



Three common winter weather decisions for airport operations

Bad weather wreaks havoc on the aviation industry year-round. However, winter weather's impact on airport operations, combined with the high-travel holiday season, coincide to create frequent, highly-visible disruptions. Snow, freezing rain, and slush are just a few of the winter conditions that create difficulties during take-offs and landings, as well as for low-altitude flights. The degree to which winter weather impacts operations is also dependent on how prepared an airport is to deal with it.



Making the right de-icing call

Ice is a main disrupter of winter flights. De-icing involves spraying an aircraft with a special fluid to remove ice from its wings. There are different fluids and treatments applied for different types of ice, such as snow, frost, or freezing rain. The challenge is to determine the type of ice and when to apply the treatment. Treat the wings too early, and they may ice again before the flight. Treat them too late, and delays are inevitable.

Schiphol Airport in the Netherlands turned to DTN to help its teams determine when to make the right call. Typically, the decision to de-ice an aircraft is based on the air temperature, but below-freezing air temperatures do not automatically mean that ice will form — or vice versa. [DTN Aircraft IceGuard](#) supports de-icing decisions by combining ground weather observations and forecasts with wing temperature observations and forecasts to calculate the ice type and quantity on the wing.

Precipitation, for example, can occur as dry snow, wet snow, or rain on the wing, but may change into water or ice depending on the wing's temperature. Because the model anticipates both the type of precipitation and its timing, it improves the team's ability to respond. That gives the airport enough time to ensure that sufficient labor and materials are available to de-ice aircraft.

Keeping runways clear

Successfully managing winter runway conditions is also a balance of treatment and timing. Failing to treat runways during adverse weather leads to unforeseen costs, damaged reputations, and even temporary closures. However, unnecessary runway treatments waste money and resources, as well as cause avoidable environmental damage.

Airports that rely on local forecasts may not have accurate precipitation estimates since the temperature is based on accumulation on ground, not airport pavement. Using hyper-local data that highlights the lowest runway surface temperatures with the type of precipitation, such as black ice or snow, is a better solution to support timely decisions. For the Ute Invernal Barajas in Madrid, DTN collected two years' worth of thermal mapping data measurements, in addition to historical data, to optimize the configuration of its [weather solution](#). These insights help airport operators make confident "treat or don't treat" decisions.



Coordinating weather response teams

Coordination of multiple processes and teams is necessary for effective winter weather responses in aviation. At Zürich Airport, the "Snow Committee" and de-icing coordination units control and monitor all processes related to winter operations and aircraft de-icing in close cooperation with a wide variety of partners, including handling agents, airlines, and the airport.

"Where possible, we have to adapt to unfavorable circumstances by making sure runways are cleared in time and airplanes are properly de-iced, without sending out the crews too soon," explained Veit Voges, FZAG project leader flight ops engineering. "Careful planning and anticipation are crucial. These activities not only cost money, but they also have substantial environmental impacts."

Voges said having one trusted weather partner was critical to coordinating efforts.

"When different teams and departments within FZAG used different sources for their weather information, coordinating action was really difficult," he explained. Now we have a single platform with a very good presentation, easy to read, and understandable for all users."

"In our operations center, there is a large screen continuously displaying the latest DTN weather information, including precipitation and lightning maps, all in a way that makes the most important information easily visible. It's a single source of accurate information that makes our winter operations smooth, efficient, and above all, safe," Voges said.

Caution: winter weather ahead

Preparing for and responding to any type of severe weather in aviation takes time, materials, and staff. Winter weather puts an additional burden on airport operations. The earlier airport operators know how many aircraft need to be de-iced and when, as well as which runways need to be treated, the more efficiently staff and resources can be deployed. Having the right operational intelligence will help airport operators make confident decisions about their winter weather responses.

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