

# battening down

*One way  
to deal with the  
unpredictable  
costs of winter  
weather.*

By Shane Belvin

**B**elieve it or not, snow and ice are right around the corner. The volatility of the past several winters, from mild temperatures to record snowfall, has complicated the already difficult task of budgeting during the winter months. This can directly affect the bottom line of both leased and owned parking facilities by keeping lots empty and increasing snow removal costs. For managed properties, it can stress margins and damage client relationships.

The uncertainty of weather ensures that the only thing definite about snow-related costs is that they will be unpredictable. You can analyze forecasts (what does El Niño mean?), read the *Farmers, Almanac*, use last year's expenditures as a placeholder, or just throw a dart at a board. A fixed, seasonal rate may help, but you still have risk in both high and low snow years. During seasons with below-average snowfall, you are paying for a service that isn't being provided. In high-snow seasons, some vendors might skimp on service to manage their own margins. These costs are independent of the weather's effect on customer behavior, which negatively affects revenue.

Tools exist that can mitigate this seasonal risk. Coupled with using vendor management and RFP best practices, these financial instruments can effectively cap a variable expense. This allows both tenants and parking service providers to better manage their costs, revenue, and capital structure. These financial tools utilize weather options or derivatives. Hedging your snow removal costs will allow you to cap your snow removal expenses without sacrificing service.



## How It Works

Weather options act in a similar way to insurance but differ in two key aspects:

- Unlike the long process of collecting on an insurance claim, you will receive payment 30 days from the end of the winter season.
- The payout is not determined by the costs you incur at your specific location. Instead, you are paid based on the amount of snow at an agreed-upon location. This eliminates the need for a long claims process and minimizes the administrative burden.

These products have been around for decades and have been widely adopted by the energy and agriculture sectors. Oil and gas companies can protect themselves against the negative effects of a warm winter, and utilities can save themselves from a decrease in electricity usage in cool summers. Agriculture can protect itself from instances of extreme temperature or precipitation.

Following is an overview of the weather derivatives market, a basic explanation of the product's mechanics, and some ways it may benefit the parking industry.

## History of Weather Derivatives

The weather market is rooted in the energy industry and began around the same time as deregulation in the U.S. Energy providers always knew that variability in the weather was probably the largest factor affecting energy consumption. However, these companies were able to absorb the ups and downs of the market because they were operating as monopolies. This provided great financial stability for the energy companies with minimal financial risk. At the time of deregulation, the various entities in the process of producing, marketing, and delivering energy to U.S. households and businesses were forced to confront weather as a significant risk to their bottom line.

The first participants in the market—energy traders such as Koch Industries and Aquila—created and executed the first weather derivative transactions in 1997. The first deals were all structured as protection

against warmer- or cooler-than-average weather in specific regions for the winter or summer seasons. The early market participants saw weather derivatives as an opportunity to hedge inherent weather exposure in their core assets and a new risk management product to offer to regional utilities.

The weather derivatives market has since expanded to the agriculture market and beyond. Bill Windle, managing director of Munich Re and long-time participant in the weather options market, has experienced this growth firsthand. He observes, “The weather derivatives industry has grown considerably in recent years. When I first started, we spent most of our time and effort helping those in the energy and agriculture industries mitigate the impact that weather had on their businesses. In recent years, we’ve helped everyone from real estate to municipalities manage their weather risk. I like to think that we are helping people take some of the worry out of their budgets.”

## Anatomy of a Weather Derivative

Weather derivatives exist primarily in the private or over-the-counter market. This just means the trades are not conducted on exchanges such as the New York Stock Exchange or the Chicago Mercantile Exchange. While the transactions are not completed on exchanges, they are still regulated by the National Futures Association and the Financial Industry Regulatory Authority. The transactions are executed with one-to-one agreements with the underwriter, or person taking the opposite position on the trade.

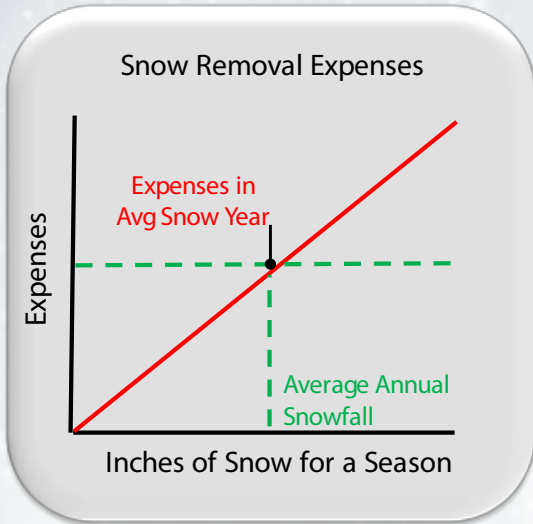
In the weather derivatives market, these underwriters are large, highly regulated, international insurance and reinsurance companies, such as Munich Re, Swiss Re, and Nephila Capital.

There are two primary references that need to be identified before using a weather option to manage your snow removal costs: quantifying the impact of an inch of snow for your location and identifying when you want the option to start paying you. Once that has been completed, determining the other components of the

**Table 1**

<b>Reference Weather Station</b>	All contracts are settled based on a measurement of weather at a particular weather station. These stations are operated and monitored by the NOAA, a third-party government entity.
<b>Index (Weather Statistic)</b>	This is the measure of the weather that will define the payout of the weather derivative contract. The statistic most applicable to snow removal is inches of snow at the closest weather station.
<b>Term (Timeframe)</b>	Contracts have a defined start and end date that define the period that the weather statistic is calculated. The most common term for winter season contracts is Nov. 1 through March 31.
<b>Strike (Trigger)</b>	A specific amount of snowfall is identified that determines the point that you would like the option to begin paying. Businesses will define this measurement based on risk appetite and strategy.
<b>Payout</b>	The contract will have a defined payment that mirrors the expenses that your locations endure as a result of snowfall. The payout will occur as a function of snowfall above or below the defined trigger.
<b>Premium</b>	The buyer of a weather option pays a premium to the seller that is typically 10 to 20 percent of the overall value of the contract. This may vary substantially depending on risk profile.
<b>Example Contract Structure</b>	An example of a trade to mitigate snow removal costs in Baltimore, Md., would be: payout of \$10,000 per inch of snow at BWI Airport for every inch above 20" between Nov. 1 and March 31.

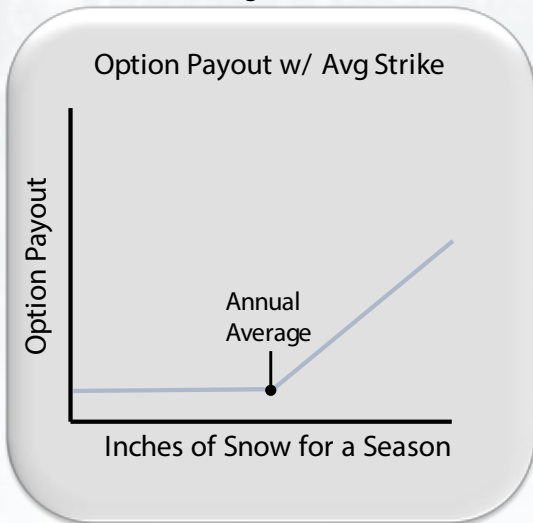
**Figure 1**



Snow removal expenses increase with snowfall and are highly variable on a year-to-year basis. The red line in Figure 1 represents the increase in snow removal costs as the seasonal snowfall rises. These expenses are usually recognized at the property level and can severely damage annual budgets.

To offset snow removal expenses in years with high snowfall, a call option is purchased. The blue line in Figure 2 represents the payout of the option as the snowfall total for the season increases. In this example, the option has a strike at the average snow amount and pays a pre-determined and increasing amount for every inch over that strike.

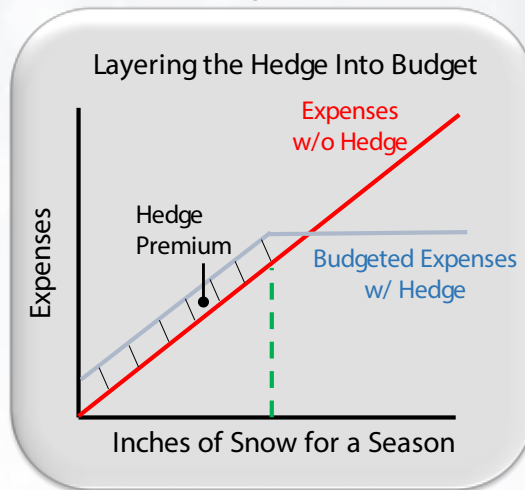
**Figure 2**



In Figure 3 the hedge payout and the increasing expenses are layered together. You can see that the cost of the hedge, or premium, creates a slight increase in expenses in low snow years. However, the payout offsets the above-average expenses when the option is in the money.

Figure 4 illustrates the resulting budget predictability as a result of the hedge. Expenses are capped at a predictable value that is slightly above the historical annual average. This cap still allows for positive budget

**Figure 3**



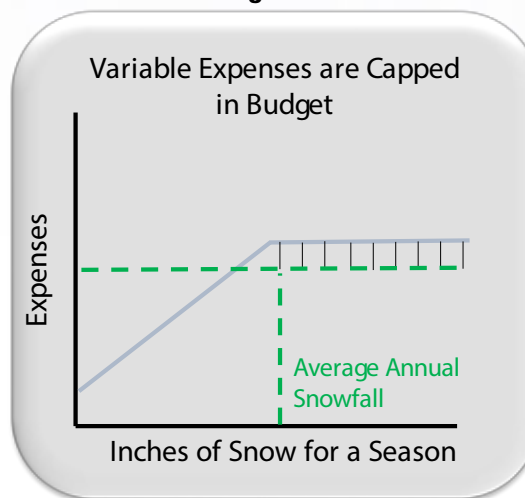
transaction (weather station, index, term, strike, payout, and premium) is relatively straightforward. Table 1 defines the factors required to enter a hedging agreement.

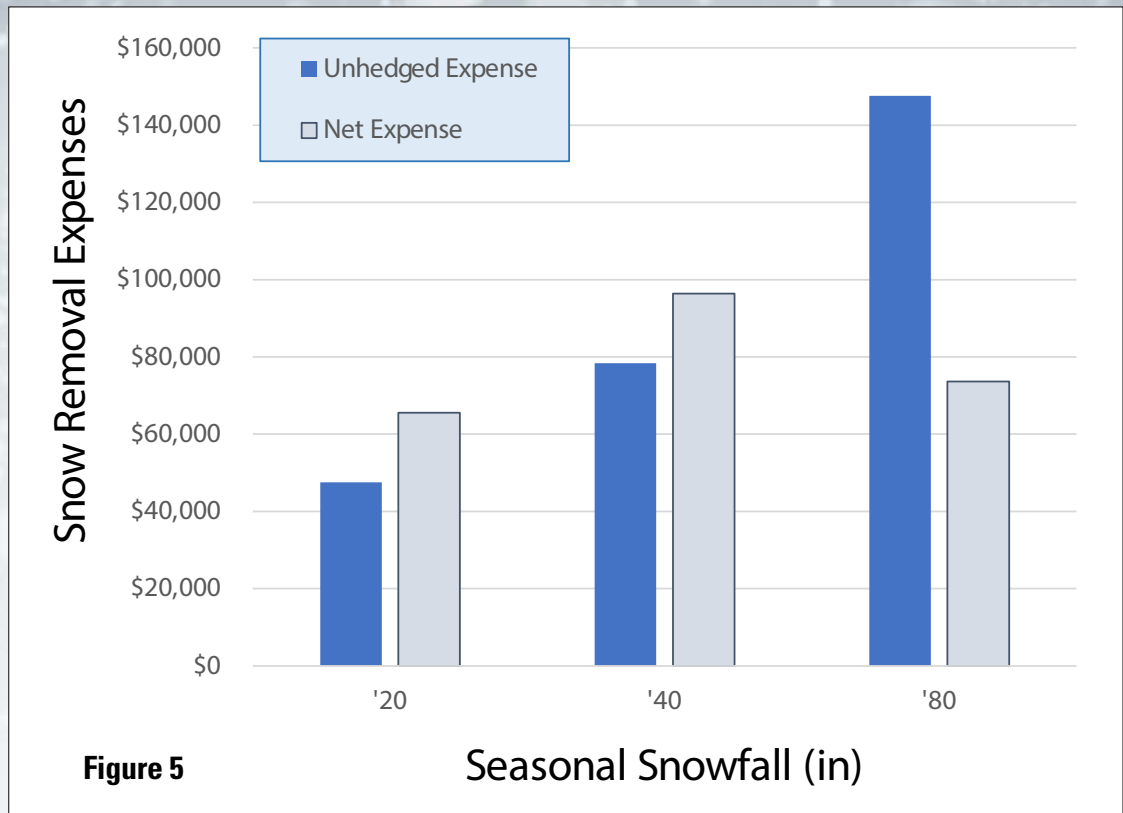
After the agreement is entered, the premium is paid to the underwriter. At the end of the agreed-upon term (in this example: March 31), if the snowfall for the identified weather station is above the strike amount, the option is considered “in the money.” This means that you will receive the payout that corresponds to the incremental amount identified in your contract. Using the sample contract from **Table 1**, the payout would be \$200,000 in the event that it snowed 40 inches at Baltimore/Washington International Thurgood Marshall Airport. (40 inches-20 inches = 20 inches; 20 inches x \$10,000 = \$200,000).

**Mechanics**

We will now walk through a step-by-step graphical illustration of the effect hedging against snowfall can have on your budget. For simplicity, we will address snow removal costs only, not lost revenue.

**Figure 4**





variances in low-snow years, allowing you to come in under budget while de-risking your parking portfolio.

### Case Study

Now that we have gone through the anatomy of a weather hedge, let's look at an actual example of weather options being used to manage snow removal expenses. This location is a class A office building located in Elgin, Ill. The average seasonal snowfall for the location is 40 inches, with an average snow removal expense of roughly \$80,000. The property manager, with the help of an adviser, chose a hedge that paid out \$2,500 per inch for every inch above 40 inches. The premium for this transaction was roughly \$18,000.

As you can see in **Figure 5**, the snow removal expenses in the average year are increased by the amount of the option premium. It is also worth noting that the net expense (the costs of snowplowing, plus the cost of the hedge, minus the option payout) ended up actually being less in the historically high, 80-inch, snow season.

### Possible Effects

Outside of budget certainty and cost savings, there are a number of additional benefits that can come from removing the volatility of weather. Many parking service providers choose to pass winter maintenance costs directly through to their clients. As clients continue to look toward bundled services, synthetically fixing snow removal costs may allow managers to add services to their scope of work without risking margins.

Additionally, any opportunity to help clients (owners, municipalities, investors) save money might lead to longer contract terms and stickier relationships. It can also allow vendors to remain profitable and provide quality service rather than losing money in high-snow years.

Lastly, we must think about how weather affects revenue, not just expenses. The examples used here have been largely applicable to parking lots. However, numerous locations have had their revenue affected by the rough winter of 2014-15 or the East Coast blizzard of 2016. Even if you are operating garage locations, you were likely affected if you operate around a leisure or tourist location.

As with all financial instruments, you must always ensure that you understand all the risks and benefits related to weather options. This overview hopes to provide those in the parking sector with information that may be useful in analyzing their weather-related financial risks and understand that there are products out there designed to mitigate those risks.

The information herein should not be construed or interpreted as recommending any investment in any particular product, instrument, or security and should not be relied on as the sole source of information upon which to base an investment decision. We recommend that you always do your homework to understand the needs and health of your business before deciding what financial programs are best for you.

As we look toward the 2016-17 winter, there might be a few tools out there that can help make the process a little less uncertain and a lot more bearable. **P**

**SHANE BELVIN** is managing director of Nobel Weather Associates. He can be reached at [shane@nobelweather.com](mailto:shane@nobelweather.com).