



INFORMATION PACKET MEMORANDUM

To: Members of City Council

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Date: Sept. 15, 2015

Subject: Information Item: Snow and Ice Control Program and Sidewalk Snow Removal Enforcement

EXECUTIVE SUMMARY

This year, the city's official "snow season" begins Sept. 15, 2015, and lasts through May 22, 2016. This memorandum provides City Council with information about the city's Snow and Ice Control Program, the status of the residential street plowing program, and sidewalk snow removal enforcement. This memorandum also describes operational adjustments and changes from previous snow seasons that are part of an ongoing effort to improve the city's overall snow removal operations. The Public Works Department has identified these adjustments and changes as part of a comprehensive third-party review that is currently underway.

The Snow and Ice Control Program goals, as related to the [Transportation Master Plan](#), are to:

1. Keep primary and secondary streets, on-street bike lanes and the off-street path system open.
2. Respond with enhanced service levels when significant snowfall impedes public mobility on and around residential roads, sidewalks and bus shelters.

3. Use materials and equipment efficiently and effectively to help reduce the dangers of traveling in inclement weather.
4. Assist with enforcing the sidewalk snow removal regulations ([Section 8-2-13, B.R.C. 1981](#)), which require all private property owners and residents to clear ice and snow hazards from public sidewalks or walkways abutting their property no later than 24 hours after a snowfall stops.
5. Communicate any delayed opening or early release decisions in advance of city functions before impending severe weather impacts the ability of residents or employees to safely arrive at their destination within the city.

Snow and Ice Control Program information is made available each year through news releases, printed materials, Channel 8 videos, social media, and online at bouldercolorado.gov/public-works/snow.

In 2013, City Council supported moving forward with a residential street plowing pilot program for the 2013-2014 snow season. With voter approval of a 2013 tax initiative that provides additional transportation funding from 2014 through 2030, staff implemented this pilot as a permanent program for 2014 and beyond. These [residential streets](#) have been incorporated and prioritized into the formal snow plow routes and are now treated as normal routes, similar to [primary and secondary arterial streets](#). Staff is working to optimize snow plow routing to further consolidate these residential street additions and identify more efficient ways to incorporate these residential streets into citywide plowing operations.

Due to the increased mileage of multi-use paths added over the past several years, the Public Works Department has also increased maintenance staffing levels to provide a higher level of service on the multi-use path system, including snow and ice control operations.

FISCAL IMPACT

Each year, the Transportation Division's budget accounts for snow and ice control operations for normal weather patterns and events. The adopted 2015 budget for snow and ice control is \$1,067,758. Snow control on city streets is affected by the amount of snow, length of the storm, time of day, temperatures and traffic conditions.

COMMUNITY SUSTAINABILITY ASSESSMENTS AND IMPACTS

- **Economic:** The safety and mobility of residents, workers and consumers is essential to the overall economic health of Boulder. The ability to safely travel roads, sidewalks and/or bus stops affects the city's overall economic health.
- **Environmental:** Snow and ice control operations and sidewalk snow removal efforts support multiple travel choices that benefit the environment. The city's street sweeping program and selection of environmentally sensitive products also help achieve air quality and water quality goals for the city and region.

- **Social:** Mobility is a key component to independence, particularly for people with disabilities, seniors, and schoolchildren who are adversely impacted if roads are unsafe or impassable or if sidewalks, bus stops, and multi-use paths are not adequately cleared of snow. The involvement of these populations in community activities, including employment, is essential.

BACKGROUND

Planning For Snow Season

The city begins preparing for snow and ice removal operations well before the onset of winter. The Snow and Ice Control Program goals are achieved by having full crews available to respond, ensuring equipment is maintained and ready when needed, and by providing a safe environment for employees. Each year, crews are educated and trained on the use of snow removal materials and equipment, and plow operators are recertified on the equipment used to perform snow control operations. Snow removal equipment is calibrated and thoroughly inspected at the beginning of each season, as well as throughout the season. In September of each year, staff also inspects all of the snow routes and addresses any hazards (low branches, potholes, etc) before the snow season begins.

Snow Shift Staffing Schedules and Operations

Public Works maintenance staff is split into two snow crews that serve rotating 12-hour shifts throughout a snowstorm until the primary and secondary routes are cleared for safe travel. In past snow seasons, the Boulder Police Department had been responsible for notifying the Public Works Department's 24/7 standby staff when snow first reached the street surface. The standby staff then called and paged the rest of the snow shift staff, which was required to call back within a specific timeframe to confirm availability. The full snow shift was then expected to arrive for work within a specific timeframe.

Although this 24/7 standby shift practice was effective during previous snow seasons, it often set unrealistic expectations for snow shift employees commuting to and from Boulder during severe weather events. The considerable wait time for snow shift staff to call back and confirm their availability put snow response staff in a reactive mode, rather than a proactive mode.

Beginning this snow season, the Public Works Department's goal is to implement two shift schedules that rotate every 12 hours, beginning and ending at 3 a.m. With a set rotating shift, there will no longer be any need for a standby employee to remain on call 24/7. Transportation management and supervisors will now work directly with the Boulder Police Department to determine snow removal activations outside of normal work hours or on holidays.

Transportation Maintenance management believes that this snow shift schedule change will result in a more proactive and efficient response to snowstorms; a more equitable approach to snow shift staffing; better planning of city maintenance operations and resource allocations; and more predictability for plow operators to safely commute to and from Boulder in inclement weather conditions.

Street Plowing Operations During Snowstorms

During snowstorms, 17 plow trucks are operating on Boulder streets. Sixteen trucks drive predetermined routes while one “floater” truck responds to problem areas and requests from public safety personnel and the community. All 17 trucks have the capability of applying deicing materials.

City procedures give priority to major streets that provide regional travel connections, with two plow trucks assigned to each of the five primary routes. The secondary streets that provide access to schools, hospitals, RTD bus routes, and connections to primary streets are the city's next priority. One plow truck is assigned to each of these secondary routes, beginning at the same time as the primary routes. A [map of the primary and secondary routes](#) is available on the city's snow website.

The Colorado Department of Transportation (CDOT) monitors and maintains portions of some major roads into and out of Boulder, including U.S. 36 north of Jay Road and south of Baseline Road, SH 93 south of the city limits, the Diagonal Highway 119 north of Iris Avenue, and Foothills Parkway between the Diagonal Highway and Valmont Road.

Generally, like other Front Range communities, the City of Boulder does not usually plow all residential streets, since most snow typically melts within a day or two and because this additional level of service would significantly increase costs, impacting other high-priority community services.

The city began its residential street plowing program during the 2014-2015 snow season, incorporating select streets that were prioritized based on an analysis of residential street slopes. When eight or more inches of snow accumulated and temperatures remained below freezing for 72 consecutive hours, the city deployed two trucks to plow residential streets in the [10 predetermined areas with steep slopes](#).

From this snow season onward, these 10 residential areas are now part of the city's normal snow removal operations and will be prioritized along with the primary and secondary streets. This residential street plowing program is funded from a 2013 voter-approved tax initiative that provides additional transportation funding from 2014 through 2030.

Boulder residents can also request snow plowing on a specific street by calling 303-413-7109 or making a [Snow Plow Request](#) using the Inquire Boulder website or mobile app. The city will respond to plowing requests in the order that they are received, with priority given to requests related to an ADA accommodation.

Deicing Materials

In order to minimize the environmental impacts of snow and ice control, the city uses alternative deicing and traction materials. City water quality staff has reviewed and analyzed the materials and found no significant impact to Boulder's water sources or distribution system. No sand is used unless alternative deicing materials are not available from the supplier and public safety is an issue.

The liquid deicer is a magnesium chloride solution, a plant nutrient and soil stabilizer that is less corrosive than other deicing products. In 2008, the city switched to a more effective and environmentally friendly formulation of magnesium chloride called “Meltdown Apex.” Meltdown Apex, which costs slightly more than traditional magnesium chloride, is more readily available from the supplier and continues to be effective at lower temperatures. Staff continues to analyze new and less-corrosive liquid deicers.

The granular material called “Ice-Slicer,” used as a crystallized deicer, is made up of complex chlorides that dissolve over time and do not need to be swept. However, in keeping with the city’s commitment to air quality goals monitored by the Regional Air Quality Council (RAQC), staff attempts to sweep all snow routes within four days of a storm event or as routes are cleared with bare pavement, whichever comes first.

Depending on weather conditions, streets are sometimes pretreated with liquid deicer before a storm to help reduce the buildup of snow and ice. The material or combination of materials used depends on existing and predicted weather conditions (i.e., the amount of precipitation and humidity) and pavement temperatures.

Standard operating procedures also provide for the proactive application of deicing materials on streets that have certain characteristics (such as steep slopes and significant shading) that contribute to more challenging conditions and typically generate a high number of resident requests for attention. Utilizing data collected from past service requests, this “spot plowing and treating” approach will occur at locations with significant elevation gain/loss and/or solar shading.

Before and during the snow season, the city evaluates and restores its supplies of deicing and traction materials. As meteorologists are expecting a [“strong” El Nino](#) that could lead to a harsh winter, the department is stockpiling extra IceSlicer now, while it is being sold at a cheaper rate. Instead of the annual 2,000 to 2,500 tons ordered each season, the department has ordered 3,000 tons and has identified the necessary storage space to hold the extra material. In previous years, it has sometimes proven difficult to obtain sufficient quantities because of the often unpredictable deliveries from Utah and competition for materials with other Front Range cities. Since the materials can be easily stored and used in the future, it is possible that any extra materials will keep over winter and be available for the 2016-2017, so this is a prudent investment.

Operational Efficiencies and a Comprehensive Third-Party Review

The Public Works Department continues to investigate potential tactics to optimize the efficiency of snow and ice removal operations. Advancements in technology and operational strategies have significantly enhanced the available methods of performing snow removal activities. The Public Works Department intends to use the latest technology and organizational systems to:

- Enhance service delivery;
- Strategically allocate and maximize existing resources;
- Reduce costs and/or increase the scope of service;
- Eliminate redundancies; and

- Meet the community's needs and expectations for snow removal services.

The department is currently conducting an evaluation of critical activities related to winter maintenance and operations, which includes a comprehensive third-party review of the Snow and Ice Control Program that will extend through the 2015-2016 snow season. The intent of this project is to advance the city's mission of meeting the Boulder community's need for cost-effective and efficient delivery of public services.

The comprehensive third-party review of the Snow and Ice Control Program will include two phases. Phase 1 is an evaluation process for identifying needs and giving the leadership team recommendations for improvements. Phase 2 will include implementation of the tasks identified in Phase 1 that city leadership recommends to move forward. Tasks that would require increased work to complete would also be part of Phase 2. The project is constructed in a modular fashion to facilitate customized modules in both phases.

The consultant and city staff has identified potential opportunities for short-term improvements during the early stages of the third-party review. These include operational and staffing efficiency improvements that will be fully or partially implemented as part of the 2015-2016 snow season, with no additional cost in labor, equipment or materials.

So far, the third-party review of the Snow and Ice Control Program has produced the following initial findings that will be either fully or partially implemented during this snow season.

1. Phases I and II of the Living Lab program are included in the scope of the third-party review. At this time, both the Folsom Street and University Avenue Living Labs are actively being analyzed. Based on initial review, staff has already identified a new approach for snow removal operations along the Folsom Street Living Lab, which is described in detail below.
2. Beginning this season staff will monitor more closely the volume of deicing materials used by requiring more routine calibration of spreader equipment and by increasing quality control/oversight of material usage and application techniques. The review has identified quality control issues as well as, in some cases, over use of materials. Future snow season operations will also focus on testing less expensive and equally effective substitutes using more accurate and real-time metrics reporting.
3. Enhanced reporting will use current information to guide performance for snow removal operations. Metrics will include input, output, and outcome measures for process control and level of service continuity across the city.
4. Immediate adjustments to staffing assignments and snow shift scheduling will result in a more proactive response to winter weather events and allow for more predictable schedules and an improved work/life balance for the plow operators.
5. The review is currently analyzing snow routes for optimal routing using GIS and applied routing technology. Initial findings have identified an imbalance in some snow routes which will be corrected in time for the upcoming snow season. Other findings will be applied later in this snow season as they are identified and encountered through the review.
6. Incorporating recent technical innovations into the city's vehicle fleet will reduce the number of fixed assets by using combination bodies instead of both trucks and spreaders. This change

will create a safer work environment, reduce equipment and maintenance, lower capital costs and require less effort to change from snow removal to traditional work.

By the end of the 2015-2016 snow season, the comprehensive third-party review of the Snow and Ice Control Program will document and identify additional long-term improvements for further analysis and discussion.

Living Lab Projects and Reconfigured Streets

The city has implemented multiple Living Lab projects within the city that affect snow removal operations. The most significant is the Folsom Street Living Lab, which involves the reconfiguration of lanes and intersections. Public Works staff will ensure that these Living Lab streets and bicycle lanes are kept clear of snow and ice. City staff also has consulted with other cities who are piloting similar street projects.

The third-party review is also addressing operations and equipment alternatives for the Living Lab projects and any changed or unique uses of city streets and paths. The preliminary operation plan drafted with the consulting firm calls for continuing normal operations along the vehicle lanes, with two of the department's larger plow trucks servicing the street. Snow within the vehicle lanes will be plowed to the center turn lane along Folsom Street. This may create temporary snow buildups in the center turning lane (known as windrows), which will be promptly removed once they reach a height of approximately two feet. The city currently uses this plowing and hauling method for other streets in Boulder.

The windrowed snow in the center turning lane along Folsom Street will only remain for brief periods while removal and hauling commences. As a back up to city resources, local contractors could be utilized for snow hauling. Four extra dump trucks will be on reserve through contracting for loading and hauling of windrowed snow.

Snow removal between the vehicle lane and curb will involve a separate operation with different equipment. The bicycle lanes along the Folsom Street and University Avenue Living Labs will be cleared using smaller equipment that the city already owns, including: a "Gator" all-terrain vehicle equipped with a plow; Ford Ranger pickup trucks equipped with plows and deicing tanks; small loaders equipped with plows; and snow blowers.

Snow will generally be plowed into the landscaped zones along Folsom Street, along with other right-of-way spaces that staff has identified for additional snow storage. Occasional removal of bollards may be necessary to help fit the snow removal equipment into the bike lanes. Smaller equipment will be used to drag snow from between bollards towards the curb. Sidewalk crews will continue maintaining sidewalks that front city managed properties or other public ROW spaces along Folsom Street, and with a heightened focus on accumulated snow needing removal.

Transit Shelters

Transit shelter maintenance continues to be a challenge for the city and the Regional Transportation District (RTD). With nearly 1,000 transit stops located within Boulder, the city and RTD are only able to provide regular maintenance at high-use transit stops to the extent that human and financial resources permit. Snow removal is performed at the remaining RTD transit

stops on a limited basis by city staff or contractors, typically by request only. RTD's Adopt-a-Stop program utilizes community volunteers to remove trash and snow from designated stops.

Weather-related Decisions About City Facilities and Programs

When an incoming severe weather event is forecasted that could affect the transportation system, the Public Works Department follows a standard operating procedure that guides communication with the City Manager's Office and assists with decision-making regarding city facilities and programming. Transportation Maintenance staff analyzes forecasting and other real-time informational tools, assesses local roads, and investigates the response of other agencies, including the University of Colorado Boulder, Boulder Valley School District, CDOT, the Boulder County Office of Emergency Management, and other nearby cities. Transportation Maintenance management collects and analyzes all information and provides an informed recommendation to the Executive Director of Public Works about the appropriate response and action. A recommendation could include delaying the opening of city facilities, early release of city functions, or postponing public meetings and events. The City Manager's Office consults with the Executive Director of Public Works and makes the decision to alter city functions or facility hours.

SIDEWALK SNOW REMOVAL ENFORCEMENT

Section 8-2-3, B.R.C., 1981 requires that sidewalks adjacent to both residential and commercial properties be cleared of snow and ice no later than 24 hours after a snowfall or snowdrift. Property owners, tenants and property managers can each be held responsible for failure to remove snow. Violation of the ordinance can result in a municipal court summons and fine (\$100 for first offense) or abatement, in which the city hires a contractor to clear the sidewalk at the property owner's expense. Enforcement of the sidewalk snow removal ordinance is handled by the Code Enforcement Unit in the Boulder Police Department. Code Enforcement is available seven days a week from 7 a.m. through 5 p.m. Code Officers schedules will be adjusted during the snow season as needed to fully respond to snow events.

The National Weather Service website, www.nws.noaa.gov/data/obhistory/KBDU.html, is the official resource monitored for local weather conditions. The information is updated every 20 minutes. To learn when the 24-hour time period begins, community members can go to the website and look for the "Weather" column and corresponding time. The descriptions in the weather column will include "Overcast," "Fair," "Mostly Cloudy," "Light Snow," "Snow," etc. Code Enforcement may begin enforcing the snow removal ordinance 24 hours after the last mention of snow listed on this website. Residents may also check Inquire Boulder or call the code enforcement line at 303-441-1875 to learn the official time that snowfall stopped. During times of consecutive storms, the original stop of snowfall will be enforced when no apparent effort is made to keep the sidewalks cleared for safe passage.

When a Code Enforcement Officer identifies a violation of sidewalk snow removal, the officer attempts to make contact at that location to have the snow removed. If no contact can be made, a 24-hour notice of violation is posted on the front door of the property in violation. Only one notice per snow season will be issued to a property. A notice will also be mailed to the owner of record per the Boulder County Assessor's office and to any agent listed on the properties rental

license. After the expiration of the notice, an officer will re-inspect the property to confirm compliance. Should a property remain in violation and for repeat offences, the address will be added to a list that is forwarded daily to a contractor for abatement of the hazardous condition. The property owner is then billed for all snow removal charges and assessed an administrative fee.

Parking Service Officers will be posting courtesy notices to snow violations within their 10 assigned Neighborhood Parking Permit zones while conducting parking patrols. These notices will increase the ability of the city to contact properties that have not shoveled and encourage voluntary compliance for the remainder of the snow season. Properties that fail to shovel will be reported to code enforcement for further enforcement.

The Code Enforcement Unit will continue to partner with the University of Colorado Off-Campus Housing and Neighborhood Relations department, as well as other community and neighborhood groups, for an educational campaign that will focus on the importance to “Make it Clear.”

Education will focus on:

- increasing community awareness of each person’s role in ensuring that sidewalks are cleared and safely passable after snow events;
- the requirements of the sidewalk snow and ice removal ordinance; and
- the liability should a violation remain on private property.

Education will be in the form of detailed pamphlets being delivered door-to-door in identified areas that have a high volume of new residents each season and a history of repeat violations. Information will also be available on the city website and through outreach to local media sources. “Make it Clear” will also direct people to resources for snow removal assistance and to volunteer opportunities to assist others in the community.

Additional code enforcement information can be found on www.inquireboulder.com under “Code Enforcement Unit,” which includes a link to the National Weather Service report for Boulder.

NEXT STEPS

The comprehensive third-party review of the Snow and Ice Control Program will continue throughout the 2015-2016 snow season. Based on city leadership’s direction, Phase 1 recommendations for improvements will be implemented during Phase 2, along with long-term improvements that will require more work to complete.

The short-term improvements to operations and staffing that were identified during the early stages of the third-party review will be fully or partially implemented as part of the 2015-2016 snow season, with no additional cost in labor, equipment or materials.

For more information about the Snow and Ice Control Program, please contact Gregory Izzo at izzog@bouldercolorado.gov or 303-413-7160.

For more information about the transportation planning effort regarding bus shelter maintenance and the Living Lab Program, please contact Kathleen Bracke at brackek@bouldercolorado.gov at 303-441-4155.

For more information about code enforcement efforts, please contact Jennifer Riley at rileyj@bouldercolorado.gov or 303-441-1877.