

# Briefings

A publication of the Airport Technical Assistance Program of the Center for Transportation Studies at the University of Minnesota

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## Is more ice the new normal?

Despite the occasional polar vortex, Minnesota's climate is warming. According to the Minnesota Department of Natural Resources, the state warmed by 2.9 degrees Fahrenheit between 1895 and 2017. And most of Minnesota's observed warming has been when it's coolest: since 1970, winter has warmed 13 times faster than summer. One result of warmer winters is more ice—in addition to, or instead of, snow events. For Minnesota airports, especially those lacking experience in dealing with ice, that can mean more challenges in maintaining safe operating conditions.

As deputy director of Rochester International Airport, Kurt Claussen oversees most airport operations. Having been with the airport for 28 years, he's dealt with plenty of winter weather. Over the last three years, however, he says the airport is seeing more frequent—and more significant—ice events.

In this issue of *Briefings*, Claussen shares what he's learned.

As one might expect, handling snow and ice for an airport is much different than for roads. "On a highway, a half-inch of snow isn't a big deal, but that's not true for a runway," Claussen says. Any snow or ice can cause hazardous conditions that could contribute to aircraft incidents and accidents. And more treatments are available for treating highway snow and ice than for airports. Airports have a limited selection because any treatments have to be FAA-approved. For example, chemicals from the chloride family, which are highly effective on roads, are corrosive to aircraft.

The airport has 15 operations staff members who are cross-trained in maintenance and firefighting. Because Rochester has air carrier service, the FAA requires certain equipment. This includes two large snow blowers and several large plows, but the airport's primary tools are its big brooms, with heads about 4 feet tall and 18 feet



*Two brooms work to mechanically remove contaminants from the runway at Rochester International Airport.*

wide. "Anything you can take off mechanically is better than taking it off chemically, especially in warmer weather," Claussen says. "The more you plow surfaces, [the more] you push snow down into the cracks, and that can make it more slippery. So we're brooming more. That gives us better friction and traction."

According to the FAA, the type of broom used to remove a layer of ice is important, since in some cases the broom may actually "polish" the ice, reducing traction. Steel bristles are better than poly bristles since one cuts the ice surface while the other flips snow.

A primary goal for airport operations is prevention—preventing a bond from occurring between ice and the pavement is always preferred over removing bonded ice once it has formed. Besides equipment, the Rochester airport relies on chemical anti-icers and deicers. Liquid chemical (Cryotech E36 liquid) is the airport's first line of defense, and is used more frequently than solid product. The airport takes a proactive approach to pre-apply liquid as an anti-icer before freezing rain to prevent ice from forming and bonding when it can. In situations where ice has already formed, crews use solid pellets. Claussen explains that a pellet product will make holes in the ice layer that a liquid, applied afterwards, can

seep into, thus more effectively melting it.

FAA-approved liquid deicing and anti-icing products include glycol-based fluids, potassium acetate base, and potassium formate-based fluids; approved solid compounds include airside urea, sodium formate, and sodium acetate. Application rates for a specific product are based on manufacturer recommendations. While fluid and solid specifications cover technical requirements for deicing and anti-icing products, they do not address the compatibility issue of combining products during operations, so airport operators should ask manufacturers about the proper use of concurrently applying multiple products.

To respond appropriately to a winter storm event, airport staff need accurate and timely weather information. Reliable forecasting will improve effectiveness and efficiency of an airport's operations and save costs on chemical use and efforts. These days, weather information is readily available on the Internet. Rochester uses several different sources, including the National Weather Service Office in La Crosse, WI, which allows access to live help 24-7 if they have questions about what they're seeing. "Radar is not an exact science, especially

*Ice continued on page 2*

concerning rain, freezing rain, snow, and sleet,” Claussen says.

And because of wind, pavement temperature, air temperature, air moisture, and myriad other factors, no two weather events are ever the same. “There are so many variables,” he notes.

For example, he’s learned over the years that the weather service will call an event “freezing rain” only when the air temperature is below freezing and it’s raining. “But for us, if it’s 33 degrees and raining, and the pavement temp is 18 degrees, the pavement is cold enough for the water to freeze—it’s not going to run off,” he says. “I thought we had some pretty significant events because of the pavement temperature that weren’t officially called freezing rain. But it caused the same problems.”



A truck spreads E-36 liquid runway deicer during a freezing rain event at Rochester International.

In October 2016, the FAA implemented a new process, developed with input from all industry stakeholders, for assessing and reporting airport conditions called the Runway Condition Assessment Matrix. “In the past, everything was friction-based, [but] now it’s more contaminant-based,” Claussen says. Most airports, including Rochester, still measure friction, but no longer report that information as part of the runway conditions under the new system. “We still find the friction measurement very useful from a trend analysis standpoint,” Claussen says. He explains that minute changes in those numbers are a helpful indicator of what is happening with the pavement surface, and tracking those changes allows the airport to react and respond before the pavement condition reaches levels that will impact operations—allowing a sort of “grace period for our reaction,” he says.

Although ice has always been a factor for the Rochester airport, it may become a new and increasingly common challenge for other airports in the state. “It seems like the line has kind of crept [north]. We’d always gotten a fair amount [of ice], but more northern Minnesota airports haven’t.” Those airports may lack the equipment for dealing with it. “It’s expensive,” Claussen says. “Maybe we come up with some type of cooperative purchase. Maybe a tank and sprayer, or a truck for putting down solid

deicer.” Claussen says staff at these airports may not have much experience dealing with ice, either. Snow and ice control guidance from agencies such as the ACRP is more general, he adds, “but every airport’s needs are different.” If a smaller airport can only choose one product, Claussen would recommend a solid deicer over a liquid. The solid may work better to remove ice that has formed overnight—which may be a more common occurrence for small airports that aren’t operating 24 hours a day.

Claussen emphasizes that he’s no expert; rather, he learns something from every event. The airport staff relies on best management practices gained from experience, meeting every week and evaluating past events. “What I emphasize when we talk about these events is that we’re not critical of what was done,” he says. “We want staff to be open and honest and not defensive. We just ask, ‘If we could do this over again, what might we do differently?’”

*Additional sources consulted:*

- FAA AC 150/5200-30D, *Airport Field Condition Assessments and Winter Operations Safety*
- Minnesota Department of Resources website, “Climate Trends”: [www.dnr.state.mn.us/climate/climate\\_change\\_info/climate-trends.html](http://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html)

## TPT, MnDOT create drone safety video

So you own a drone. Now what?

That’s the title of a new video created by Twin Cities PBS-affiliate TPT and the Minnesota Department of Transportation (MnDOT) in partnership with the Federal Aviation Administration (FAA). Speakers in the short video discuss steps to take before your maiden flight.

“We partnered with TPT to get the word out on how to fly safe,” says Cassandra Isackson, director of MnDOT’s Office of Aeronautics. This is the first in a series of videos related to drone safety that MnDOT Aeronautics is producing with TPT, she adds.

Tony Fernando, MnDOT’s unmanned aircraft systems program administrator, says the first thing a drone pilot must do is register with the FAA. “Remember that drones are aircraft—and aircraft are very highly regulated,” he says.

Several additional state and federal requirements need to be fulfilled before operating a drone for purposes other than recreation.

In the video, Fernando shares specific guidelines for safe drone operation: Keep the aircraft in sight, do not fly over people, and stay clear of airports, heliports, and hospitals. He also discusses smartphone

apps that allow users to do their flight planning. “Some of them will show the geographic limits of state parks and national parks where you’re not going to be able to fly,” he says.

The video and more guidance from Fernando are available on TPT’s “Twin Cities PBS Originals” website.

*Learn more at:*

- So you own a drone. Now what? (TPT and MnDOT, Dec. 18, 2018, 4:28) [tptoriginals.org/so-you-own-a-drone-now-what/](http://tptoriginals.org/so-you-own-a-drone-now-what/)
- [Dronezone.faa.gov](http://Dronezone.faa.gov)

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# An airport story's: Granite Falls Municipal Airport

The Granite Falls Municipal Airport is a city-owned, public-use airport located four miles south of Granite Falls in southwest Minnesota. It's small—with 5,200 square feet of paved surface, eight hangars, and 25 planes in total—but because it brings both businesses and tourists to town, it has a significant impact on the local community.

The airport gives a variety of services to the local community. It houses two jets and two piston airplanes on behalf of Fagen Incorporated, a local construction company that uses the airport to transport personnel. The airport also has four private hangars where local small businesses and private owners can store their planes.

"Airports are always important to economic development because we live in a mobile society and the airport is another means to make us accessible to the bigger world," says Keith Woods, manager of the airport. "It attracts business because people like to be able to come and go."

The airport is also regularly used by the local hospital—Granite Falls Health—to airlift critical patients to more advanced facilities in the Twin Cities and Rochester.

"It's challenging having a hospital without some sort of airlift possibility," says Crystal

Johnson, city manager of Granite Falls.

The biggest tourist draw of the airport is the Fagen Fighters World War II Museum. Located on the airport grounds, it was officially opened in 2012 and features a diverse collection of antique planes, vehicles, art exhibits, and media from WWII. Once every three years it hosts an aerial show during which the antique planes are brought out and flown. The 2018 show drew around 17,000 people and brought a spike in tourism business to the nearby town.

"When people come to the event, they're visiting the local stores, they're eating at local restaurants—which in turn helps the overall local economy," Johnson says.

The Granite Falls airport was not always widely appreciated by the community. According to Woods, prior to its construction in 1996, locals were skeptical of the need for a new airport and were concerned about the cost and land acquisition involved.

"But perception has changed because people see that it attracts people, which is good for the whole local economy," Woods says.

The airport has grown steadily over the years; around 2005, it had a 650-foot displaced threshold added to one of its



runways. In 2017, the airport was resurfaced and added an 800-foot stopway to the north end. Plans to expand further are on the table; the airport is currently waiting to hear back from the state about an eight-unit T-hangar that Woods says they hope to build sometime in 2019 or 2020.

"I really want to extend kudos to MnDOT Aeronautics for working with us to make improvements," Woods says. "Under the current leadership, it's been a dramatically improved situation for the small, state-funded airports."

—Sophia Koch

*Editor's note: Be sure to join Minnesota Viking Harrison Smith on a tour of the Fagen Fighters World War II Museum at this year's Minnesota Airports Conference in April!*

## Mankato lighting renovations make taxiways brighter, easier to repair

The Mankato Regional Airport recently underwent a \$1.8 million project to update its taxi lighting system, improving visibility for pilots and ensuring that future repairs will be easier to do.

"It was a big project," says airport manager Kevin Baker. "The lights were originally installed in the early 1970s. They were direct burial wiring and we were having a lot of ground faults and just issues with not being able to get parts."

With the hope of getting funding, the City of Mankato submitted the project to MnDOT's Capital Improvement Program and to the Federal Aviation Administration (FAA). The project was then picked up by the FAA, which had leftover funding from its last fiscal year to pay for 90 percent of the project. An additional 5 percent was paid for by MnDOT, leaving the final 5 percent to be funded by the City of Mankato.

The project was completed in the summer of 2018. With help from engineering firm TKDA and contractors that included River City Electric Company, the airport

set about removing the older, less-efficient incandescent system of taxiway lights and replacing it with LED lighting—392 fixtures in all. The wiring between lights, instead of being directly buried, was run through conduits so that it can be more easily dug up and accessed.

"Now, if we do have a problem with the wire in between the lights, we could simply pull that wire and put new in," Baker explains.

With the new lights—which mark the edges of the taxiway—in place, Baker says that it's easier for pilots to see where they are going when they taxi to or from runways. The new LED lights are brighter, more uniform, and 50 percent more efficient than their precursors.

"This was one heck of an upgrade," Baker says. "The City of Mankato is very appreciative that we got picked for that project."

This upcoming summer, the Mankato Regional Airport will have a chance to show off the renovations at the Minnesota Air Spectacular—an airshow that Mankato will

be hosting on June 15 and 16. Early general admission tickets will be \$25 until June 8, and the show features performers such as the U.S. Airforce Thunderbirds. It has been four years since Mankato last hosted such an airshow, and Baker anticipates that better traffic planning this year will make for a smoother show.

"I just pray for good weather," he adds.

—Sophia Koch



## Annual conference heading to Willmar

We're looking forward to seeing you in April at this year's Minnesota Airports Conference—you *and* special guest Minnesota Viking Harrison Smith! Smith, who overcame a fear of flying by learning to fly himself, will join attendees for a tour of the Fagen Fighters WWII Museum—home to a pristine collection of fully operational, active aircraft and vehicles from World War II—located at the Granite Falls airport. You can hop on a bus from the Willmar Conference Center Wednesday a.m. to take part in this outing. Afterwards, at the conference's opening luncheon, Smith will talk about his unlikely journey to becoming a licensed pilot and maybe even share a few anecdotes about his time on the football field.

As always, the conference will feature experts in aviation and aerospace fields shar-

ing knowledge in engaging presentations, workshops, and open forums with ample opportunities to network with vendors and colleagues. Session topics will include sustainable and resilient airport design, obstructions, and updates from the FAA and MnDOT Aeronautics. In addition, "Airport 101" sessions designed especially for managers of small airports will cover "60 tips in 60 minutes," snow and ice control plans, and



Capital Improvement Programs.

You won't want to miss what promises to be a memorable conference. Registration is available now at [airtap.umn.edu/events/airportsconference/2019/](http://airtap.umn.edu/events/airportsconference/2019/).

The conference is hosted by the Minnesota Council of Airports and MnDOT and is facilitated by AirTAP.



## More aviation events

Here's a great way to promote aviation to students! Two free aviation-related career events will be held in March at the Earle Brown Heritage Center in Brooklyn Center, MN.

### Aviation Career Forum

**March 25, 2019**

**9 a.m.–3 p.m.**

This forum will give high school and college students an opportunity to gather aviation career resources, ask questions, and network with businesses, colleges, and organizations. Lunch is provided but space is limited. Register by March 18 at [aviationcareerforum.eventbrite.com](http://aviationcareerforum.eventbrite.com).

### Fly into Aviation Night

**March 25, 2019**

**6 p.m.–8 p.m.**

This event will offer attendees a chance to learn what a career in aviation is like by talking with industry professionals. Register by March 18 at [flyintoaviation.eventbrite.com](http://flyintoaviation.eventbrite.com).

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