

# Talk Group

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## Working on the North Slope

—Joe P. Blaschka, Jr., P.E.

ADCOMM has been working with the North Slope Borough to implement a new Borough-wide radio system. Working in Alaska and, in particular, on the North Slope has challenges not found in the lower 48. There are many places in the United States as cold as and maybe even colder than in Alaska, even on the North Slope. So, the temperature is not the major issue as people often think. What are the challenges? Well.....

### Mosquitoes

When it is not frozen, the mosquitoes create significant issues when trying to work. Alaskans jokingly call the mosquito the state bird. When working outdoors in many places, a mosquito net and being completely covered is critical to getting anything done.



### Weather

The weather varies significantly throughout Alaska. Each area has its challenges. The North Slope and Alaska Interior have extreme cold weather in the winter and for several months. This is different than in the lower 48 where there could be cold weather for a few weeks with some warming periods. In the North Slope area, it is generally below freezing from September through May and into early June. This long-term cold results in permafrost in many places. This creates many problems with construction, which I will talk about later. The area around the North Slope is semi-arid because of the small amount of rain/moisture received over the year. Maybe less than 4 inches some years! The area around Anchorage, in the summer, is considered warm-summer Mediterranean continental. South-east Alaska is rain forest with some areas getting 275 inches of rain a year!

The weather can change rapidly resulting in a sudden change in travel plans. It is possible to get stuck in a remote location for several days because the weather changed and all flights are canceled. As a result, one cannot assume because the temperature is above freezing today, it will be tomorrow. On one project, I was almost stuck at a remote site overnight but the weather cleared just minutes before the helicopter pilot had to return to base. Another time, a storm resulted in canceled flights to a major airport and I had an unanticipated overnight stay. The weather requires flexibility!

### Communications

Here in the lower 48, we have become accustomed to cell phone and high-speed data service almost everywhere. In Alaska, there are reasonably good communications at locations served by fiber cables. This includes the large cities and the more urban areas. However, once out in the pucker brush all bets are off. In many remote villages and towns, communications are provided only by satellite links. These have limited bandwidth and have significant latency. There are many places without cell phone coverage, even where people are living. This is changing as more and more small villages are getting cell service. However, the coverage is generally limited just to the village area. One only has to go a couple of miles outside the village and communication stops.

In the North Slope area, the satellite dishes point just a few degrees above the horizon. As shown in Figure 1, dishes have to be placed where there are no obstructions looking south. This can make site placement tricky. There are several satellites that can provide service to northern Alaska. In case one fails and the site must be realigned to another satellite, the view to the south must be clear over a 20- to 30-degree window.

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# Industry News ...

## North Slope

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FIGURE 1. Atqasuk Radio Site

Anytime one goes out into the rural and remote areas, communications will be a factor that must be considered. Even if there is Internet access, it can be very slow (almost like the old dial-up days, if anyone remembers those!). Interactive web applications can be frustrating to use if they work at all.

## Logistics

In many places in Alaska (dare I say most?), logistics is the biggest challenge. We often take for granted just running to the store to get something. Or a spare card or part can be overnighted to our location. Even if working in a remote area in the lower 48, we might have to drive a couple of hours to retrieve a package at the airport but at least it is available. In Barrow, for example, FedEx overnight does not work. The U.S. Post Office has 2-day service, depending on the weather. In the villages, it might take several days for a package to get delivered, depending on how full the planes are and how often they run.

There are many areas with reasonable access much of the year either by sea or by truck. The Dalton Highway goes from Fairbanks to Prudhoe Bay so things can be trucked that far. However, for many remote places, during the winter, air access is the only transportation. On the North Slope, most of the villages are located on the coast so during the summer barges deliver fuel, heavy equipment, and similar supplies that cannot be flown in.

Once the ocean freezes, then air travel is just about the only way.

Air travel to these remote locations does not mean taking a nice widebody jet there with several flights a day. For example, there are a couple of 737 flights per day to Barrow and Prudhoe Bay. However, the remote villages use smaller planes, holding maybe a dozen people and some cargo. The remote villages do not have airport terminals or buildings. The photo (Figure 2) of the runway at Point Lay tells it all! In addition, the airport is often a bit away from the village as shown in Figure 3. Note the temperature there was about -10 degrees F when the photo was taken.

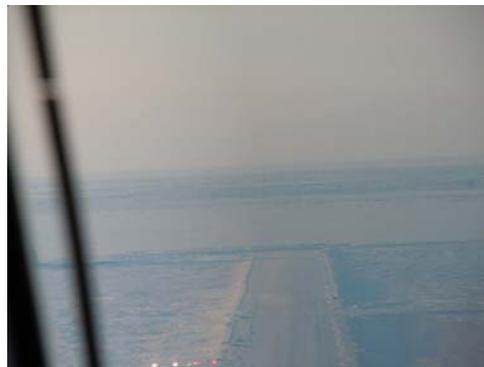


FIGURE 2. View of Point Lay Air Strip



FIGURE 3. View of Point Lay Village from Air Strip

Since air cargo may be the only way to ship things to the remote villages and to Barrow, there are significant size limitations. One of them is length. While an airplane like a 737 can be quite long, the width and the door size limit the length of any item shipped to a bit over 10 feet. No shipping a 20-foot tower section!

A project in a remote village involving several racks of equipment, something heavy like batteries or satellite antenna mounts, might require several plane loads. On top of that is the need for getting a crew to install the equipment. If you forget something, no Lowes or Home Depot close by to run and pick up a few more feet of wire or a few nuts and bolts. Have stuff left over? It has to come back out by air as well. The cost to ship these items can be around \$2 per pound.

One other “minor” issue: in many of the remote villages there are no hotels, restaurants, or grocery stores. One needs to make arrangements for staying overnight someplace, depending on the project, and bringing in your own food. There are solutions to many of these problems but one has to plan ahead. You cannot just fly into town and assume there will be a place to stay or eat!

Unless you are in one of the major cities, logistics has to be one of the most important factors when working in Alaska.

## Construction Issues

This is by no means an exhaustive list of construction issues. However, here are a couple of things to consider. Alaska is generally a place with weather extremes. For example, Fairbanks can have temperatures in the 90s in the summer and temperatures down to -40 or -50 in the winter. This means materials are subjected to a wide range of temperatures, which also means their expansion and contraction will also be extreme. This needs to be considered connecting structures together including coax cables, etc.

Equipment used in construction will have different operating parameters in the summer than in the winter. Oil gets like molasses at those cold temperatures. It is common to see vehicles and equipment left running 24/7 because starting can be an issue when it is that cold. Leaving the equipment running affects the need for oil changes and how long engines last, not to mention the fuel burned.

The other big issue in the northern areas is permafrost. Permafrost is soil or ground

that remains frozen for more than 2 years. In the North Slope area, it is often tundra that is mostly frozen all year round. In the summer, the top couple of feet might thaw but it mostly remains frozen. In many areas the permafrost can be as much as 2,000 feet deep! Permafrost, when frozen is a good foundation, and in many cases things like wood poles can be installed in the permafrost, with water and gravel poured around the base of the pole, which acts almost like concrete after it has frozen.

The problem with permafrost is external heat sources or artificial penetrations into the surface can cause the permafrost to melt. The tundra is like peat moss and has little or no structural strength. This means buildings or shelters improperly installed can melt the permafrost in the immediate area of the building. If this happens the building can have its foundation collapse. One often sees buildings on piers so air can flow underneath the building and there are thermal breaks or barriers between the supports and the building where heat is generated. Figure 4 is one example.



**FIGURE 4.** Proper Shelter Installation on Permafrost

Working in Alaska presents many challenges but they are all surmountable with adequate planning and an adequate budget! In a future newsletter, we will talk about our North Slope radio project.

## Iditarod Experiences

—Peter C. Abraham

The Iditarod is a yearly dog sled race that typically runs from Willow, Alaska, to Nome, Alaska, and spans about 1,000 miles. The race attracts about 75 teams each year (comprised of one musher and 16 dogs), as well as spectators and

volunteers from all over the world. While on “Trail,” teams will travel across some of the most remote and rugged areas of Alaska, in sub-zero temperatures, with winds that can cause the wind chill to easily dip below -50F°. Putting the race on requires the help of several thousand volunteers, including pilots, veterinarians, dog handlers, logistics, trail crew ... and communications.



In 2017, I was able to fulfill a life-long dream and volunteer as a communication operator in “Trail Comms” at Checkpoint

Ruby (a remote village of approximately 150 people by the Yukon River). I spent 7 days in Ruby, from the opening to the closing of the checkpoint.

Getting out to Ruby was an adventure in itself. The travel day starts at 4:30 a.m. with volunteers checking in at hotel headquarters in Anchorage, Alaska. Since I volunteered in Anchorage in 2016, I recognized several familiar faces. About 25 of us were then bussed to Anchorage’s Ted Stevens Airport where we boarded a plane to Galena, one of two hubs along the trail. Galena welcomed us with -30°F temperatures. Our group then split up as we waited for our flight to our respective checkpoints. Some of us waited in airplane hangars while others rode in the back of a pickup truck to a community center, depending on our wait times and final destination. Flights to Ruby (as well as other remote checkpoints) were provided by the “Iditarod Air Force,” volunteer pilots and their personal three-seater aircraft. The IAF transports volunteers, their personal effects as well as last-minute resource needs at the checkpoints ... it all gets stuffed in. During my flight, I had a supply box under my legs serving as an impromptu ottoman and had the insulated engine blanket on top of me ... while wearing my cold-weather gear.

Once we arrived in Ruby and squared away our lodging, the EEK (essential equipment kit) bag was pulled out and communications was set up. For a checkpoint to be considered active, there needs to be at least one veterinarian and one communications volunteer. Communications setup included

email check-in, cell phone verification, and VHF aircraft radio setup. The communication mediums were used to communicate “musher stats,” logistical needs and non-ATC aircraft pickup coordination. Additionally, FRS (family radio service, unlicensed UHF simplex radio) was used for general checkpoint communications and “checkpoint ground” to coordinate the trail-crew teams and veterinarian teams as mushers arrived. During the busy times, there were about 20 teams at the checkpoint with the additional chaos of ongoing arrival and departure of teams; “checkpoint ground” was a valuable resource in the smooth running of the checkpoint. This was my first time having operational dispatcher experience, and compared to what dispatchers and telecommunicators do on a daily basis, I had it easy ... I am even more amazed with the 9-1-1 professionals I deal with.



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**Iditarod**

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It wasn't all work. I met people from the local village and all over the world, including New Zealand, several European countries, and all over the United States; I even met people from the local Seattle area that live less than 5 miles from me. Volunteers were encouraged to enjoy some local sightseeing; walking on the frozen Yukon River at night is an amazing experience. I also got to interact with several of the mushers. Even though they are the rock stars of Alaska, they are very normal, humble, and courteous people. At one point during an early pre-sunrise shift, I was in an exhausted, sleep-deprived state, and while having normal interaction with the mushers I had this

thought: *am I really here, or am I dreaming I am in a Discovery Channel Iditarod special!*

After the last musher leaves, the check point shuts down pretty quick; volunteers are moved farther up the trail or return home. The trail-comms operator is the last person to leave. Volunteers are often notified 30 minutes or less that they are about to leave. Often, I would get the message from an inbound pilot and then scramble to find the passengers: *Inbound flight, 15 minutes out ... you're on it! Grab your gear and make your way to the river; they're not landing on the airstrip because of winds.*

I left Ruby the same way I arrived, on the IAF, helping the pilot stuff the plane with pack-out gear ... but this time I was different ... I am now an Iditarod Trail-Comms veteran.

Many volunteers come back for years ... I plan on being one of them.

More information about the Iditarod race in Alaska can be found at: <http://iditarod.com/>.

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**Check out our website:  
[www.adcommeng.com](http://www.adcommeng.com)**

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