



WINTER OPERATIONS

Within this section of the magazine, *Steve Maybee* from Edmonton International Airport highlights the challenges that the airport faces due to the **changeable Canadian weather**, *Mark Beveridge* from Aberdeen International Airport details how the airport managed to **remain open and operational** during a time when many airports were forced to close, and Montréal-Trudeau International Airport explains that it **never closes and rarely suspends its operations** despite receiving 220cm of snow

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On average, **Montréal-Trudeau International Airport** receives 220cm of snow every year, but never closes and rarely suspends its operations. The airport talks to *International Airport Review* about its rigorous winter operations.

Montréal-Trudeau International Airport's (YUL) snow removal team is responsible for clearing more than 1.9 million square metres of aprons, runways and taxiways - the equivalent of a 300km trip.

There is an average of 80 weather events each winter, and no two storms are identical. In total, this precipitation produces more than 600,000 metric tonnes of snow that must be loaded from the apron each year into huge trucks that are five times larger than normal sized dump trucks.

The team performs this task with military precision, using advanced technological tools, a modern fleet of snow removal equipment and highly

specific procedures to get the job done. Thanks to the expertise that has been developed over the years and an efficient system, the average snow removal time per runway takes less than 22 minutes.

The process begins with an analysis of weather forecasts, as early as 24 hours before the planned event. Additional validations are made on a recurring basis because weather conditions can change rapidly. Of course, this is not an exact science, so the magnitude of precipitation can sometimes be under or over-estimated. This is where experience and instinct come into play.

Snow removal crews are called to work depending on the anticipated severity of the

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OTLIGHT ON ADM E MONTRÉAL'S SNOW REMOVAL

weather event. YUL's high-precision winter operations then swing into action. They are controlled from a high-tech 'snow station' that benefits from a good overview of airport operations and is equipped with winter operations software for call management and data handling.

As soon as snow appears on the runways, the equipment is deployed. Braking tests are performed as soon as a runway is cleared to ensure that the surfaces are not contaminated, and that grip is at its maximum. ADM Aéroports de Montréal (ADM), the airport authority that manages YUL's operations, uses the latest Global Positioning System (GPS) and Geographic Information System (GIS) systems to collect real-time data on friction, temperature and runway condition. The data is then transmitted to all stakeholders, including air navigation service provider (ANSP) NAV CANADA, which provides it to airline pilots for take-off and landing.

A renewed fleet

To maintain the highest operational standards, ADM invested more than \$6 million three years ago to renew the bulk of the heavy equipment fleet that it uses for the winter maintenance of the runways and manoeuvring areas at YUL. It also purchased new equipment.

Longer and more frequent periods of icy conditions, and the increase in areas to be maintained, led ADM to add more spreader trucks to its fleet of maintenance vehicles and to acquire additional equipment, including an oversized loader, front-end loaders and five new state-of-the-art brush ploughs.

These new acquisitions have made it possible to reduce intervention time and, thus, minimise the impact of precipitation on operations. The maintenance teams are now better equipped to do their job and, thus, meet the needs of passengers and air carriers operating at YUL. ➤

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Montréal-Trudeau's track record is the envy of snow-bound airports around the world. An average 220cm of the white stuff fall on the airport site every year, more than any other airport in North America



During a winter precipitation episode, the snow removal fleet is deployed according to a clear set of priorities based on the operational requirements of Montréal-Trudeau's three main business sectors: domestic, transborder (Canada/United States) and international. The airport's two main runways are cleaned on an alternating basis to ensure optimal fluidity. If the snowfall is very heavy, the cleaning is done on a continuous basis. The type of snow (granular, wet, sticky, etc.) or freezing rain conditions are constantly monitored, since they can affect the manoeuvres required and the type of de-icer used, such as liquid potassium acetate (freezing rain) or sodium formate (snow).

The 2020-2021 winter season is a special case, due to the limited number of air movements that will take place as a result of restrictions implemented to control the spread of COVID-19. While ADM could have chosen to limit its operations to one runway at YUL during the cold season to significantly save costs, it decided to keep both runways operational to maintain a level of reliability and safety on these highly unpredictable days.

Recognised expertise

Over the years, ADM has won numerous awards for its snow removal expertise, including two Balchen/Post awards for excellence in airport snow removal performance and one for de-icing from the American Association of Airport Executives. The secret to such a success certainly lies in a winter operations formula that combines best practices, advanced tools and experience. That is why ADM's expertise in snow removal is in high demand by other airport authorities around the world.

After all, YUL is an airport operating in a country of snow, and ADM's team have know-how and experience that very few people can claim to possess! ❄️

MONTREAL-TRUDEAU AIRPORT WINTER OPERATIONS AT A GLANCE:

- Manoeuvring area: 1.9 million square meters
- Average annual snowfall: 220cm
- Average number of weather events: 80
- Volume of snow loaded: 600,000m³ (10,000 trucks)
- Winter operations team: 32 permanent employees and 90 seasonal workers
- Operations: 24 hours a day, seven days a week.

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Keeping the gateway to **Scotland's North East** open and operational

Aberdeen International Airport receives its fair share of cold winter weather. Despite battling with the COVID-19 pandemic, where many airports have been forced to closed, Aberdeen provides a crucial link to the region and worked hard to remain open and operational. *International Airport Review* spoke with **Mark Beveridge**, Operations Director at Aberdeen Airport, to see how the airport approaches its winter operations.

ABERDEEN INTERNATIONAL AIRPORT (ABZ) is unique in that it is comprised of one fixed wing and four helicopter terminals. It has a long-standing history in the North East of Scotland, providing services to business and commercial passengers, particularly for those in the energy sector, given its prime location just north-west of Aberdeen City Centre.

The airport has overcome many challenges in its proud history, but nothing quite like the unprecedented encounter of COVID-19 and the worldwide pandemic. This pandemic has had a significantly detrimental impact on not only Aberdeen Airport, but the entire aviation sector across the UK. Airports have been operating at a fraction of their capacities and the sector's recovery has been forecasted years into the future.

have really struggled to continue to flow in the North East. This meant that, at times throughout the pandemic, we were the busiest airport in the UK in terms of air traffic movements.

Delivering a winter maintenance plan during a pandemic

Since taking up the role of Operations Director at Aberdeen International Airport in November 2020, I have been working alongside our many business partners as we set out a strategic recovery plan from what has been the biggest downturn ever experienced in the aviation industry.

A series of health measures were also introduced to provide a safe environment for staff and passengers. This included enhancing an already thorough cleaning regime and helping staff and passengers observe physical distancing.

However, one thing that has not changed is our dedicated team's ability to deal with major weather events, like snow and ice, in our corner of the North East of Scotland. Our open airport ensured that the lights were kept on throughout the country and our winter maintenance plan was prepared



Our heavy-duty machinery keeps our runways and taxiways clear of snow and ice to allow our fixed wing and helicopter flights to land and take off safely from our airport ”

Whilst many businesses across Scotland and the rest of the United Kingdom (UK) were forced to close due to the pandemic, Aberdeen Airport remained open.

Throughout 2020, we were open: To support crucial lifeline services to communities in the Highlands and islands; for air ambulance flights; to enable the distribution of much needed medical supplies; and to serve the oil and gas sector. The success of the region and airport are intertwined, and there is a heavy focus on providing the connectivity on which Aberdeen's internationally-focused economy is so dependent. If Aberdeen Airport had closed, the economy would

and ready to be implemented.

Throughout the winter months, between November and March, snow and ice make a regular appearance at Aberdeen Airport, but we are equipped and prepared to make sure that it doesn't impact our operations.

Our fleet of snow ploughs, de-icers and sweepers are readily available to combat the weather when snow falls across the North East of Scotland. Our heavy-duty machinery keeps our runways and taxiways clear of snow and ice to allow our fixed wing and helicopter flights to land and take off safely from our airport.

We have a dedicated, trained and well-equipped team prepared for the variety of weather conditions »



that we experience here in Aberdeen. Our airside operations and engineering team work to keep our airfield, aprons and supporting areas ready for aircraft and passengers.

The terminal team also assist and are on hand to help to provide details on the rebooking of flights during any major disruption. They will also do what they can to help passengers who may also need emergency supplies, like baby milk or food.

Investment into airport vehicles

Already in 2021, our team have been put into action as snow and ice accumulated on the runways. But, as always, the airside operations team kept the airfield safe and operational in a timely manner.

Part of the timely turnaround is due to the investment made into the airport's fleet of vehicles back in 2013. The £1.3 million upgrade included modernising and optimising the snow fleet, demonstrating to our business partners the airport's readiness and commitment to ensuring operations can continue in times of dramatic weather.

Interestingly, part of the investment in 2013 was an enormous, state-of-the-art £700,000 fire engine, which starred in the Transformers movie, and electric and hybrid vehicles to support the airport's sustainability commitments.

The vehicles, including snow ploughs and sweeper units, help to ensure the readiness of the airfield even

when the elements are against us. Steel wire brushes, attached to the middle of the sweeper unit, rotate at high speeds, clearing snow from the 1,953m long runway, before being blown off the tarmac by a blower unit located at the rear of the vehicle.

A snow cutter is then used to reduce the snowbanks created by the sweeper units. The full snowbank is then blown into the grassy area before de-icers give the tarmac its finishing touches, bringing the pavement conditions back to blacktop. Reaching speeds of up to 24mph, it takes a convoy of winter operation equipment less than 30 minutes to completely clear the 1,953m long, 46m wide runway and get the airport back in full operation.

Our team is very proud of their work, and rightly so. Should snow and ice appear overnight, the team will begin at around 3am to start operations.

The 'Beast from the East' was no match for Aberdeen

Winter can be notoriously hard on airports, but, historically, Aberdeen has fared well in the worst of conditions. In February 2018, the weather event dubbed as the 'Beast from the East' affected the whole of the UK, with Aberdeen being no different. It led to more than 100 schools needing to be closed, 27,000 homes left without power and travel disruption across the road network.



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Aberdeen Airport's heavy-duty machinery keeps its runways and taxiways clear of snow and ice to allow fixed wing and helicopter flights to land and take off safely

However, our team had the determination and expertise to ensure that our airport remained operational throughout, with only a limited number of cancellations during one of the worst winter events experienced by the UK. Our staff did a tremendous job in keeping the airport open and providing passengers with timely updates throughout. Our snow ploughs and cutters proved an invaluable investment.

Positioning the city as a destination

The COVID-19 pandemic has not affected our airside operations and the team's ability to carry out their duties to a very high standard, and we are confident in our future winter maintenance plans. Before COVID-19, our snow teams were already regarded as one of the best across the UK, and we aim to continue that. For both the region and the airport, the recovery from the pandemic will be a gradual process, with predictions showing that it could be more than three years before we return to 2019 levels of aviation. However, Aberdeen International Airport was ready, with the finishing of its ambitious £20 million terminal transformation project in 2019, the largest development in the airport's history. This doubled the size of the terminal, saw new retail and catering outlets introduced and two brand new lounges for our passengers to enjoy.

Before lockdown and the pandemic, there had been an anticipation of growth throughout the region. The city had positioned itself as a destination for culture and the arts with the Nuart and Spectra festivals. Additionally, £300 million was invested in a new state-of-the-art arena called P&J Live, which, in 2019, hosted events including the BBC Sport's Personality of the Year and SPE Offshore Europe, bringing thousands of people to the city via the airport.

The construction of a new harbour is also well underway, giving great potential to bring more people to the area, with cruise ships starting and finishing in the city.

Looking to the future

In the long-term, post-COVID-19 pandemic, the North East of Scotland and Aberdeen will have a heavy focus in retaining and enhancing the connectivity needed for the region, as well as growing back with sustainability underlying all of our future operations and ensuring that our commitment to Net Zero by 2045 is achieved. It will be a slow, gradual recovery at the airport, but what will not change is the role of aviation in driving the economy. It is crucial that we provide the connectivity, which will ensure growth, employment and prosperity. What also will not change is our team's ability to keep the airfield and airport open and operational during snow events. ✉



MARK BEVERIDGE

Beveridge joined Aberdeen International Airport as Operations Director in 2020. He has held a number of senior positions in the energy sector, including Regional Director and Regional Operations Director with TWMA and Sparrows. Beveridge has extensive senior operational experience in a safety focused environment and, having worked and led large teams in the energy sector, he brings years of operational and commercial experience to Aberdeen International Airport.



Expecting the unexpected at Edmonton International Airport

Steve Maybee, Vice President of Operations and Infrastructure at Edmonton International Airport, discusses the challenges that the airport faces due to the changeable Canadian weather and how they are able to deal with it in order to remain operational.

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WE ARE NO strangers to snow, ice and cold weather at Edmonton International Airport (EIA). We often refer to ourselves as Canada's gateway to the North, as we are the most northern-based major airport in the country.

The winter of 2011 is one I will never forget. Between January and February 2011, it snowed for 24 days straight, and our crews had to respond adequately. When we finally stopped shovelling, it came to 218cm of snow, including one 24-hour period with 42cm of snow and 16 days with more than 6cm.

EIA is Canada's largest major airport by land size, with roughly 7,700 acres of land. We are located

south, outside of city limits and, with that, comes a lot of open space for the winds to roar, the snow to drift in from farm fields and temperatures that are always just a little bit below the warmth of the city centre.

Towards the end of 'Snowmageddon 2011', as it has come to be known, we were in a full 'all hands-on deck' situation, as our crews were exhausted. I will never forget personally helping to reload bristle sweepers in our operations building so that the drivers could focus on snow removal. If you could drive the trucks or carry a shovel, you were drafted, and my directors and I spent time clearing apron areas for ground handling crews and helping to clear public areas.

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In Edmonton, you do not close because of some snow. But that does not mean that it's easy to stay open either ”



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Training, science and more training help EIA succeed against the snow

Throughout that entire span, we never closed. In Edmonton, you do not close because of some snow. But that does not mean that it's easy to stay open either.

Winters are evolving

In fact, this 2020-2021 winter season in Edmonton has been mild by temperature standards. Our first major snowfall of this season arrived on 6 November 2020 with a dump of 40cm over a 16 hour period. However, much of December 2020 and January 2021 has been above normal temperatures with limited snowfalls.

That does not mean that we haven't been busy. In fact, it has become undeniable that our winters in Edmonton are changing. Climate change and changing weather patterns have brought their own challenges in recent years. For one week this year, in January 2021, our crews have had to handle rain, freezing rain, sleet, snow and, a first for our airport, a 'snow squall', where winds gusted in the middle of the night at speeds of 107km per hour for some periods, blasting our airport with snow and forcing our employees and others to make sure that every bit of exposed equipment was secured in order to prevent objects from blowing onto the runways, potentially endangering planes.

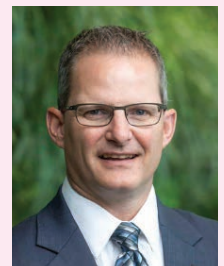
Our airport, like all others, relies on weather forecasts and advance warning systems. We saw these systems coming and were prepared. However, we do not rely on just one or two systems, but track five major weather sources continuously.

Making science and data-driven decisions

Science and data drive our decisions. Our crews are experienced and professional, but 'trusting your gut' is not adequate when it comes to preparing for storms. We strive to understand the severity, content, wind speeds, pressure and temperature of the air versus surface temperature of our runways and aprons, because all of these factors affect our plan of attack. It truly is science as much as experience.

When we know that a storm is imminent, our crews are ready to move. If we know that there is potential for rain or freezing rain, our crews move to spray our runways and aprons 10 to 15 minutes in advance of the storm's arrival with a potassium-acetate solution that inhibits the formation of ice. All of the substances that we use on runways and other areas are approved products from Transport Canada, which are environmentally responsible and safe.

EIA's airside has 2,665,336m² to clear when the snow arrives. Groundside, there is 4,200,000m² of public roads, parking lots and sidewalks to handle. This includes all of the roadways through our Airport City complex, which is home to a major shopping outlet mall, casino and horserace track, our cargo village and other significant light-industrial developments. Our in-house crews clear it all. Perhaps because we live it every year, our community has high standards for snow removal - if the roads aren't clear or the sidewalks are icy, we'll hear about it. »



STEVE MAYBEE

Maybee is the Vice President of Operations and Infrastructure at Edmonton International Airport. Before joining the aviation industry, Maybee worked in the oil and gas industry with Chevron Canada in northern Alberta. He joined Edmonton Airports in 1992, starting in Contracts and Procurement, where he obtained his Professional Designation in Supply Chain Management (SCMP) and led the Procurement and Contracts department through two major terminal expansions before moving into the position of Director of Human Resources. He later joined the Operations department as Manager for Airside Operations and was promoted to Vice President of Operations in August 2014. In August 2018, the Infrastructure department was added to his portfolio.



Science and data drive our decisions.

Our crews are experienced and professional, but 'trusting your gut' is not adequate when it comes to preparing for storms

Training field crews to ensure top performance

Time is the most significant factor. Our crews work 12-hour shifts 24/7, and we constantly evaluate performance. Training is key; when they are not out in the field, we are training and reviewing. Our field crews must be more than operators, as they deal with our biggest stakeholders every day and need to be able to manage relations with airlines, NAV Canada and other contractors.

It is about trust. The airlines need to trust that we are doing our jobs to put their safety and the safety of all our passengers first. We only accept excellence in our crews, because we are dealing with people's lives and we don't get second chances.

The COVID-19 pandemic has, of course, presented its own challenges. This winter season, we have strict rules on how the crews can interact with each other and who can even enter our Airfield Operations Facility. We have been fortunate with no cases of the virus in our crews.

Embracing future technology and innovation

Unfortunately, I don't have a crystal ball for the future, and weather is inherently unpredictable and may continue to change in future years.

At a corporate level, EIA's strategic business plan is dubbed 'Innovation Expansion'. That is because, as an airport, we are focused on embracing the future, using technology and innovations to change how we do business. That will continue, perhaps a little slower due to the pandemic, but it will move forward and touch all aspects of our business, including winter operations. An example



is a partnership with a local company, Absolute Combustion, which has developed a new aircraft heater that has drastically lower emissions and improved fuel efficiency and performance over existing heaters. It was developed and tested at our airport. Our operations team has also embraced the use of remotely piloted aircraft, or drone technology, at our airport. We consider ourselves a leader in Canada in using drones, and we are now exploring how they can be used to improve our winter operations by refining the weather data that we can access in real time.

My leadership group and I know that we are good at this, but we can never stop challenging ourselves to be better.

I hope I will never see a winter quite like 2011 again, but this is Canada, and you learn to expect the unexpected. ❄️

EXPERT VIEW

A LICENCE TO RE-OPEN



LARS BARSOE

Vice President Sales & Marketing,
Vestergaard Company A/S

EVEN BEFORE the outbreak of COVID-19, air travel was under pressure.

Some non-governmental organisations and political activists were advocating less travel and heavy taxes on aircraft emissions. In the wake of the pandemic, some governments have attached conditions to aid packages including the scrapping of domestic routes where trains are a viable alternative. At the same time, the developed world is becoming more affluent and air travel is becoming affordable for more people, so the demand is growing. In order to balance these two trends, airports, airlines and partners need to find more sustainable solutions. Aircraft are already being switched with newer types which use far less fuel and thereby emit less. And there are several companies developing electrical aircraft where the goal is to fly 100 passengers for at least one hour on electricity only within the next five

to seven years. Of course, that trend will only strengthen in the coming years. On the ground, there are already sustainable solutions to many of the tasks at hand, and Vestergaard Company has increased its development activities during the pandemic to bring more sustainable solutions. Vestergaard Company now manufactures its own electrical chassis on which until now we can put toilet service or water service tanks. The units are plug-in and can totally replace normal diesel versions.

No more diesel emissions or fumes on the apron. Also, there is now an electrical de-icer on the market, the Elephant e-BETA. This de-icer can be operated in fully electric mode at gate or on de-icing pad eliminating emissions and fumes. No more units sitting around with engines idling making a significant contribution to reducing the carbon footprint in airports. We call this the "licence to re-open". The future may not be so bleak. ❄️