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INSIDETHEFENCE

Joe Petrie
Editor-in-Chief



Now I Have Your Attention

On Feb. 20, I was on a flight from Milwaukee to Tampa (Southwest Flight 1519), when a passenger had a severe medical emergency. The crew sprang into action, called in all medical personnel on the flight to assist and after performing an emergency landing, rescue officials in Tampa took over and the ground crew did their job moving us around in a timely fashion.

Without breaking a sweat, airline and airport workers saved a person's life. And when everyone applauded their efforts, the only response they gave was "this is what we're trained to do."

You might not realize this, but what you do is really amazing to the rest of the world. They just don't realize it until they see it in action.

Airports Council International – North America (ACI-NA) recently released a report showing our airports need a \$100 billion in investment by 2021 just to accommodate growth. That's a big number and something that can frighten a lot of politicians. If you want to lessen their consternation, you need to show them what you do.

Airports are quick to tout new flights and major construction projects to their local press,

but don't share the day-to-day work that is really unique. Educated the public about what you do and show them why you're important.

In this issue, we look at the snow plow rodeo put on at the IASS in Buffalo. The public doesn't think about snow removal at an airport despite it being one of the most critical and skillful jobs on the airfield. But when the local press was invited to see the rodeo in action, it showed the public how imperative it is to allowing them to travel.

Most people don't give a second thought about a runway while going through the air-

"if you want to reach people, don't tell them a story—show them a story."

port or how it operates outside of where they'll find the closest bathroom or eatery. If you show them how interesting it really is via your local press outlets, you will be surprised how fast they catch on.

The industry has a lot of challenges facing it this year, but there conditions are present to make meaningful gains for airports across North America.

Getting the support for airports means gaining the support of the public, so in the advice of my first news editor when I broke into the industry, "if you want to reach people, don't tell them a story—show them a story."



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Civil Design + Alternative Delivery + Partnership

Accelerating Delivery of a Modernized Terminal from the Center of the Design-Build Process

At Fort Lauderdale-Hollywood International Airport (FLL) on Florida's southeast coast, a modernized terminal is taking shape to support Southwest Airlines' growing international business. This fully updated terminal will include a new concourse and five international gates, and is scheduled for completion in mid 2017.

Inside and out, contemporary architectural details will blend with robust new facilities for concessions, security and customs and border patrol. In addition, updated lighting, lavatories, new terrazzo and ticketing kiosks will contribute to a better passenger experience. And the modernized terminal's greater capacity and streamlined layout will help Southwest add flights and new destinations for customers while maintaining an on-time performance centered on quick turns on the ground between flights.

This is Broward County Aviation Department's Terminal 1 Modernization and Concourse A project. The terminal's final design and construction are on target for completion in two years, meeting an aggressive schedule delivered through Construction Manager at Risk (CMAR) contracts. Final design was completed in a little more than a third of that time. Through constant coordination, the design team delivered final design and construction phasing in nine months. And at the center of almost every coordinated step were civil engineering components.

HOW ALTERNATIVE DELIVERY PRESCRIBES COLLABORATION

HDR serves as the civil design lead for the Corgan and Gresham, Smith and Partners architectural team. For this project, civil engineering included traditional work such as airfield pavement design, structural components, land development and stormwater management. But it also governed utility relocation, building services, permitting and regulatory coordination, gate closures and work-area designations, and traffic redirection on the apron and in ground transportation areas.

The CMAR delivery method involves all parties from the start, which worked well to facilitate coordination between the designers, the constructors, and, most importantly, the airport operator and airlines such as Southwest, which are using Terminal 1 throughout construction.

Alternative delivery has allowed HDR's team to advance an ambitious schedule while so far avoiding a pile up of change orders, which can decelerate forward progress when a project uses the design-bid-build (DBB) delivery method.

At best, change orders slow down work flows; at worst, they create an adversarial relationship between design and construction teams. They are not needed when coordination is streamlined through a team central to the process, such as the civil design team, and that process is built around rigorous collaboration, which is necessarily the case with alternative delivery. This kind of cooperation is vital to

Project work-space parameters result from the civil design team's extensive coordination with architects, the construction manager, airlines and the airport operator. Image courtesy of HDR.



success in aviation projects, where the need to keep gates operational limits available work time and establishes work-space parameters that are often unmovable.

CIVIL DESIGN'S CENTRAL ROLE

Throughout final design, representatives from civil, architecture, the construction manager and the airport met at least once a week via Blue Beam Studio to review drawings. When the construction manager laid out plans that required a few extra feet in which to work, HDR's civil team could reconcile variables based on its knowledge of regulations, permitting, airport operations and the design schedule.

During final design and as needed during construction, HDR has used Building Information Modeling (BIM) and Civil 3D technology to identify when it was justifiable to allow greater flexibility in work areas while still meeting operational requirements. These technology tools helped demonstrate when worthwhile

payoff would result from allowing extra time or space in certain situations.

As a case in point: on the land side of the terminal, the architecture team is adding a signature feature to the building. Consequently, the building needed to be moved outward about 18 feet from its original footprint. HDR's team developed plans to perform early drainage and utility work in order for the foundations to be poured. But both utility work and building construction would impact ground transportation areas.

Buses and taxis comprise considerable traffic in one ground transportation area, which needed to be kept isolated from areas where spouses, friends and families drop off and pick up passengers. HDR's civil design team worked closely with several parties: airport operations to create a phasing plan that would minimize impacts; regulatory agencies to obtain permits for moving utilities; and architects and the construction manager to phase construction around airport operations.



Updated lighting and terrazzo are two features of the all new Concourse A that will make for a better passenger experience. Image courtesy of Corgan.

When complete, the essentially new FLL Terminal 1 will represent more than great aesthetics and functionality — it will be a powerful example of what's possible by marshaling the right design team and using alternative delivery.



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A Whole New Take on a RODEO

In just its second year, the IASS Snow Plow Rodeo is rapidly becoming the premier event for snow removal personnel to show off their skills and give their job the recognition it deserves.



A

fter seeing tremendous success with the inaugural event in 2016, the International Aviation Snow Symposium (IASS) will once again host the Snow Plow Rodeo and Barbecue.

Jay D. Ball, director of facilities and grounds for the Roanoke Regional Airport Commission, who co-chairs the rodeo, said he got the idea for having the competition at the symposium from lighting classes he attended in the early 1980s in South Bend, Ind., where they had a similar event.

After seeing how competitive and what a morale booster the competition was for the snow fighters, Ball said he wanted to see that at his own airport.

"The competition was just unbelievable when I went there," he said.

When Ball came to Roanoke he brought the competition to the airport. He took it to the committee at the symposium and everyone agreed it was a great idea.

The crew at Buffalo Niagara International Airport worked with the committee as well to prepare the course for the competition, Ball said. About 50 people signed up, which he said was a surprise.

"Everyone that we spoke with last year said 'hey, you got to do it again,' so we're going to continue on," Ball said.

The second annual snow plow rodeo and barbeque will take place April 26, in conjunction with the NEC/AAAE International Aviation Snow Symposium, being held April 22-26 in Buffalo, N.Y.

The rodeo tests the skills of the operators through a course set up at the airport. Competitors are timed as they maneuver their way through cones in a plow truck with a 22-foot plow attached. Combining speed, skill and ability,

competitors work through a serpentine course; backing into a loading spot where they're judged and scored on the maneuver; and even a station where they have to determine where the plow is by using it to push a plunger in.

"It's the skill and ability of the operator to maneuver such a large piece of equipment through a course," Ball said. "You kind of think that on the airfield it's wide open, but there's lights, there's nav aids and all other kinds of obstacles out there and that operator needs to know where his implements are at all times, otherwise the electricity is going to get upset if you start knocking lights over."

Joe Guarino, airfield superintendent for Buffalo Niagara International Airport, said the rodeo course was designed by Ball and Tim Haizlip, director of maintenance, Louisville Regional Airport; who were assisted by Matt Gabbert, senior manager airport maintenance, Cincinnati/Northern Kentucky International Airport; Greg Chapin, account representative Franklin Paint; Tom Swanek, field maintenance manager, Omaha Airport; Ryan Rockovitz, superintendent of maintenance, Lehigh-Northampton Airport Authority; and Jim Moorhead, airfield maintenance supervisor, Pittsburgh International Airport.

Guarino said from his staff, Pete Robbins, maintenance supervisor, and John Kwasniewski, assistant maintenance supervisor with his department, were also instrumental in helping to make the rodeo such a huge success in 2016.

He said the event generated a lot of interest from the local press and lots of spectators even came out to see

Chris McBride, Third Place, 2016 Rodeo

- Age: 35
- Title: Grounds Person
- Years at the airport: 5

- *What brought you to this profession?* I came to the airport after working in construction operating heavy equipment.
- *What do you like the most about this industry?* It's a big change of pace from the construction world.
- *What is it you like most about being on the snow removal team?* Keeping the airport safe for the travelers.
- *What is the most challenging thing about being on the snow removal team that people may not realize?* Whiteout conditions and trying to keep everything open.
- *What was the most challenging storm you ever worked and what made it so difficult?* Freezing rain is the biggest hassle.

- *What is it about the snow plow rodeo that makes it an important competition for you and your peers?* The comradery
- *How did you prepare for the rodeo in 2016?* Going through the winter conditions.
- *Why would you recommend others like yourself should participate in the snow plow rodeo?* It's a way for the guys to show their skills and show off their airport in a fun competition.
- *What makes the rodeo so challenging and how do you prepare yourself?* The obstacle course is tough and you have to get yourself in the right mindset.
- *What is it about your airport's snow removal team that you think makes them one of the best in North America?* It's a solid group of guys and when it gets tough, you do your job into the best of your ability so you get the job done.

the rodeo firsthand.

With the competition and a barbeque catered by Fat Bob's, the event is just a way they can thank the workers out there who keep airports open in winter weather with a fun event.

"It's hard work so we really wanted to recognize them for the work they do," Guarino said.

Not only is there awards for the top three participants for the rodeo, but Ball said there's also a traveling trophy that goes back to their home airports for the year.

Pittsburgh International Airport took the top honors in 2016 and Ball said he knows there are

plenty of airports out there looking to knock them off the top spot in 2017.

"I know I have one operator that's just ready to go," Ball said. "It's the excitement and it's something different at the snow symposium, which is down at the convention center and this gets them out to the airport and they can drive the equipment and compete, which is just human nature."

"It's a good time. Not only is it fun, but you're building comradery with other snow fighters from other airports," Ball said. "And there's the overall competition. You can talk the talk, but



let's see if you can walk the walk and get out there and run with the big dogs if you will."

Creighton Pritzlaff, director of sales and marketing for Wausau Equipment Co., said the company got involved in the rodeo because it's not only an opportunity to extend gratitude to the snow removal workers, but to give them a chance to showcase their skills.

"We recognize it's a terrific opportunity for equipment operators to demonstrate their skills and it gives them some well-deserved recognition for the hard work that they do to keep airports open in the middle of winter," he said. "These guys who actually run the equipment are sort of the unsung heroes of civil aviation and we've got a lot of respect for the community of airport field maintenance workers."

Pritzlaff said the snow removal workers have an incredibly difficult job, but tend to be invisible to the general public, so events like the rodeo provide a valuable chance to raise awareness of the valuable skills the snow removal equipment operators possess.

"I think this is a great opportunity for these guys to get some appreciation and recognition and there's some good natured competition that takes place," he said. "These guys have unique jobs in a unique environment, so there's natural comradery and this sort of event talks to that."

Pritzlaff said the event's popularity comes from the pride snow removal workers have in their jobs and recognizing not everyone can do this type of work.

"People take a lot of things for granted and this is an opportunity for them to see just how challenging it is to operate this oversized runway equipment. The plows are practically twice the length of an ordinary highway plow that people encounter on a daily basis. It's a much more challenging job than running your average snow plow."



Matthew Wilson, Second Place, 2016 Rodeo



Matthew Wilson, operator, field maintenance, Cincinnati/Northern Kentucky International Airport Cincinnati/Northern Kentucky International Airport

- Age: 32
- Title: Operator, Field Maintenance
- Years at the airport: 12
- **What brought you to this profession?** I started working at the airport in the grounds maintenance department on the grounds at the airport and moved into field maintenance when a position opened. I've always been interested in horticulture and have two associate degrees.
- **What do you like the most about this industry?** I like being on the airfield. I enjoy running the equipment, paying attention to details and am good at holding others accountable.
- **What is it you like most about being on the snow removal team?** The money is good for over-time (with a smile). When you think two inches of snow isn't a lot, it adds up in a hurry. There's a lot more to snow removal than people would expect, including knowing surface conditions at all times and all of the coordination and communication that is required.
- **What is the most challenging thing about being on the snow removal team that people may not realize?** For employees with families, the schedule can be challenging. But, having the multi-functional equipment we have at

CVG allows us to be more efficient and allows for better schedules for employees.

- **What was the most challenging storm you ever worked and what made it so difficult?** Each storm has its own challenges because they are so different. One degree colder or warmer changes everything.
- **What is it about the snow plow rodeo that makes it an important competition for you and your peers?** I get to meet and get to know people from around the country that do the same work and get to see how seriously we all take our work. It's interesting to learn what weather conditions other airports work in.
- **How did you prepare for the rodeo in 2016?** I practiced a scenario of the course.
- **Why would you recommend others like yourself should participate in the snow plow rodeo?** Yes, I would recommend it to others. It's fun to get competitive.
- **What makes the rodeo so challenging and how do you prepare yourself?** I do this every day so feel comfortable and confident with my skills. But, when it's time to compete, your adrenaline kicks in and it can become nerve raking.
- **What is it about your airport's snow removal team that you think makes them one of the best in North America?** CVG runs an efficient program, and we take care of our equipment. Our people are committed and hard working with a great work ethic. Our training is high-quality and begins in August every year to prepare for the upcoming season.

See you in Buffalo, NY!



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The Rolling Office Made for Airport Facilities

Getting the right cleaning carts for staff can make a key difference in keeping on top of facility maintenance.

Chicago O'Hare International Airport is one of the largest and busiest airports in the world. The airport is situated on more than 7,000 acres, has nearly 150 gates for its two hub carriers, has the capacity to move 2,400 people per hour and has more than 200 food, concessions, beverage and retail locations.



Hooks on the outside of a cart allows janitorial products to come along for easier and more efficient cleaning.

Impact Products LLC

And O'Hare is certainly not alone in such capacities. Numerous very large airports can be found in the United States and around the world. What these stats tell me, as someone who has been in the professional cleaning industry for more than 20 years, is that there is a heck of a lot of cleaning necessary to maintain airports of this size.

I'm sure airport administrators are well aware of this, but what they may not realize is how important it is that the cleaning professionals in their facilities are equipped with the best-suited rolling offices to perform their cleaning duties. What is a rolling office for cleaning workers? It is none other than the janitorial cart designed to store all of the tools, chemicals and equipment the cleaning worker needs.

While the airport C-suite is likely not very focused on janitorial carts, for custodial workers, these carts are so important that they become part of the family. Just think about it: the cart is used every day from the start of work until the shift ends; it's needed for just about every cleaning task performed; and

very often custodial workers personalize them, customizing and organizing their cart so that it holds the supplies, tools and equipment they need most frequently.

Since carts are a key member of your cleaning family, administrators should know a few more things about them. For instance, a well-organized and properly designed cart can make the custodian's job easier, safer, more effective and more productive. And for administrators specifically, improving worker productivity often means "money in the bank." It means more work gets done per shift and opens the door for janitorial workers to do more cleaning tasks, including those that may get put aside due to their heavy cleaning schedule.

These benefits are accomplished by selecting more ergonomically designed janitorial carts. This means the equipment adjusts to the worker instead of the worker adjusting to the equipment.

Ergonomically designed equipment also helps reduce physical stress and prevent work-related injuries. What is also significant is that an ergonomically designed cart works with the cleaning worker, rather than requiring the cleaning worker to work with the cart.

Ergonomically designed carts are also quieter, more sanitary, sleeker and more professional looking. And they are often better looking too. Aesthetically pleasing janitorial carts are morale boosters and make the cleaning worker feel more important and professional, all of which leads to a happier, more productive worker.

INTRODUCING THE MOBILE WORKSTATION

Just so we are clear about a janitorial cart's importance, let's list some of the tools and

equipment a custodial worker might include in their rolling office when cleaning an airport or other large facility. The cart would likely include such items as:

- A trash collection container
- Plastic bags for trash
- Vacuum cleaner
- Warning signs (e.g., “Wet Floor”)
- Chemical containers and/or a variety of spray bottles
- Dispenser refill items such as paper products and soap
- Feather duster
- Broom, dust mop and dustpan
- Brushes and towels
- Gloves and goggles

Now imagine if a cleaning worker had to visit the janitorial closet of an airport every time he or she needed one of these items. That could result in a lot of walking and when workers are walking, they are not cleaning. Or, what if workers just stored these supplies along gates and corridors and moved them from place to place as they need them? Besides being inefficient, this arrangement would result in a variety of problems, starting with a number of safety concerns for the public.

As you can easily see, a well-designed janitorial cart that can store all of these items, making them readily available when and where the worker needs them, is vital for workers to perform their jobs efficiently and effectively.

This is why some administrators and custodial workers no longer even refer to their rolling office as “janitorial carts.” Now in the professional cleaning industry, the term “mobile workstation” is often used and when you think about it, that is exactly what they are.

FINDING THE PERFECT FIT

What should airport administrators and custodial workers look for when selecting a janitorial cart? The task is not easy. Many manufacturers make janitorial carts and they can vary considerably.

However, the following are some of the key features to look for:

- Quiet: Look for a cart with rubber wheels; rubber wheels are durable and quiet, so they can be used in carrier lounges without causing a disturbance.
- Textured, rounded front end: The front of the cart should be rounded so that it can



Keeping cleaning products with staff allows them to clean areas quicker than going back to a supply closet repeatedly.
Impact Products LLC.

securely hold a trash can or mop bucket. A rounded edge also helps protect walls.

- Zippered vinyl refuse bag: A relative newcomer, a zippered refuse bag has two advantages. One, it allows the worker to remove the trash from the side of the bag rather than lifting it up and over the cart. This reduces stress on the worker's back and arms. And two, it hides trash, minimizing odors while also looking much more appealing.
- Moisture block: Look for a cart that clearly separates wet and dry areas of the cart; this protects cleaning chemicals and other moisture from coming into contact with electrical items such as vacuum cleaners.
- Utility hooks: These are for carrying warning signs, as referenced earlier.
- Molded-in, deep pockets: It's best to select a cart in which the pockets are actually molded into the cart. This more securely stores such items as chemicals, brooms, and other supplies.
- Handles away from trash: It's much more sanitary for the cleaning worker to have the handles be at a distance from the collected trash.
- Molded-in area for a vacuum cleaner: Many carts do not have provisions for carrying an

upright vacuum cleaner. The cleaning worker should have every tool needed or possibly needed on the cart. Because the vacuum cleaner is the second most important tool a cleaning worker needs — right after the janitorial cart — this is a critical feature of a mobile workstation.

We should also note that for some manufacturers, the traditional color used for janitorial carts — yellow is slowly disappearing. Apparently the change is part of the goal of making janitorial carts more aesthetically pleasing. Darker colors, specifically deep blue, appear to be the preferred choice for today's nifty cleaning worker.



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Partial Runway RECONSTRUCTION

Milling the old asphalt runway structure becomes key.

It was almost as though the \$225 million runway that the Detroit Metropolitan Wayne County Airport (DTW) had added in 2001 was jinxed from the get-go. Expected to last 30 years, Runway 4L/22R had issues arise a mere three years later when cracks and flaws in the concrete required maintenance to restore the smooth landing surface. In fact, other concrete paved surfaces constructed in that time frame in Michigan and beyond had similar problems, as the Detroit Free Press reported.

The problem was identified as alkali-silica reaction, or ASR. ASR causes concrete to expand and crack when exposed to moisture over time.

Explanations on how ASR forms include the

new cement manufacturing standards because of new environmental standards, highly reactive sand and the widespread use of winter deicers on runways and roads.

The Federal Highway Administration

(FHWA) said in one of its fact sheets that ASR is a widespread problem and major cause of concrete deterioration in the lower 48 states and in other countries.

ASR happens when the crushed stone, sand or other materials that make up concrete react with cement paste that has a high level of alkalinity, when moisture is present. The reaction produces a gel, which swells and expands the concrete, leading to cracking and other damage. That damage is compounded as more areas are opened to moisture.

After years of maintenance on the runway, the Wayne County Airport Authority decided it was necessary for a partial runway reconstruction of Runway 4L/22R and associated taxiways. The project called for replacement of the top layer of concrete and a small portion of HMA base under the concrete. The nearly 3½-foot thick structure is built in three layers — 17 inches of concrete, 9 inches of asphalt and 16 inches of crushed stone. The runway is substantial because it is 10,000 feet long and it is where the jumbo jets, such as the Boeing 747 wide-body commercial jet airliner and cargo aircraft land.

The airport authority had allotted a tight 180-day schedule in order to minimize the disruption. DTW is a major international airport in the U.S. and one of the largest air transportation hubs in the country. In terms of aircraft operations Detroit Metro is one of the 10 busiest airfields in North America. Runway 4L-22R is one of four parallel runways and among six total runways at Detroit Metro. To say the Wayne County Airport Authority was nervous about taking a major runway out of service for six months would probably be an understatement.

The complete runway reconstruction project included the asphalt shoulders and Taxiways A and Q. The reconstruction of the associated taxiway system is designed to provide a safe connection for aircraft from the runway to the passenger terminals at the Detroit Metro Airport. In total, the project encompasses 6.5 miles of airfield pavement.

“Basically, what we’re doing is building a runway on the same footprint as the existing runway,” said DTW spokesperson Michael Conway. “We’re not lengthening it, we’re not shortening it, we’re not moving it, we’re rebuilding it in place.”

Ajax Paving Industries Inc., of Troy, Mich.



RUNWAY REPAIRS

was the prime contractor for the project along with Dan's Excavating, Inc., of Utica, Mich., who was responsible for removing the top concrete layer. The key role of milling the old asphalt base under the existing concrete runways and taxiways and ensuring a consistent, accurate grade for a new three-inch lift of HMA went to Lois Kay Contracting, of Saginaw, Mich.

Lois Kay Contracting was established in April of 1980 by Lois Kreager. The company established itself by working on MDOT projects throughout the state. With over 30 years of milling experience, the company has a MDOT pre-qualification rating of \$9 million in the milling classification. The company's milling machine fleet currently includes five Roadtec RX-900e cold planers with 7'2" drums, two Roadtec RX-700e milling machines with 6'6" drums and a variable width 2- to 4-foot Roadtec RX-400e milling machine. Additionally, they own four Wirtgen W 600 DC mills with 2-foot drums.



"We spent the first two weeks of the airport project milling off the 35-foot-wide shoulder on Runway 4L/22R and associated taxiways" stated Ron Coffel, estimator/project manager for

Lois Kay Contracting. "For the entire project we removed 475,000 square yards of asphalt shoulders, base and overlays in addition to 350,000 square yards of 3D profile milling with



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four RX-900e machines running at various locations throughout the site.” Roadtec RX-900e milling machines are equipped with Caterpillar 950 hp (708 kW) engines and are considered heavy-duty, high production machines by the manufacturer.

“I like the RX-900e because it’s the most powerful mill on the market,” Coffel said. “And our three-track machines are more maneuverable, lower in weight, and have less maintenance, than other mills.”

Each of the four mills running on the job had its own three-person crew — a machine operator, supervisor and a ground support person. The milling machines were equipped with 3D machine control that was designed to provide precise cutting depth of the mill to minimize over-cutting. The system uses a 3D design model, a total station and on-machine sensors to mill at a fixed or variable depth, depending on job specifications. The 3D design is displayed to the machine operator showing

areas that are on, above, or below ideal grade. Comparing the actual drum position and slope with the digital design, the machine control system automatically guides the milling drum to cut the ideal depth and slope without string lines or manual adjustments.

The Roadtec RX-900e milling machines feature a maximum 14-inch cutting depth, but for this runway project Lois Kay Contracting was profile milling to depths of 3- to 5-inches. An approximate 200,000 tons of milling was performed by Lois Kay Contracting on the Detroit Runway 4L/22R project.

“We had a couple of challenges with the Detroit Metro runway project,” stated Coffel. “We had a tight timeline that we stayed ahead of and completed our portion of the project ahead of schedule. We were able to do this with our solid high production equipment, and of course, our hard working crews.

“The second challenge... with Michigan weather being as unpredictable as it is, we

needed to hit it hard and have maximum production when the weather was good. We received some rain during the stretch of the project but we worked around it.”

The complete reconstruction of Detroit Metropolitan Wayne County Airport Runway 4L/22R and associated taxiways has been completed. The airport authority is likely sighing relief.

“With our part of the runway rehab done I can look back and be proud that a company of our size could take a controlling role in an important project of this magnitude and scope,” Coffel concluded. “I believe we performed very well on what was easily our largest milling project for the 2016 season.”

For DTW there will likely be renewed confidence that 747 jumbo jets, which carry 416 to 660 passengers, depending on configuration, will be safely landing on its Runway 4L/22R air strip.



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GOING GREEN

Artificial Turf for Tortoise Troubles and More

From wildlife management to visual recognition to FOD control, airports are turning to artificial turf to improve airfield safety and operations.

When hundreds of burrowing gopher tortoises made their home in Orlando Sanford International's runway safety area grass, the unassuming reptiles created a glaring problem for airport operational safety.

The solution? Replace the natural grass with artificial turf.

Gopher tortoises burrowing in close proximity to runways are a safety hazard to airport operations. And because the tortoises are a threatened species, relocating the animals and closing the burrows was a regulated process, as well as extremely time-consuming and costly for the airport. Between 2008 and 2014, the airport excavated over 875 burrows and removed 345 tortoises, costing nearly \$400,000. And once removed, the tortoises typically came back to re-burrow.

The airport entered into an agreement with the FAA Airport Technology Research and Development Branch to conduct and fund the study, which was to measure the effectiveness of aviation turf to mitigate the presence of the burrowing tortoises.

The turtles were carefully removed and the area excavated. The artificial turf system, called AvTurf, was installed on a plot around the runway's blast pad and infilled with sand ballast. Four wildlife cameras ran continuously along the perimeter of artificial turf, which recorded photographs of any movement.

After a year of observation and data collection, no tortoise burrowing was detected in the test area. The FAA study, "Artificial Turf And Gopher Tortoises At Orlando Sanford International Airport," concluded that installing artificial turf in runway and taxiway safety areas can be an effective solution for wildlife control.

WILDLIFE MANAGEMENT AND FEDERAL REGULATIONS

Under federal regulations, airports are required to maintain runway safety areas free of haz-



An artificial turf helipad installed in the British Virgin Islands. Act Global AvTurf Inc.

ardous ruts, humps, or other surface variations. In fact, a number of other airports in the FAA Southern Region have difficulty meeting the regulations due to holes caused by burrowing of gopher tortoises. Gopher tortoises are listed as a threatened species in Florida, and mitigation efforts are heavily regulated, expensive and time-consuming.

"Artificial turf can be used as part of long-term preventative wildlife control strategies, rather than reactive measures to capture and relocate," said Daniel McSwain, general manager of AvTurf.

Aside from tortoises, encounters with wildlife, particularly birds, are a major concern in both the civil aviation and military environments around the world. Globally, wildlife strikes have killed more than 255 people and destroyed over 243 aircraft. This is due to the increase in bird population and the increase in aircraft, especially the quieter, turbofan-powered aircraft.

Strikes increased from 1,851 in 1990 to 11,315 in 2013 with birds involved in 97 percent of those reported. Strikes have decreased over recent time due to wildlife management techniques and practices such as alternative habitat strategies which reduce attraction to airports. One of these techniques is the use of artificial turf.

Approximately 60 percent of bird strike encounters occur during landing, thus efforts have been directed to ensure wildlife control on the airfield. Synthetic aviation turf provides a non-lethal solution to mitigate wildlife and reduce the potential for bird strikes by removing food, water, or shelter near the runways. Eliminating mowing operations also significantly reduces the presence of specific birds such as cattle egrets, which accumulate in large numbers during such operations.

ARTIFICIAL TURF SAFETY SOLUTION

Artificial turf can also help curb critical airfield



Tests for jet blast, load bearing capacity, drainage characteristics, skid resistance, flammability, durability and more are all confirmed by third-party reports.

Act Global AvTurf Inc.

safety issues such as foreign object debris (FOD), erosion and more, while providing a clean, green, and low maintenance surface area.

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WILDLIFEMANAGEMENT

FOD damage is responsible for millions of dollars in damage to aircraft every year. Installing artificial turf on infield islands creates a sterile, static environment, with a consistent and low turf height to help airport operators easily identify and remove FOD. In addition, when areas normally subjected to jet blast are stabilized with a synthetic turf installation, the potential for pavement disaggregation and debris created by erosion is eliminated.

Artificial turf was installed at Detroit Metro Wayne County International Airport (DTW), to address issues of FOD due to jet blast. Static aircraft would power up to transition onto Runway 4R/22L for takeoff and the resulting jet blast propelled FOD onto the runway. This presented a potential safety risk for following aircraft taking off or landing and created delays and lost revenue due to runway closures to remove the debris. While topsoil and hydro seed proved to be a very short-term resolution, since having the artificial turf installed, no FOD has blown on the runway.

VISUAL RECOGNITION

Differentiation between taxiway and runway pavements can be a challenge for pilots and confusion on the flight deck can result when extra wide taxiways appear to be runway width. During low visibility conditions, in rain and fog, or when the sun is low on the horizon, marking can become virtually invisible. Configurations of northwest/southeast runways and taxiways are especially conducive to these conditions and exacerbated by the glare that pilots encounter on approach to landing.

Synthetic turf's ability to enhance conspicuity and emphasize the differentiation of runway and taxiway pavement is outlined in "Identification Techniques to Reduce Confusion Between Taxiways and Adjacent Runways." In the study, four visual aid enhancements were tested at Seattle-Tacoma International Airport and Palm Beach International Airport: an elevated lighted X, artificial turf, omnidirectional runway end identifier lights and an in-pavement

lighted X. Each piece of equipment was placed on the taxiway and was evaluated while making final approaches to the runway. Based on the results, artificial turf was visually recognizable at 5 nautical miles, which is greater than any of the other options identified to assist as visual aids and markings.

DRAINAGE

Laboratory and field drainage tests have been performed with successful results on artificial turf. The artificial turf system allows water to drain through natural percolation and the infill provides a natural filter that can drain up to 60 gallons of water per square foot per hour.

Chicago O'Hare was one of the first airports to consider artificial turf to address drainage issues, as well as erosion and visual delineation problems. Water runoff from heavy rain and melting snow tended to pool around a waterway drain and saturate the soil. Previously, the airport had tried filling the area with concrete between the taxiway and runway, but water continued to pool at the drain without a mechanism to slow the water flow. It was also noted that the concrete diminished the visual distinction between the runway and taxiway.

The airport installed a single-strip turf area on the island between ORD's Taxiways D6 and D7 reaching from the top of the island to the drain. This synthetic turf replaced the majority of the existing eroded and rutted grass, and ORD airport staff noted that it immediately slowed the flow of water, similar to natural grass. Airport maintenance workers stated that there have been no problems with any type of erosion or water pooling at this location and it provided better visual conspicuity over the commonly used method of painting the concrete surface.

Artificial turf helps stabilize runway and taxiway shoulders and prevents the erosion of soil abutting pavement because of jet blast and water run-off. A durable synthetic turf system also provides a surface that will support inadvertent excursions by aircraft and minimize damage to aircraft gear systems.

Installing artificial turf on airport property minimizes the need for equipment or personnel to be in or around runway and taxiway safety areas. Synthetic turf also aids vehicle operators and pilots to maintain situational awareness while moving on the airport surface.



The artificial turf system allows water to drain through natural percolation and the infill provides a natural filter that can drain up to 60 gallons of water per square foot per hour. Act Global AvTurf Inc.

ARFF RESPONSE

Both a Boeing 757 and multiple ARFF emergency service vehicles have traversed artificial turf installations with no signs of displacement or damage. Studies show artificial aviation turf performs well under a variety of environmental conditions. When exposed to jet blast, UV, wind and rain, the turf did not exhibit indications of deterioration and proved resilient to the passage of operational vehicles. Under both wet and dry conditions, the artificial turf did not exhibit detrimental reduced braking during aircraft or vehicle excursions. In addition to the burrowing tortoises, the Orlando Sanford study included high speed braking under wet and dry conditions. The artificial turf did not display any rutting and showed excellent braking conditions.

DESIGN AND TESTING STANDARDS

Improving runway safety is a continual effort for those involved in airside operations. In fact, runway safety is identified as a priority safety issue in the ICAO Safety Report 2015, with runway excursions as one of the top concerns.

The FAA has undertaken several other studies on the use of artificial turf in airport environments, which have produced effective results. According to FAA Advisory Circular 150/5370-15B, artificial turf is identified for “use in areas adjacent to certain airfield pavements as an alternate to natural turf or other surface treatments used to stabilize shoulders and safety areas” and “to mitigate localized erosion problems caused by jet blast, storm water runoff and surface damage caused by vehicles.”

Airside artificial turf systems shall meet a set of criteria and design standards as outlined by the FAA and successfully tested prior to the installation. Tests for jet blast, load bearing capacity, drainage characteristics, skid resistance, flammability, durability and more are all confirmed by third-party reports. Further verification of construction characteristics, such as weight, turf height, turf density, fiber thickness and breaking strength, are carried out via ASTM testing standards.

“After installing artificial turf at airports around the world with the first installation occurring over 15 years ago, it is clear that this is a long term solution to eliminate many of the operational issues that plague airports on a daily basis,” McSwain, said.

Several installation methods can be employed, depending on application, environment, size of installation and its intended use. Glue-down turf applications allow airports to replace painted areas of taxiways or small islands, typically for visual delineation purposes. The artificial turf helps identify non-movement areas and the color won't fade like paint on concrete. Larger synthetic turf applications, such as along the sides of runways, will utilize a prepared base and milling of pavement edge or the installation of a header.



ABOUT THE AUTHOR

Daniel McSwain, Act Global AvTurf Inc.

Daniel McSwain is general manager of Act Global AvTurf Inc. McSwain has almost 20 years of experience in the aviation industry with 12 of those years being spent in the development, testing, and now implementation of artificial turf on airfields around the world.

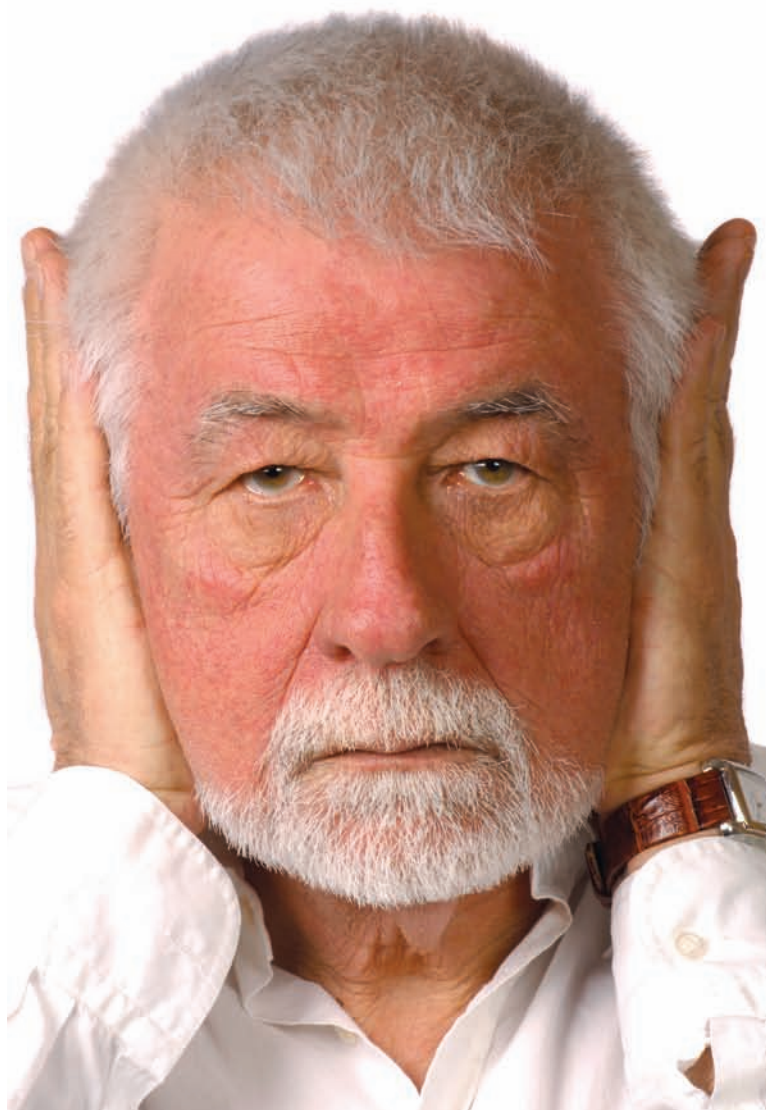


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Aircraft Noise Complaints – New Responses to Annoyance

Taking a new approach to noise complaints can drive new approaches to mitigating issues.

Aircraft noise continues to grab media headlines and the attention of politicians around the world, continuously reminding airport CEOs that community concerns present one of the biggest threats to the future of their airports. Without careful management, they know that noise concerns have the potential to trigger operating restrictions and frustrate expansion plans.

Noise complaints from individuals and community groups are at the sharp end of the issue with airports often handling large numbers of highly charged calls and emails from concerned neighbors. An emerging trend of airports being flooded with emails and app-based complaints is compounding the challenge with many airports struggling to do much more than meet their commitments to record contacts and provide rudimentary reports about the concerns raised. These two dynamics are often doing more to fuel annoyance than to address it.

The importance of effective management of aircraft noise and the challenges in engaging

effectively with the public and complainants are driving new approaches, which are showing exciting results. A rethink on noise complaints is beginning to unlock a deeper understanding that looks likely to play a key role in reducing the threat from aircraft noise concerns through a focus on the central issue of community annoyance. Targeting not just the amount of noise that aviation puts into communities, but also the annoyance that this creates, has the potential to enable the industry to find new ways to better balance the concerns of local residents with the growth necessary to meet the rapidly increasing demand for air travel.

YOUR CALL IS IMPORTANT TO US

For decades, many airports have been committed to operating complaint services, receiving and recording contacts from community members expressing their concerns about the impact of airport operations. What was once focused on telephone calls and hand written letters has migrated online with emails, web forms and now app-based contacts becoming dominant channels.

Back when volumes were manageable, airport staff spent time talking with residents to explain the limitations on the management of air traffic and the limits on being able to deal with the resultant noise. The best of the complaint responses went further by pursuing opportunities for change where this was possible.

In this environment of limited opportunity to improve the level of aircraft noise, some res-



Noise exposure is a major contributor to annoyance, but a growing body of experience shows that there are many other factors at play.

idents pursued an approach of trying to make their concerns more prominent by making large numbers of approaches through the complaint channels.

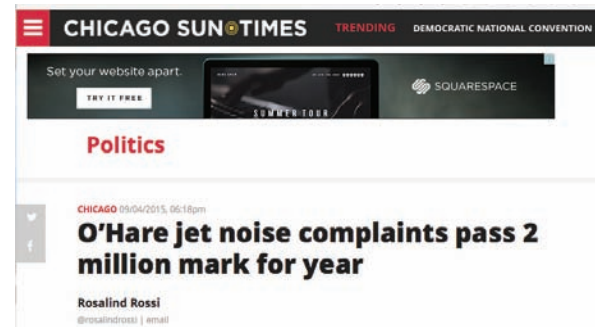
Most airports found that a handful of residents were responsible for the vast majority of contacts and that little, short of imposing a night curfew or even closing the airport, would satisfy them. Infrequent complainers could often be engaged in more rational dialog exploring what could and could not be done to address their concerns.

DOING MORE HARM THAN GOOD?

Airport staff worked hard to build relationships and understand concerns, but often without complaint handling training and without the data systems and expertise to deliver effective responses. Indeed systems and processes often encouraged unhelpful and unproductive engagement. Complaint handlers were often chosen for aviation expertise and often found themselves hampered by an industry vocabulary of aviation and acoustics terms incomprehensible to most.

Arguments about the facts were not uncommon; whether a particular plane had flown directly over a resident's home or whether airspace changes had or had not been implemented. It ran counter to building empathy with annoyed residents when they were told that they were not significantly affected by noise because they lived outside the noise contours or that new aircraft were significantly quieter than previous generations, despite increases in the average size and total number of aircraft. Airport staff would be reluctant to give the hard news; that what a resident wanted was not going to happen, instead leaving unrealistic hope alive and feeding annoyance.

Each month airports diligently reported on complaints, counting total contacts received, the number of people complaining and the communities recording the highest numbers of contacts. Some communities would encourage their neighbors to complain, and some individuals pursued campaigns, to ensure that they reached the top of each month's list in the hope that this would give their concerns highest priority. A perfect storm of major airspace changes and internet complaint channels has seen complaint volumes at some airports exceed 1 million annually.

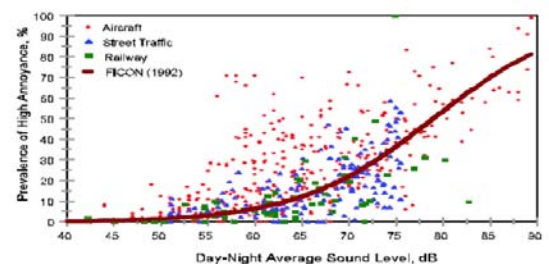


These dynamics have achieved very little, with airports swamped with contacts that tell them very little about the underlying concerns. Many communities remain angry that their complaints were not being acted upon.

THERE'S MORE TO ANNOYANCE THAN JUST NOISE EXPOSURE

These challenges have led an innovative and growing group of thinkers to reconceive airport noise annoyance.

For more than four decades, aviation noise management strategies have been founded on the premise that community annoyance is directly linked to the level of noise exposure. In fact, almost all national aircraft noise legislation can be traced back to the 1978 Schultz study that brought together a wide range of research to describe the relationship between noise exposure and community annoyance.



SCHULTZ CURVE – TRADITIONAL THINKING ON HOW NOISE DRIVES ANNOYANCE

If the Schultz curve fully explained annoyance, we should have seen substantial reductions in community complaints at airports with shrinking noise contours. At London Heathrow, for example, the number of people exposed to more than a 57dB noise level has fallen by over 60 per cent in the last 20 years, however it is hard to argue that community annoyance has reduced.

If explaining disturbances were this simple

NOISEABATEMENT

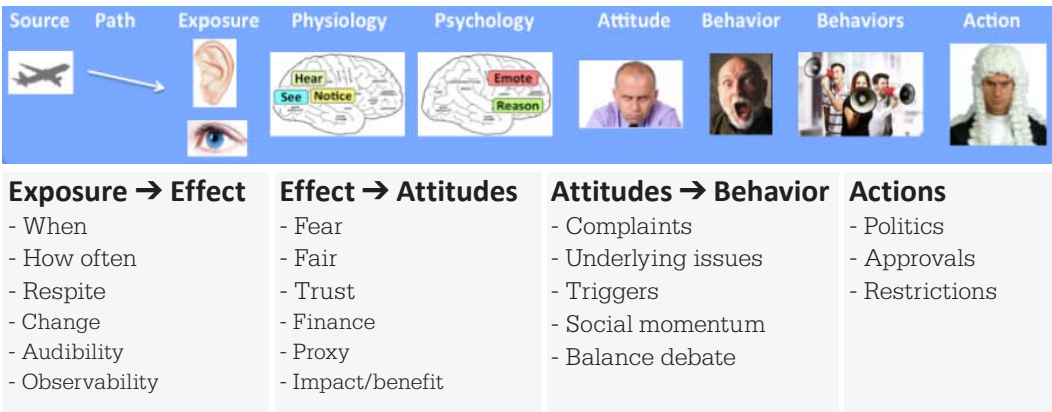
we would expect that small flight path changes would cause little change in annoyance. Unfortunately, this is rarely the case.

It's clear that noise exposure is a major contributor to annoyance, but a growing body of experience shows that there are many other factors at play. Importantly, many of these factors are more amenable to constructive action than is the challenge of reducing the noise exposure.

EVOLVING OUR UNDERSTANDING OF ANNOYANCE

This partial “decoupling” of community annoyance from noise exposure is leading many progressive aviation noise thinkers to carefully examine other factors at play, a field often named “Non-Acoustic Factors.”

While noise exposure remains an important factor, it is clear that annoyance can be significantly influenced by community perceptions of openness, transparency and fairness; whether



stakeholders feel engaged in decision-making processes with their input fairly considered.

Concerns about safety, possible negative health effects and potential impact on children's education along with property price concerns are often found to be significant contributors to annoyance.

ANNOYANCE – UNDERSTANDING EACH LINK IN THE CHAIN

As research into annoyance progresses, more focus is being placed on better understanding the wide range of attitudes across the full spectrum of stakeholders. Traditionally, complaint statistics and the opinions of attendees at pub-



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lic meetings would shape the understanding of community attitudes. These voices are important. However, it is becoming clearer that they only provide insight into the attitudes of a small percentage of the stakeholder world, and often provide a misleading insight at that.

A BETTER APPROACH IS EMERGING

With this new understanding of annoyance emerging, airports are beginning to rethink their approach to complaint handling. What was once a reluctant but mandatory activity is becoming key to providing insights into attitudes and concerns that can better target action plans to reduce annoyance.

Debates about aviation facts are being replaced with a deep respect for the perceptions of each complainer and a thirst to understand what is driving their annoyance. Increasingly a perceived lack of fairness is emerging as a primary annoyance driver resulting from:

- An actual or perceived change in air traffic management
- Perceived breach of rules, particularly a perceived breach not actioned (penalized) according to perceptions of appropriate penalties
- Unfulfilled expectations about peaceful enjoyment of property or promised improvements in the level of aircraft noise
- A lack of understanding of air traffic management constraints, particularly driven by an assumption that there is a better alternative for sharing or moving the noise

In this environment, engagement with complainants focusses on the five “W” questions:

- Who – to identify individuals and communities that hold particular concerns
- Where – the location of the issue and where the complainant lives
- What – the event that triggered the complaint
- Why – the reason it annoyed the complainant

with a focus on impact on the complainant rather than the objective character of the intrusion

- What would the complainant like done about it? This should be presented in a form that encourages realistic ideas.

These insights can then be used to identify potential solutions and tangible actions to address annoyance through four key initiatives:

- Optimizing flight operations within safety and efficiency constraints to minimize annoyance
- Engaging and educating to help minimize inaccurate perceptions
- Engaging and educating to help set realistic expectations
- Say ‘no’ when nothing can be done – to ensure that complainers do not have unrealistic hopes that will never be met

These insights can also drive a change in reporting of complaints and responses. The



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NOISE ABATEMENT

public should have access to a clear picture of the issues that have been raised and responses to those issues. The responses fall into three broad categories:

1. Issues for which a solution has been identified and is being or has been actioned. It is important that the public should be able to monitor progress on solutions being actioned. The community should also be able to identify where partial solutions have been put in place, vital to ensuring that small gains are celebrated and the effort behind them acknowledged.

2. Issues that are under active consideration. The public should have access to a simple process to 'sign on' to such issues, to show the extent of community concern. The public should also be able to monitor progress on possible action.

3. Issues that have been raised but for which there is no viable solution. It is important that these issues should be acknowledged. Information on why there is no viable solution

should be readily accessible in easily understood terms. The message should be clear: that there is no value in pursuing these issues and that individuals need to accept responsibility for dealing with the consequences of the noise in such cases.

Best practice noise complaint reporting now addresses people and issues, rather than the number of contacts received, removing the incentive to make large numbers of repeat contacts about one issue. In Australia, a change in reporting removed any information about repeat contacts, but instead reported the numbers of individuals who had reported an issue. The result was a drop of 80 percent in the number of contacts received.

ULTIMATELY A SOCIAL NEGOTIATION

Ultimately, each society must negotiate its own balance – the point where it decides that the benefits of aviation are in balance with its impacts. To succeed, it is essential that the facts are clear, the debate is informed and that all voices are heard.

Society is well used to the concept of social compacts that accept a level of harm or 'dis-benefit' in return for an overall social benefit. Society accepts the costs of the continuing proliferation of private motor vehicles. In return for the pollution, road safety concerns, traffic noise and traffic crowding that it produces, society takes the convenience and freedom of movement that it delivers. In contrast, the aircraft noise debate is often framed in more absolute and less productive terms. Curfews, movement caps, and restrictions on airport expansion take the place of a debate about the appropriate balance between the costs and benefits of expanding aviation.

Improved engagement with complainants is already shifting the mainstream debate in some communities to ensuring an appropriate balance between the efforts that are being made to reduce aircraft noise and the importance of allowing aviation to grow in response to

consumer demand and social necessity.

THE FUTURE OF COMPLAINT ENGAGEMENT

The industry must strive for a future where legislators and regulators can make better decisions armed with a complete picture of the spectrum of stakeholder opinions, not just those of vocal minorities. Once the complex trade-offs have been weighed up and decisions made, it is key that individuals are then in a position to make well-informed lifestyle decisions.

A constructive debate requires a clear picture of community and individual concerns, a complaints system that can deliver this data, and engagement strategies that encourage productive communication and good information rather than repeat lodgement of contacts and highly technical explanation of aviation practice and aircraft noise. The debate must address all the drivers of annoyance rather than be limited to technically based data on noise levels and numerically based noise contours.

A new approach to complaints is emerging to help turn these goals into reality.



ABOUT THE AUTHORS

Ron Brent is Australia's first Aircraft Noise Ombudsman (ANO), appointed Sept. 1, 2010 and continues in this role today. The role of ANO is to enhance the management of complaints, improve aircraft noise information and develop more effective consultation. Brent also chairs the Australian Research Integrity Committee. Prior to taking up his role as ANO, he was acting commonwealth ombudsman and before that, deputy commonwealth ombudsman for seven years. He also has experience in management and leadership having been director of the National Film and Sound Archive for 10 years. Before that he worked in policy and legal roles in various government departments.

Mike Rikard-Bell was one of four founders of Lochard, the Australian technology company and developer of systems to help airports plan and manage their environmental impact. Lochard joined Brüel & Kjær in 2009 to form the environment management solutions division with systems in over 200 airports globally. B&K's client base reads like a who's who of the industry including Heathrow, Amsterdam, Frankfurt, Chicago, Los Angeles, Sydney, Incheon, Hong Kong & Beijing. Based in B&K's Melbourne office, he is responsible for industry thought leadership and partnering with strategic clients to architect and implement world's best practice in aviation noise management.

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Anchorage paving contractor defies the odds.

They admit it straight out. It is right there on the company home page. They are a heavy construction contractor that “specializes in complex, logistically challenging projects in hard-to-reach places.”

Knik Construction Co. Inc., based in Anchorage, Alaska, appears to thrive on the difficult construction, dredging and paving projects that most would be intimidated to take on. A perfect example is a project they have in Yakutat which is located on that dangle of land that hugs Canada off the southeast corner of the state, also known as the Inside Passage. Yakutat, Alaska, as described by its own chamber of commerce, is “located along



the rugged Alaskan Gulf Coast between Sitka and Cordova. Bounded by the Gulf of Alaska on the South, nearly impenetrable mountains to the North and coastal glaciers to the East and West, Yakutat is about as remote as one can get in Alaska. There are no roads leading into or out of Yakutat. All commerce and access must occur via air or sea."

For Knik Construction, that chamber of commerce description is more alluring than what is found in a travel brochure for the Bahamas. The adrenaline-pumping project that took them to this picturesque village is the Alaska Department of Transportation and Public Funding (ADOT&PF) Yakutat Airport Runway Pavement Rehabilitation project. In Alaska, the state DOT maintains all the airports.

The Yakutat Airport (YAK) is a state owned, public use airport located three nautical miles (6 km) southeast of the central business district of Yakutat. For the approximately 600 residents of Yakutat, this two runway airport is critical. On average, the FAA shows approximately 11,000 YAK airplane boardings annually.

"Our project was the asphalt resurfacing of Runway 11/29, which is 8,136 feet by 194 feet (2,480 x 59 m), plus a 300 foot taxiway," said Amanda Gilliland, P.E., project manager with Knik Construction. "For the project, the runway was divided into three sections—raising the 29 end, which tapered from the existing runway to an elevated 2½ feet, a middle section where the runways intersect, that required varied profile milling, and a final section that needed ½-inch surface milling, which was enough to remove the texture grooves."

The four-month project was a logistical challenge. All the heavy equipment, asphalt plant, supplies and asphalt concrete material had to be shipped via barge, which came to Yakutat once a month. More than 3,000 tons of asphalt concrete material was shipped to Yakutat with each cube of asphalt cement weighing about 27 tons.

Knik started processing aggregate in March 2016 and began work on the runway on May 1, and it was opened up for use at the end of August.

"We needed to carefully plan our shipments, because if anything was forgotten, we were stuck until the next month's barge, or we would need to fly it in," Gilliland stated. "It also meant

that we needed very reliable equipment with maintenance up to date—we wouldn't want to send a truck over on the barge that needs new tires in a week."

Knik had a three-worker milling crew. They used a Roadtec RX900e with 12.5-foot cutting drum. The machine features a Tier 4i Caterpillar C27 950 hp (700 kW) @ 1,800 rpm engine and 14-inch maximum cutting depth. A total of 6,000 tons of millings were removed,



which was mixed with 50 percent D-1 locally-produced aggregate base and reused as fill on the section of the runway that required elevation to alleviate water issues.

"Working in a remote location, it is beneficial to try to reuse immediately rather than stockpile, since the pile could sit for years or longer before it would be used as fill or RAP," said Gilliland. "To ensure accurate milling depth, our cold planer is equipped with GPS machine control."

For the Yakutat Airport runway, Knik shipped over to the remote location a 400 TPH portable double drum Astec asphalt plant, eight belly-dump haul trucks, two 8-ton Blaw-Knox PF4410 tracked pavers, and two Roadtec SB-2500e Shuttle Buggy material transfer vehicles were paired up with the pavers.

There were two paving crews with six workers on each, plus eight locally-hired truck drivers. For the most part, the existing runway served as the base for the paving. The asphalt plant was located near the shipping docks. The haul trucks would collect loads and transport them eight miles to the material transfer vehicles (MTVs) at the runway site.

"Shuttle Buggies worked great – we rarely do any paving without them," Gilliland stated.

"They give us consistency of HMA temperature and ensure against segregation...we've been using them a long time and, quite honestly, couldn't imagine doing any large paving projects without them."

According to Gilliland, the two MTVs kept both pavers productive and in instances where there was not adequate space for the trucks to dump, the belly dump could offload in another area not far from the paving train and the Shuttle Buggy would pick up the pile from there and transport it back to the paver – without having to stop the paver. The Shuttle Buggy has 25 tons (22.7 mt) storage capacity.

The Yakutat Airport project required 62,000 tons of HMA making it the biggest paving project in Alaska for 2016. On a good production day, Knik Construction paved as much as 6,000



tons, leaving the top lift of the runway with very few transverse joints. The company used infrared cameras to shoot the pavement right after it's placed to confirm that there are no temperature variations – cold spots in the mat. Minimal color variation in the infrared image indicates minimal temperature difference in the mix, a result of good remixing.

"The Shuttle Buggy uses a triple auger mixing technology which equalizes temperatures and evenly mixes large and small particles," Gilliland said. "The asphalt spec for the job,

talks about the HMA temperature requirement and the thermal segregation penalty and also the requirement of using a MTV on the job."

It is interesting to see how the ADOT&PF describes the use of MTVs for its YAK – Airport Runway Pavement Rehabilitation project:

401-4.15 MATERIAL TRANSFER DEVICE/VEHICLE (MTD/V).

Direct transfer of asphalt concrete pavement from the hauling equipment to the paving machine will not be allowed during pav-

ing of the top layer. A self-propelled Material Transfer Vehicle equipped with remixing auger(s), (e.g. Roadtec Shuttle Buggy) shall be used to deliver the asphalt concrete pavement from the hauling equipment to the lead paver. The trailing paver shall receive hot mix asphalt from a separate Material Transfer Vehicle, or a Material Transfer Device such as a wind-row pick-up machine. Asphalt concrete pavement placed in irregularly shaped and/or minor areas, such as "elephant ear" tapers, are excluded from this requirement. The MTD/V shall distribute the asphalt concrete pavement on the prepared surface without segregation to obtain a smooth mixture of uniform temperature and texture throughout the finished surface.

With the project completed, Gilliland said, "Even with the numerous rain delays, the challenging logistics getting equipment and supplies, we're proud that we're completing the largest asphalt paving project in the state this year and that we earned quality bonuses for the composition and density of our finished paved surface. This is definitely a unique project that all of us working on will remember for years to come."



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A Family Approach to AVIATION CONSTRUCTION

Centrex Construction wasn't founded in aviation, but a family's passion for flying has built a new-generation of specialty building.

Ryan Flood



W

hen Jimmy Severson was growing up in Oregon, construction was in his background, but it wasn't on his mind.

His dad Jim Severson founded Centrex Construction 40 years ago in the San Fernando Valley in California, then moved it to the Portland, Ore., area in the late 1970s. Though Jimmy Severson was surrounded by construction as a kid, he was bitten by the aviation bug.

"I had a career path set to become a pilot. That's what I dreamed of when I was a kid," he said. "I worked on my private pilot's licenses and I got it on my 16th birthday. I went to college and wanted to design airplanes and do engineering, but I always had construction in the back of my mind."

While Severson eventually got his aviation career off the ground, an opportunity arose to come back and lead his father's company. When he made that decision, it grew a chance to build a unique opportunity in the aviation realm.

Severson said he was working as a pilot for Skywest Airlines when his younger brother contacted him with an opportunity. Their dad was contemplating retirement and they wanted Jimmy to take over the company. While he loved his job, Severson said he quit Skywest after five years of being a pilot and decided it was time to come lead Centrex.

"I loved flying for the airlines, but doing that and having a family can be a bit rough," he said.

When Severson came to the company, he found plenty of aviation connections. While Centrex had done aviation projects amongst others, his dad had worked on getting a pilot's license, his brother-in-law Steve Leasure was joining the company and had worked as an engineer at Boeing, and his brother Tom Severson also pursued a pilot's license for some time.

"He was one of my first students when I was a flight instructor," Jimmy Severson said. "I got him through his solo, but after that he had decided it just wasn't for him."

The trio took over the company in 2008 when the Great Recession was taking hold. Work was light, but there were a few hangar jobs available at the time. But given each of them had experience in aviation, it gave them a chance to show clients they were hiring a competent company during the hardest economic time of the century.

"Frankly, we understand both sides of the equation from the end-user and the construction side," Jimmy Severson

said. "I think our clients see a lot of value in that."

Leasure, who is currently vice president of planning and estimating for Centrex, began working at the company while in college before he got a job as a design engineer at Boeing at its Everett, Wash., facility.

"I worked there for about five years and I actually got to work on the Dreamliner project," he said. "I got hired a few months after they launched the A77 project, so I got to see it from the ground up. "It really developed my love for aviation and for aircraft, just how pure flight is in its

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design. Really having a passion for aviation and being involved with the Severson's, who owned aircraft, it was a match made in heaven."

A DIFFERENT EYE FOR BUILDING

With their background in aviation, Jimmy Severson said they work with clients to make sure they're building not just for their needs, but for the future. When working on a hangar for Helicopter Transport Services at the Aurora State Airport in Aurora, Ore., he said they not only looked at the current needs of the company but how they planned to expand in future needs to make sure there was door width and height available to accommodate bigger aircraft.

fab shops, but you never get to see the whole lifecycle process," Leasure said. "I wanted to be involved in that complete lifecycle process, from that initial concept of an idea in that owner's head, to the completion of the project and even the maintenance of the project."

With the background in aviation Leasure said they have, it gives him a level of respect when coming to meet with clients about projects.

"When you understand the aircraft, small and big, and just the level of attention and detail those machines have, the owners of those machines typically want that same level of attention to detail," he said.

Centrex worked on the new Signature Aviation facility at Portland International Airport

house and have dinner, then it's something not worth doing."

Tom Severson said he always had a mechanical background growing up and initially started college at Cal Poly in San Luis Obispo, Calif. in the hopes of becoming an aerospace engineer. Despite the love for aviation, he said he decided to change to a business administration major when he thought about a future career.

"I like to rub shoulders and talk with a lot of people," he said. "I had this dark vision of working on missile telemetry systems in a concrete vault underground. Even though I could get trained to do something else, I decided to go with something a little more broad."

Tom Severson said while in California he also worked with a roommate to develop a software system similar to Mint. However, when his dad started to toy with the idea of retirement, he knew he wanted to try and take over the business.

His dad agreed to give him a three-year window to prove himself and during that time approached Jimmy about coming to work with the company.

"That three years quickly turned into five years, then six, then seven and we kept rolling," Tom Severson said.

Coming into the business right when the Great Recession hit, Tom Severson said the trio got to "fall flat on our face," right out of the gate, but their dad continued to support them through the economic downturn, assuring them as long as they kept their heads down and focused on work, they would pull through.

"The way we know the industry, we're around it and the whole company is so deep in aviation that there's a passion for aviation and for what it has done for mankind, what it continues to do and it lights a fire that gives us depth when talking with clients," Tom Severson said.

Tom Severson said Centrex strives for employees who work hard, but are not involved in the typical construction culture in order to make them more focused and to show their appreciation for what they do. When they do company retreats, often times the employees will ride with one of the Severson's on a small aircraft. Some have never been in an airplane before but have gotten the same passion for aviation.

"They're not sitting in the back of a 757," he said. "They're sitting up front in a Pilatus or Centurion."



Ryan Flood

"Concrete slab thickness is another example," Jimmy Severson said. "Just through experience, we know that certain aircraft have point loads that need a certain concrete thickness, so we make sure it's set up for their 10-year plan rather than just what they're currently running."

"Replacing a concrete slab is harder to change out than a door."

"What really got me to come back to Centrex was that working at Boeing was an awesome career, but as a designer, you see a lot of designs come across your desk that you send out to the

(PDX). Leasure said the company's facility is right next to where Icelandair overnights its aircraft and employees of Centrex are so passionate about the industry they will even walk the ramp to check for FOD.

"Being a family business, it raised a lot of eyebrows at first because people said it wouldn't work," Leasure said. "It's one of those things that when we were getting going early on my brothers in law and my father-in-law, we all came together early on and looked at each other and said that if we can't at the end of the day go to each other's

Once It's Gone, It's Gone:

How to Protect Your Hearing on the Job

Airside workers need to take proper hearing protection into consideration when on the jobs.

Exposure to environmental noise is one of the leading causes of hearing loss throughout the world, with approximately 30 million workers exposed to hazardous levels of noise on the job. Every day we are flooded with transport, industrial and recreational noises. This constant exposure wears down the delicate nerve hairs in the inner ear in the same way bristles on a toothbrush wear down over time.

That damage is irreparable. When it comes to hearing, once it's gone, it's gone. So how can we protect our hearing and preserve it, regardless of environmental noise?

To best understand what damaging noise is, we need to talk about decibels (dB), or the way we measure sound intensity. On one end, 0 dB is barely audible sound. A normal conversation hovers around 55-65 dB. From there, we move into the higher — and more dangerous — ranges.

Highway traffic typically measures at around 75 dB, while something as simple as a hairdryer accounts for 85 dB. A lawnmower garners 95 dB. Construction sites, as you can imagine, often creep up over 100dB on a regular basis. Jet engines — the most consistent source of environmental noise for airport workers — frequently register at 140 decibels.

How loud is too loud? Anyone exposed to levels at or over 85 dB, particularly on a regular basis or over a prolonged period of time, is at a high risk of hearing loss. Without proper hearing protection, running a chainsaw for

just 15 minutes can cause permanent damage. Obviously, consistent exposure to the noise produced by jet engines on a daily basis puts airport workers in serious jeopardy of hearing loss.

Considering over 10 million Americans suffer from noise-related permanent hearing loss, this is a problem that demands attention, not to mention more preventative measures.

The FAA has been trying to improve noise control for decades, and continues to develop quieter aircraft and enhanced flight control measures. Someday, there may be jet engines that operate at the same decibel level as a car engine. Until then, however, airport employees must take more immediate steps to protect themselves.

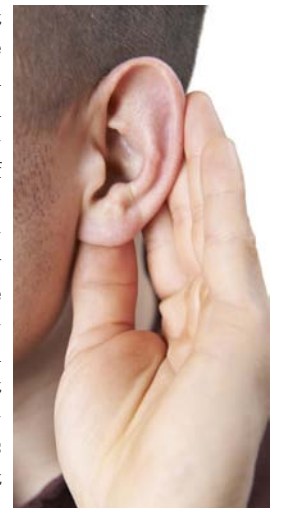
Fortunately, the solution is not complicated. Hearing loss can be prevented by wearing good quality noise protection.

If you are an airport worker exposed to hazardous levels of noise on the job, hearing loss is likely already happening. While you can't always control the noise, you can control how you protect yourself. Protective ear buds

or earmuffs that provide adequate Noise Reduction Rating (NRR) can block out a significant percentage of damaging noise.

When shopping for hearing protection, be sure to look for audiologist-recommended products. The best hearing loss prevention products will protect against hearing loss, tinnitus, and the daily stress of excessive noise by dampening loud vibrations before they can damage your hearing. By blocking out such a large amount of environmental noise, using earbuds or ear muffs allow you to keep music and conversations to safe, hearing-preserving level.

We've all heard the old adage that an ounce of prevention is worth a pound of cure. One place where that is certainly the case is with hearing protection. Don't take your hearing for granted; keep it protected and safe for years to come.



ABOUT THE AUTHOR

Tom Buske, ToughTested

Tom Buske is a leading brand management professional for ToughTested, a subsidiary of Mizco, International. As VP of Branding and Strategy, Buske leads the marketing and brand development for the rugged brand, assisting with new products, marketing initiatives, and competitor research.

MARTY ST. GEORGE

Executive Vice President – Commercial & Planning JetBlue Airways



Marty St. George was promoted to executive vice president – commercial & planning for New York-based JetBlue Airways in February 2015. In that job, he is responsible for airline and network planning, marketing, sales and revenue. He previously served as the airline's senior vice president - commercial.

St. George joined JetBlue in July 2006, serving in roles including senior vice president of marketing and commercial strategy and vice president of planning. Before coming to JetBlue, he was managing director and director of network planning at United Airlines. He also served as senior director of marketing and director of route planning at US Airways.

St. George spoke to *Airport Business* about growth in its focus cities, partnering with new and existing airports, the move back into Atlanta and its Caribbean network.

AIRPORT BUSINESS: During your investor day talk in December 2016, there was a slide that illustrated the 2007-2017 available seat miles in JetBlue's focus cities. Numbers for Long Beach, Los Angeles, JFK and San Juan had gone down but Boston, Fort Lauderdale and Orlando were up. **HOW DO YOU EXPLAIN THESE CHANGES?**

MARTY ST. GEORGE: I don't think any have



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actually shrunk. This company has almost doubled its size, so I think the real answer is that the growth has been concentrated. But there's growth in each market, which is not showing up in market destinations.

AB: WHEN YOU'RE LOOKING AT A NEW CITY OR AN AIRPORT IS TRYING TO GET JETBLUE TO COME WHAT ARE SOME OF THE BOXES THAT YOU CHECK OFF?

MS: We are at 100 cities right now, so we know the new city process pretty well. We have a very deliberate process where we do a lot of research on our own. We look at market size and if the market has been growing or shrinking. Pricing is also very important. We want to see a good business-leisure mix that we can stimulate by cutting prices. When we see a city really coming into its own, that's when we have conversations with the service development people or airport directors.

We're in constant contact with between

16 and 20 cities that are trying to put themselves into the bullpen as the next place we go. We build those relationships over time. When we get down to the short list — and we're thinking next year it may be four cities — that's where we really kick into our local outreach. That includes things like visiting the cities, talking to large corporations and looking at standard travel patterns.

AB: ONCE YOU'VE DECIDED THAT YOU'RE GOING TO GO IN A CITY, HOW DO YOU WORK WITH AIRPORTS TO ENSURE THAT YOUR INFRASTRUCTURE, MARKETING AND PARTNERSHIP NEEDS ARE MET WHEN IT COMES TO GETTING THE SERVICE OFF THE GROUND AND RUNNING?

MS: One great example of that is Atlanta. Atlanta had been very high on the list for our corporate customers in Boston as far as where they'd like us to go next. But Atlanta, as big

as the airport is, has significant gate challenges. We've been working with the city for years trying to find a gate solution that works for us. The original gates offered were ones with hold rooms that fit only 15 or 20 people. We said it's not negotiable. We can't fly 150-seat airplanes in and out of those small gates. JetBlue is about delivering the best service experience of any airline in North America and we couldn't provide great service out of the gates they wanted to give us. Now we're finally going to be on Concourse E. We don't love it, but it's the best option that we have.

AB: IT'S BEEN 13 YEARS SINCE JETBLUE WAS IN ATLANTA. WHAT MADE YOU DECIDE THAT NOW WAS THE TIME TO RETURN?

MS: As we were thinking of the list of the cities that our corporate clients in Boston wanted, Atlanta was the next on the list. We're very deliberate in trying to make sure that we don't



JetBlue Airways



bite off too many of those challenging markets all at once. So we paced them out with cities like Baltimore, Philadelphia and Cleveland.

In 2016, we did LaGuardia Airport, which was high on our corporate list. It's been fantastic. It did exactly what we've thought it would do. When we entered the market, the walk-up fare was \$443. The walk-up fare right now is \$129. With LaGuardia's strong business mix, we can be profitable with that fare.

AB: JETBLUE'S NUMBERS ON STRUCTURED SAVINGS WILL BE FROM \$55 MILLION TO \$65 MILLION FROM AIRPORTS. HOW WILL THE AIRLINE ACHIEVE THAT?

MS: The best way to achieve that is through

a process of building efficiencies. Take the new lobby at JFK Airport as an example. It's gone to all self-bag tagging. On a peak day you could stand in a 30-minute line to get a tag onto your bag. Now every kiosk can handle it. It's so much faster to get through the lobby and it also require a lot fewer crew members.

Right now we have that in JFK, Fort Lauderdale and San Juan. It's going to be moving across the rest of the system as well.

AB: WHAT'S GOING ON WITH YOUR CARIBBEAN FLYING, ESPECIALLY OUT OF SAN JUAN?

MS: It was big news in 2016 and will be in 2017. We've opened a lot of cities in the Caribbean and we started flights to Cuba. Cuba is unique

in that we can't follow a playbook like we do in other cities. Cuba, in the long term, has incredible business potential for JetBlue, similar to how the Dominican Republic has exploded in the last 20 years.

We have almost every Caribbean island that we're going to be flying to already covered. Now the focus is adding new destinations from the best stations that we're already in. For example, we've been in Aruba for probably 10 years, but we just started service to there from Fort Lauderdale in 2016. We connected the dots.

AB: AIRPORT-WISE, WHAT ARE JETBLUE'S PRIORITIES IN 2017?

MS: We've already talked about growth, but we're also looking at maintaining our partnerships and making sure that service levels in our airports are the way we want them so that passengers are having a good experience before they get in the air.

At Fort Lauderdale, there's been a lot of money spent to fix up Terminals 3 and 4. We've talked about taking Fort Lauderdale up to 140 flights a day and beyond, and we're going to need to do that with some help from the county. They are building a new international wing in Terminal 1 and I think we have the right to use a couple of those gates for our international operations.



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Best Practices in FBO Management: SNOW REMOVAL

Winter weather can be unpredictable, but proper preparations allow your FBO to ride out the storm.

Of the variety of precipitation known to fall from the clouds, there is only one that seems to have an equal number of supporters and detractors: Snow. Predictably, most of the advocates fall in the category of school children hopeful for a snow day or skiers on a mountain seeking fresh powder.

For those aviation businesses that deal with its sometimes crippling effects – airlines, airports and FBOs among them – there is no beauty to snow. Indeed, snow means different things to different FBOs. For those in the upper-half of the country, it may mean customer delays, long days and a new or alternate set of rules for a given operation. For those operating FBOs in Florida for example, snow means a fresh crop of humorous videos of cars sliding down hills, courtesy of The Weather Channel, playing the lobby.

Regardless, as the snow begins to taper off across the country and spring approaches, it's

worth a review of how snow affects FBO operations and to review lessons learned. There is

much for FBOs to consider before, during, and after the wicked white stuff begins to fall.

Preparedness prior to the first flakes falling starts during the waning days of summer, when wise FBOs begin recurrent deicing training, and stock up on other essentials, such as deicing compounds for FBO sidewalks and parking lots, such as rock salt, calcium, magnesium or potassium chloride, or urea among others. Sand, or other non-corrosive compounds should be held in stock for ramp side use only.

Another pre-season suggestion is for FBOs to "...build a good relationship with your airport's maintenance department" says Ross Wheeler, Business Development Manager for Sioux Falls, SD-based Maverick Air Center. In many cases, an airport maintenance division is tasked with not only clearing airport infrastructure of snow such as runways and taxiways, but tenant ramps such as airlines and FBOs. Yet, the priority for that snow removal



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team is exactly that, and FBOs are often the last asphalt on the airport to see the blade of the plow. While relationships may not alter the priority list, Wheeler notes it is no coincidence the plow truck from the airport just happens to show up in the nick of time for a medevac flight ready to depart from the FBO's ramp. Those relationships, sowed in the summer, are reaped in the winter.

In terms of snow removal, FBOs are wise to own or lease a heavy duty pickup truck, Bobcat, or other vehicle in their GSE fleet that may be converted quickly to plow truck with the addition of a blade. While responsibility for snow removal from an FBO's ramp varies from airport to airport, snow removal from parking lots is often within the purview of the FBO. So too, is where that plowed snow is piled up for the winter. For places such as Sioux Falls, snow may fall anytime from October to April, and for three of those months, the average high temperature doesn't get above freezing. That means large piles of snow that don't melt for a very, very long time. While FBOs obviously shouldn't pile snow near the FBO customer entrance, piles of snow shouldn't be very near the airport fence either- for security reasons. Yes, snow piles can get taller than airport fences, making the fence much easier to hop over.

Operationally, snow removal is just one aspect of an FBO's winter operations plan. Ground services affected by snow such as aircraft towing sometimes requires a different approach. The human element must also be considered, including appropriate employee

schedule planning and the personal toll inclement weather can take. On the subject aircraft towing, FBOs will often use chains on tow vehicle tires for additional grip in wintery conditions. Towbarless tractors, such as Lektros, while unmatched for hangar movements, quickly lose their efficacy on snow. Hence, when on open ramp conditions in snow, the old reliable of tug and towbar is the order of the day. However, these tugs have their limits as well, and whenever possible FBOs are wise to maneuver aircraft into position by pulling them with tug and towbar, as opposed to pushing. Notoriously tail-heavy business jets, such as the Cessna Citation X, Falcon 900 and 2000 series, as well as 20 and 30 series Learjet aircraft, are easily jackknifed when towed, and extreme caution should apply when pushing such aircraft on snow. One trick-of-the-trade for towing those 20 and 30 series Learjets on snow is employing the aid of the pilots to simply sit in the cockpit to add weight to the nose.

For employees, snow is one of the harshest weather conditions in which to operate. Like sand at a beach, snow by its nature is able to creep into boots, gloves and any exposed areas and add its own dimension of misery to the already bone-chilling cold. Proper winter weather gear, including parkas, is essential. Face protection, such as knit masks and ski goggles, can also make a difference. And, like extreme heat, extreme cold takes a physical toll and saps energy. Even with proper gear, exposure should be interspersed with sufficient breaks indoors, if only to thaw out.

Finally, operational staffing plans should be considered in advance of a snow storm. For the upper Midwest, six inches of powder is just another day and perhaps no cause for concern. Yet, for areas unaccustomed – Seattle for instance – snow creates difficulty for employees making it to work on time, or at all. Snow staffing plans may include scheduling additional personnel in case some are unable to make it to work due to weather conditions. In more extreme cases where the forecast calls for something approaching snowmageddon, creating on airport accommodations for employees- either at nearby hotels or in sleep rooms at the FBO may be necessary.

Wheeler, who graduated from the University of North Dakota and resides in Sioux Falls, SD, has experienced more harsh winters –and snow- than many care to imagine, let alone experience. Despite the cold though, his warm Midwestern charm comes through as he reflects on the long winters. Says Wheeler, "It makes you really appreciate the summers."



ABOUT THE AUTHOR

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Douglas Wilson is the president and founder of FBO Partners LLC, an aviation consulting firm that provides asset management of hangar facilities for FBOs, and offers specialized consulting in due diligence, contract life-cycle management, and other FBO disciplines. Wilson can be reached at douglas.wilson@fbopartners.com.

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