



City of Cambridge

Executive Department

YI-AN HUANG
City Manager

CMA 2025 #60
IN CITY COUNCIL
March 24, 2025

To the Honorable, the City Council:

Please find attached response to AR 25-14 which requested a report on snow operations with a focus on crosswalks and pedestrian islands.

Very truly yours,

Yi-An Huang
City Manager





City of Cambridge

Executive Department

YI-AN HUANG
City Manager

March 18, 2024

To the Honorable City Council:

In response to AR 25-14 requesting a report on snow operations with a focus on crosswalks and pedestrian islands, the Department of Public Works submit the following report summarizing the City's current operations, as well as opportunities for continued improvements.

Summary

The Department of Public Works leads snow and ice operations for the City, but many other departments are involved in the operation, including the Water Department, Department of Transportation, Human Services Department, and School Department. In addition to those departments involved in direct operations, there is close coordination with the City Manager's Office, Emergency Communications, Inspectional Services Department, Fire Department and Police Department throughout storm events. Another important partner in this work is the Commission for Persons with Disabilities Commission. DPW staff meet annually with the Commission to review operations, answer questions and gather feedback on ways to continue to improve / expand snow operations.

The goal of snow operations is to keep the city operational, support emergency response, and provide safe travel for our community. Over the last 15+ years the program has matured and uses technology to improve efficiency, a wider variety of equipment to support our changing public right-of-way, brine (a liquid that can be placed on surfaces in advance of storms as a deicer and reduces the use of more traditional road salt), and increased outreach efforts to inform residents and businesses, including the revamped snow center at www.cambridgema.gov/snow#snowresources. The snow center is a central location for information about snow operations, parking bans, school closures, etc.



As the program has grown, there has been an increased emphasis on clearance for both bicycle and pedestrian facilities. And while DPW does not clear all sidewalks in the city, they do clear over 30 miles of sidewalks and also enforce city ordinances associated with sidewalk clearance.

Background to winter storm response

Storm forecasting

The City contracts with two metrological companies who provide detailed temporal and spatial forecasts for the City throughout the year. DPW staff are in contact with these services on a continuous basis before, during and after snow storms so that our response is properly calibrated

to the nature of the storm. This coordination allows DPW to better anticipate the crew sizes and starting times, the numbers and types of contracting equipment that will be utilized, whether a snow emergency will be called, and helps inform the School Department, as they evaluate delays in school openings or cancellations.

While forecasting has become much more accurate in the last decade, there continues to be times when forecasts shift, leading to more or less snow than anticipated. Storms can also have significant variability in snow totals over small areas, making it challenging to get an accurate and consistent forecast.

Cambridge	Hometown Forecast Services
Attention: John Nardone/TJ Shea	Nashua, NH
Fax: 1-617-349-4868	Phone: 1-603-204-5430
Forecast prepared: Tuesday, January 28, 2025	Fax 1 603 204 5437
Meteorologist: Joel Burgio	

Forecast Discussion

An active weather pattern is shaping up for much of the week. Clouds stream in tonight as a cold front approaches the region. This front may produce a few snow showers or squalls Tuesday morning with less than 1/2 inch of accumulation, then temperatures start dropping during the afternoon behind the front. Clouds quickly return Tuesday night ahead of Alberta Clipper. That system will bring in some light snow Wednesday morning, with snow showers possible in the afternoon. Snowfall 1/2 to 1 1/2 inches of accumulation is possible. High pressure brings sunshine and colder weather in for Thursday, then another system moves in on Friday with some rain developing. Sunny and cold again Saturday. Forecast updated 1:30 am.

Tuesday, Jan 28	Conditions	Temperature	Wind	Gusts	Precipitation
12 AM - 3 AM	Mostly cloudy	33	SW 10-15		
3 AM - 6 AM	Cloudy	30	SW 10-15		Trc.
6 AM - 9 AM	Snow showers	31	SW 10-15		Dusting
9 AM - 12 PM	Snow showers, maybe a squall?	34	NW 20-25	35	<1/8"
12 PM - 3 PM	Partly sunny	26	NW 20-25	40	
3 PM - 6 PM	Mostly sunny	22	NW 10-15	20	
6 PM - 9 PM	Clear	21	W 10-15		
9 PM - 12 AM	Partly cloudy	22	W 5		

Forecast Comments: Snow showers or a brief snow squall in the morning. Snow may reach 1/2" if snow squalls are active in the area. Windy and colder in the afternoon.

Daily Maximum Temperature: 34

Daily Minimum Temperature: 22

Wednesday, Jan 29	Conditions	Temperature	Wind	Gusts	Precipitation
12 AM - 3 AM	Cloudy, snow showers	21	SW 5		<1/8"
3 AM - 6 AM	Light snow	21	S 5		1/2-1"
6 AM - 9 AM	Light snow	25	L/V		1/4-1/2"
9 AM - 12 PM	Light snow	32	S 5		<1/2"
12 PM - 3 PM	Light snow/rain	37	NW 5-10		Nil
3 PM - 6 PM	Cloudy, snow showers	33	NW 5-10		<1/8"
6 PM - 9 PM	Cloudy, snow showers	29	W 5-10		Trace
9 PM - 12 AM	Partly cloudy	24	NW 5-10		

Forecast Comments: Light snow in the morning, snow showers in the afternoon. Snowfall 1/2-1 1/2 inches, Rain may mix in briefly in the early afternoon.

Daily Maximum Temperature: 37

Daily Minimum Temperature: 21

Example of forecasts provided to the City by Hometown Forecast Service 01/28/25.

Use of Technology

DPW has implemented new software and hardware technology to improve the process for calling in staff, deploying equipment and tracking equipment throughout storms. During storms, DPW uses GPS technology to ensure full route coverage by drivers and route optimization. DPW also uses pavement temperature and moisture sensors together with more advanced weather station microclimate indicators to better ensure an optimum response to storm events as they emerge.

Snow plowing

During medium snow storms (generally 3" to 6"), DPW together with the Water Department and the Department of Transportation, typically deploy 50 to 80 pieces of equipment and have mechanics, supervisors and management staff to assist in ensuring the operations run smoothly.

During larger storms (generally 6" or greater), the City typically supplements the operation with contractors providing an additional 90 or more pieces of equipment. However, over the last number of years, it has become more challenging to attract contractors into the city given the uncertainty associated with winter weather, the challenging nature of snow plowing, the low unemployment numbers statewide and competition from other entities for the same equipment. When DPW uses contractors, they carefully evaluate when and how many

contractors should be brought in to help manage the storm, while also being good financial stewards of city finances.

Snow Removal

DPW does not typically remove snow during storm events, as it is a costly operation and there are limited locations to store snow. However, during larger events (typically more than 6”) or back-to-back events, DPW will evaluate organizing a “bus stop operation”, which includes high priority bus stops, adjacent sidewalks, and adjacent crosswalks. And in some larger events, more extensive snow removal may be required in order to keep our streets operational.



Throughout storm events staff from DPW, Department of Transportation, School Department and Fire Department assess and address access issues for MBTA and school buses on streets where widths have been constrained by windrows. This issue is one that can also exist in business districts where making deliveries becomes much more challenging. This becomes even more important when one snow event follows immediately after another.

These bus stop and snow removal operations are major multi-evening events and can have significant costs. The equipment used for snow removal is substantially larger and more costly to operate than the equipment associated with snow plowing. Depending on the storm, it can take two to four nights with an average contractor cost of \$200,000 / night and may extend even further depending on the size of the storm.

One of the significant constraints of snow removal is where to physically put the snow.

Snow Storage

The City has very limited space to use for snow that is removed from the public way. Typically, the City hauls snow to the large parking lot on the west side of Danehy Park on New Street. In previous years, DPW was able to use space at the corner of Binney Street and Fulkerson Street, before it was transformed into the park. DPW also coordinates with Harvard and have been able to use one of the larger Harvard University properties in Allston. However, this area is likely to be redeveloped at some point in the future.

In addition to space concerns, once snow is removed to Danehy or other locations, this snow must then be managed to ensure there is adequate space for the next storm and to make sure, in the case of Danehy Park, that late season storms don't overly constrain parking when spring sports begin.

Sidewalk Clearance – City Operations and Property Owner Responsibilities

The City clears snow from approximately **30 miles of sidewalk, 10%** of all city sidewalks. These areas include sidewalks adjacent to city parks, buildings, schools, and the **Snow Exemption Program**, whereby an income eligible homeowner who is elderly or has a disability, can qualify to have the City shovel their sidewalk. While the number of properties participating in the program fluctuate year to year, on **average 70-100 properties** are serviced by this program. Residents can determine their eligibility by contacting the Cambridge Council on Aging @ 617-349-6220 and learn more about the program at www.cambridgema.gov/snow#snowresources



Sidewalk clearance is done by hand crews, walk-behind snow blowers and sit-on sidewalk plows and salting equipment, depending on the location and the width of the sidewalk. Sidewalk clearance is typically a very labor intensive operation.

Below is a slide depicting the areas cleared by City crews during significant storms.







Public Transportation Accessibility

Bus Stops/Ramps

- Cambridge Street
- Massachusetts Avenue
- Concord Avenue
- Mount Auburn Street
- Western Avenue
- River Street
- Huron Avenue
- Rindge Avenue
- Broadway
- Prospect Street
- Pearl Street
- Brookline Street
- Green Street
- Granite Street
- Aberdeen Ave
- Magazine Street
- Putnam Ave – Western to Brookline
- Bigelow Street
- Inman Street
- Webster Street
- Windsor Street
- Garden Street
- Main Street
- Kirkland Street
- Quincy Street
- Columbia Street
- Hampshire Street



Pedestrian Operations

-  30+ miles of City-Cleared Sidewalks/ Curb Ramps
-  Abutting schools, public buildings, public open space
-  City-owned parking lots and garages
-  Residential exemption program

One of the issues that was identified this year as being **problematic for pedestrian access** was crossing islands and **extensive windrows associated with separated bike lanes at crosswalks**. DPW will be **adjusting our direction** to operators clearing separated bike lanes to ensure they are opening up **crossing islands** and addressing **significant windrows adjacent to separated bike lanes at crosswalks**.

By city ordinance, **property owners** are responsible for **removing snow** from sidewalks next to their properties within 12 hours of snow stopping during the daytime, and before 1 PM when the snow has fallen during the night. **Ice** on sidewalks needs to be addressed by property owners within 6 hours of its formation.

City staff inform residents of their responsibilities during snow events through the City’s Snow Center, social media and other communication avenues, with the goal of improving the overall winter conditions for people walking. DPW also prioritizes enforcement of the ordinance requirements; using compliance officers and engineers to inspect sidewalks and issue tickets. Ticket numbers vary widely year to year depending on the number of snow, ice and salting events that occur and the various nature of each storm. Over the last decade of increased education and enforcement, there has been a significant improvement in the level of sidewalk clearance, but we continue to prioritize these efforts.



Ticketing/Fines

Snow Season	# of Citations Issued
2016-2017	546
2017-2018	166
2018-2019	210
2019-2020	326
2020-2021	223
2021-2022	274
2022-2023	83
2023-2024	188
2024-2025	578
Total:	1828

Snow Season	# of Complaints Received
2016-2017	1068
2017-2018	933
2018-2019	591
2019-2020	695
2020-2021	758
2021-2022	970
2022-2023	223
2023-2024	403
2024-2025	1270
Total:	6911

Payments made on tickets within 6 months of issuance is approximately 50%

Maintaining Cycling Facilities

Beginning in the early 2000’s, DPW began snow clearing on our newly constructed raised cycle tracks. With the implementation of more separated cycling facilities, and the adoption of the Cycle Safety Ordinance in 2020, this bike infrastructure and its maintenance have expanded significantly. This has required the purchase of additional small equipment and staff training. The goal is to make these facilities as safe as possible as soon as possible after winter storm events.



As these new raised cycle tracks and separated bike lanes have come on line, it has increased the demands on the snow program and managing expectations is challenging, most particularly given the expectations specific to dry underfoot conditions.

Data Associated with Snow Totals and Costs

The above paragraphs provide some details about the City’s snow operations including the use of new technology and the challenges the City faces during winter events. The issues are compounded by the challenging private contractor environment, the lack of snow storage and the evidence of more extreme (and unpredictable) weather.

The numbers shown in the adjacent graphs are a small sample of snow totals and snow costs per year, over the last ten years. While snow totals in and of themselves are not fully representative of overall winter weather conditions, these graphs and numbers provide a snapshot of the investment the city is continuing make in our winter weather management.

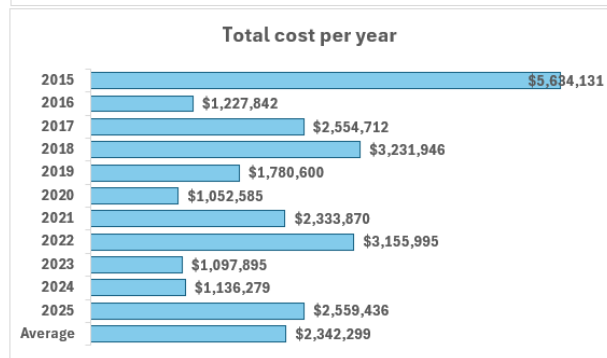
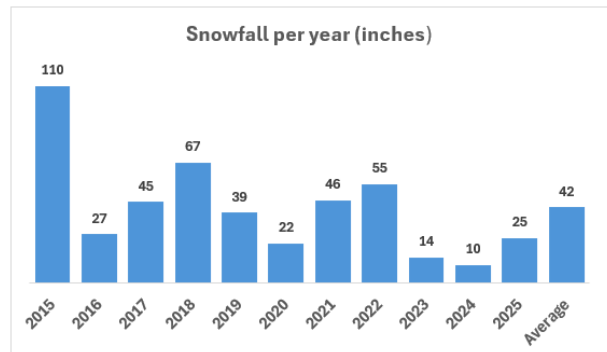
Conclusion

As noted above, while winter operations continue to be challenging to manage, staff are committed to maintaining facilities year round. This requires both public and private commitment to snow and ice clearance.

With some of our newer roadway alignments, that have allowed for much safer access by all modes of transportation, we realize that there are challenges to our maintenance operations that need to be evaluated, and that both

residents and businesses need to understand their responsibilities as these city landscapes change.

Public Works will continue prioritizing outreach efforts and operational improvements, including specifically **prioritizing crossing islands and extensive windrows associated with separated bike lanes at crosswalks.**



5 Year Periods	Average spent on snow per inch
2015-2019	\$50,101.50
2016-2020	\$49,238.43
2017-2021	\$50,016.95
2018-2022	\$50,458.50
2019-2023	\$53,528.10
2020-2024	\$59,704.93
2021-2025	\$68,556.50

Very truly yours,

A handwritten signature in black ink, appearing to read "Yi-An Huang". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Yi-An Huang
City Manager