equipment on the trucks is capable of handling the brine process, staff will need to continue to test how well the tanks hold up to the new application during event conditions.

In 2016, staff identified 13 specific routes throughout the city that are not classified as first or second priority routes, but provide a connection inside a neighborhood to other neighborhood streets, or have specific characteristics. For simplicity, these specific routes are termed "Third Priority" routes. As one-ton trucks assist with first and second priority routes, the thought was they would also be able to plow a path on these third priority streets to provide some relief for residents more quickly. Although the path may not be entirely free of snow, it should help to decrease the amount of snow pack on those streets, easing snow removal operations once plows have moved onto neighborhood streets and provide some relief to the neighborhoods. Vehicles will be allowed to continue to park on the street during larger snow events, although we will continue to encourage residents to move vehicles off the street via public outreach.

Due to the lack of significant snow events the previous two years, staff has not had an opportunity to adequately test the effectiveness of this approach. However, there was some confusion regarding these third priority routes with respect to two light glazes/ice last year. At this point, staff believes it would be beneficial keeping the 'third' priority as designed, but if confusion continues, it might be better to eliminate them. The idea was for these routes to be responded to during snow events as one-ton resources allowed. Staff doesn't recommend classifying the third priority routes as second priority routes at this time due to the constraints of not having enough salt on the one-ton trucks to adequately plow and treat the roads in the same way they do the first and second priority routes.

There has been some discussion of Homeowner's Associations performing their own winter weather response for snow and ice control. If Council so chooses, Associations could be allowed to do so.



Staff's main concerns are potential accelerated deterioration of streets, environmental impact due to overuse of material and expectations regarding what will be done and how citizens will know who to contact with concerns. There is also some concern regarding impacts to staffing resources during an actual event in managing individual contacts, as many times decisions need to be made quickly regarding how our response is being implemented on a City-wide basis and we may not be able to dedicate resources to respond. At this time, if there appears to be an Association with a firm desire to commit resources for a defined area, we would recommend piloting with one neighborhood group to see how that works. Street Operations staff could meet with leaders of the group to gauge perspectives and, if applicable, memorialize expectations and see how things develop.

Due to current limitations in manpower and equipment, staff recommends that no additional priority routes be added at this time. If additional priority routes are desired, staff recommends the same mileage be removed from the current priority route system via removal of other streets. Priority routes are required to comply with the no parking requirements when snow is more than two inches deep, so the impact to adjacent property owners should be considered.

Fiscal Impact

Short-Term Impact: No significant additional costs are expected.
Long-Term Impact: Unknown at this time, but funding will be reviewed as part of the annual budget approved by Council.

Strategic & Comprehensive Plan Impacts

Strategic Plan Impacts:
Primary Impact: Not Applicable, Secondary Impact: Secondary, Tertiary Impact: Tertiary
Comprehensive Plan Impacts:
Primary Impact: Not Applicable, Secondary Impact: Secondary, Tertiary Impact: Tertiary

Legislative History

Date	Action
12/04/2017	REP100-17-Winter Weather Response for 2017/2018 Winter Season
10/07/2013	Ord. 21841-Prohibiting parking on priority routes when there is 2 inches or more of snow
10/18/1993	PR174-93A-Establishing a snow removal policy

Suggested Council Action

For information only.