



Thomas R. Bellegarde  
*Interim Assistant City Manager/Public Works Commissioner*

To: Kevin J. Murphy, City Manager

From: Thomas R. Bellegarde, Assistant City Manager/Public Works Commissioner

Date: November 1, 2017

RE: Council Motion of 10.4 10/24/17 C. Leary

***Req. City Manager Provide A Report Regarding DPW Usage Of Chemical Application When Treating The Road Before, During And After Storms; Report Should Include The Costs Associated With Implementation And Recommendations For Cost Savings***

The City of Lowell Department of Public Works Streets Division is responsible for the coordination of the winter operations throughout the City. The winter fleet uses dry sodium chloride (rock salt) when pre-treating and fighting frozen precipitation. We have, and continue to research the latest technology to pre-treat roads as a cost savings measure. However, the utilization of liquid materials and chemicals require significant capital investment to provide questionable return on investment. As an example, the DPW researched the purchase and implementation of brine making machine as well as testing liquid ice melt. Due to the minimal use and limited success of the liquid chemicals, it was very difficult to compare costs and to calculate any savings. The brine machine would have included the need for a heated building, pumps and storage tanks, application equipment to install on the fleet, and the certification of a "brew master". Costs neared \$1M for the full investment. Further investigation showed that the best use is for long stretches of high speed highways and not for residential streets. It was also concluded that the equipment required more frequent service and extended downtimes. Preliminary materials used by the city were extremely viscous and clogged easily, also requiring frequent service. The other consideration is that the materials are ever changing, and have not been proven over time.

Five years ago, Lowell was one of the first cities to invest in a programmable system (Cirus), which controls the amount and speed of the distribution of the rock salt. It was also equipped with a GPS tracking of where, when and how much material was delivered. This allows the Supervisor to determine the ratio of material and speed of delivery. The Street Division Head uses information from DOT studies to obtain the desired ratios in order to minimize waste. Factors that contribute to the amounts used to treat the roads include precipitation type, air temperature, road temperature, time of day, expected event length, and forecasted post storm conditions. The Cirus system is now required in numerous New England cities and towns and includes Massachusetts DOT vehicles and contractors. The City of Lowell requires all contractors that spread salt to install their vehicles with the Cirus system as a part of their contract.

Salt purchases over the past few years were \$1.1M in FY17, \$400k in FY16 (the City did not restock the salt supply at the end of the winter season in a change to historic practices), \$750k in FY15, and \$720k in FY14.



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As previously mentioned, alternative materials may not provide tangible savings and results to the City and our snow operations. Alternatively, costs are contingent on the acceptable standards/results demanded for the safe passage of the streets. Curb to curb and dry/black pavement requires more time and material than minimum treatments. However, we do not want to jeopardize safety as part of cost savings.

Our entire fleet has been outfitted with the Cirus distribution system at a cost of approximately \$6,000 per vehicle. Since the City of Lowell was one of the first major cities to invest in one of these systems, the opportunity to save would come at the end of the useful life of the current equipment. Newer versions and alternatives are more efficient and require less maintenance. The biggest cost savings could occur by expanding on our remote storage/loading stations and investing in the necessary repairs to our storage shed located at the landfill. Creating larger and covered storage areas at locations like the Wastewater, Water, Parks and Cemetery properties would allow for less drive distances and quicker reload times during the crucial part of the operations. Ultimately, it would reduce the time required to treat our roadways. Lastly, cost savings could be realized by purchasing salt during discount periods that occur outside peak seasons. Eastern Salt, our vendor as procured through Mass DOT, offers discount pricing during the summer months. We recommend restocking all locations during these discount periods.

Feel welcome to contact me with any further questions you may have on this matter.