Effective Resource Management - 2012

Improvement Status

The Bureau of Highway Maintenance for several years has been involved in a chloride reduction program along the I-93 corridor from Salem to Manchester and has tracked the salt usage and corresponding Winter Severity Index (WSI). Through the implementation of a number of initiatives, such as Maintenance Decision Support System (MDSS), ground speed control spreaders, prewet systems, and employee and hired truck operator training, the Interstate shed in Derry has been able to consistently reduce salt usage while maintaining the level of service currently experienced by motorists. Funding will be required to achieve this reduction due to the need to upgrade the current equipment. A reasonable reduction would be 2% yearly with a total maximum reduction of 20% over the long term. Without the required funding for equipment upgrades and training, this savings will be difficult if not impossible to achieve while maintaining the current level of service and the safety of the traveling public.

Based on the past 10 year's salt usage and a winter severity of -6.05, a usage of 111,806 tons of salt for FY 2012 was predicted. The actual usage for FY 2012 was 112,660 tons, (an excess from predicted of 854 tons (0.76%)). Given the sensitivity of the formula, this usage is statistically on target for the predicted versus actual usage. Though the target was met, the goal of a 2% reduction was not met. No additional funds were provided to improve winter operations, equipment upgrade and training to enable the reduction of salt use.

Protect and Enhance the Environment

Salt Usage (Five Year Moving Average)

Purpose:

New Hampshire's winter maintenance relies heavily on the use of salt (as Sodium Chloride) to achieve acceptable road conditions for the motorist. New Hampshire was the first state in the nation to begin using salt in their winter operations and the use of this material has spread nationwide as a common deicing chemical. There are two factors that impact the Department's desire to reduce the use of this chemical, those being material cost and environmental impact. Balancing the reduction of salt must also be no reduction in the level of service for the motorist. Winter roadway condition during a storm and following the storm impacts the safety of the motorist as well as the mobility of the public in general. A reduction in highway mobility will directly impact the economy of the state, especially when businesses are relying on "just in time" deliveries and the general populace has a greater level of mobility and associated expectation of the ease mobility provided.

The use of salt is directly correlated to the severity of the winter months each year. Due to the variances in the weather, the amount of salt (tons) used during a winter season can vary by as much as 100% between years. The New Hampshire Department of Transportation has used a Winter Severity Index (WSI) that was developed by Washington State University and published in the report NCHRP H-350. Although this measure is not a perfect correlation between usage and severity, it is believed to be sensitive enough to depict changes in salt usage. The first

graph below is the representation of the salt usage versus WSI for the last 10 years. The second graph calculates a formula from past usage that will be used to predict salt usage given a specific WSI. It is this theoretical value for salt usage that the actual usage will be compared against to calculate salt reduction each winter.

Data:

The Bureau of Highway Maintenance has historically collected the salt usage data during the winter months dating back to 1953. Salt data collection is made at the patrol shed level, currently utilizing the MATS system, and is then compiled to the district and statewide level. This collection typically begins on or around November 10 and continues weekly for 25 weeks or until approximately the end of April. WSI is calculated utilizing weather data, specifically the high/low temperatures and snowfall amount, all of which is readily available from a number of creditable sources (i.e.: airports). The calculation for WSI will be computed on a monthly basis for the months of November, December, January, February and March.

Salt Usage