

## **How local weather forecast can save money in snow removal**

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### **ABSTRACT**

Andorra is a country with a lot of microclimates close to the Mediterranean Sea. The high altitude makes that the climate of the lower zones in Andorra riding between the rigor of high mountains and also the smoothness of the Mediterranean Sea. When there are heavy snowfalls in the lower areas of the valley, snow, ice and their effects on the roads are very different from how they behave on roads with cooler temperatures and uppers areas of the country. The fact that much of the population live in Andorra and drive by the valleys have more importance in case of heavy snow than in a higher and cold place. To be on the edge of the snow-rain level does that the performance of cleaning services is not always as effective as they want. Often snow melts on the road while we have heavy snowfall. To know the exact height of snow and the temperature at which precipitation will occur is the key to success of road maintenance services in this area of study. We present the case that relates to the Capital. Over time was observed that weather forecasts were not enough to determine if snow damage would be enough to cover the roads. Why? Due to multiple factors such as heat island, orientation and height of the roads. The problem was how to know when forecast prediction announces snow level at 1,000 meters for example and really we need to start effective cleaning. Many times snow falls but we don't need to clean it. The problem is to plan it and how. The first problem is that we can lose a lot of money every time that cleaning snow isn't well planned because we live on the level of the snow-rain. Economic losses are about thousand Euros in every winter season due to false alarms mobilizing snow. That is why we set up a different way of working. In the first stage, in collaboration with the Comú of Andorra la Vella, we study the problem of determining the snow level and which parts of the country could be more troublesome due to its orientation and height. Having studied this aspect, we monitor the temperatures on the road in conflictive spots. With early results are proceeded to draw a map where weather incidents could be worse for driving. The advice to the Comú was to determine for intensity of precipitation, ice, cold and if all of those elements could cause incidents on public roads. The final result was a savings of several thousand Euros thanks to our assistance in the snow.