Wheels Up!

Alaska's Rural Air Service

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Tethered to the shore of Upper Twin Lakes in Alaska's Southwest region, a de Havilland Canada DHC-2 Mk1 Beaver awaits its next flight. Such aircraft play a significant—and necessary—role in the state's rural air network, serving passengers as air taxis, recreational transport, and more in remote outreaches where roads are few.

Alaska's extraordinary and remote landscape presents significant transportation challenges because of a lack of roads connecting its rural communities. Instead, the traveling public relies on the state's vast network of more than 230 publicly owned and operated airports and many smaller airstrips. This includes 60 airports with scheduled commercial service, making it the largest aviation network in North America. Rural aviation plays a crucial role in providing access to essential services such as health care, education, and even grocery shopping. It contributes to a unique way of life. In addition to aviation, Alaskan communities utilize all manner of transit, including aircraft equipped with skis and floats, barges, four-wheelers and snow machines, fan boats, and even dogsleds. They also use ice roads and runways. However, aviation is the only year-round method to reliably connect to more than 80 percent of the state's communities. In most states, cities and counties are commonly responsible for airports. However, the State of Alaska is responsible for most of the rural airport system.

State of Alaska's Rural Airport System

Alaska's rural airport system consists of 235 public airports. This count excludes hubs such as Ted Stevens Anchorage International Airport, Lake Hood Seaplane Base, and Fairbanks International Airport, all of which make up the Alaska International Airport System. The rural system has two main operators: The Alaska Department of Transportation and Public Facilities (DOT&PF), which owns, operates, and maintains most rural airport infrastructure, and the air carriers and operators that provide aviation services for all communities on and off the contiguous road system.

Aviation provides essential services that include mail delivery, cargo shipment, and passenger transportation—often referred to as the "three-legged stool." The system depends on federally funded programs such as Bypass Mail and the

Ryan Air Alaska, Wikimedia Commons, CC BY-SA 4.0

A Bobcat takes care of the heavy lifting for a baggage handler, who offloads the last of the cargo from a Ryan Air Alaska CASA C212. Alaska's air network keeps the supply chain moving for residents as well as businesses.

Essential Air Service Program. Bypass Mail provides funding incentives to airlines that deliver parcel post packages to remote communities that otherwise are not economically viable to serve, while the Essential Air Service subsidizes the cost of transporting passengers to designated smaller airports around larger hubs. Together, these programs make it financially feasible for carriers to offer services and routes to remote areas. However, the Rural Service Improvement Act of 2002 (RSIA) recognized that "a class of carriers had developed and focused on mail to the exclusion of passengers and freight. RSIA compared air service in Alaska to a three-legged stool that supports passengers, freight, and mail service. And it recognized that if there was focus by any party on only one leg of the stool, such as mail, the overall stool would be weakened" (*1*).

The current state of rural Alaskan aviation infrastructure is often substandard compared with other systems within the country. This is because of a variety of reasons, such as extensive and diverse landscapes that cover hundreds of miles, difficult access to many places, extreme weather, and lack of sufficient funding for improvements. A 2021 FAA report identified weaknesses throughout the state and offered 11 recommendations to improve the safety of the aviation system (*2*). Researchers found that many areas lack reliable navigational aids and vital information such as current certified weather and cellular service, especially in locations with extreme weather conditions and rough terrain. These factors contribute to Alaska's high aviation accident rate, which makes up 7 percent of all aviation accidents in the United States—despite being home to less than 1 percent of the population (*3*).

The Alaska DOT&PF is responsible for managing and ensuring compliance for rural aviation infrastructure across the state. It oversees airport planning, design and construction, and maintenance of existing infrastructure. It also ensures that airports meet FAA safety standards. This is a huge challenge with the large number of assets and personnel to stay operational, but the department provides opportunities to create resilient infrastructure and build a safer system for everyone involved.

Challenges of Rural Aviation in Alaska

One of the most challenging aspects of managing the largest aviation system in North America is the isolation, remoteness, and extreme weather in many areas. This was recently highlighted by the Aviation Advisory Board's Resolution 2022-2, which supported the state's plan for the Western Alaska Resiliency Study. This study will identify risks and provide recommendations for many airports in western Alaska that are affected by environmental factors such as erosion, permafrost, freeze–thaw cycles, and sea-level rise. For example, the western portion of Alaska faced Typhoon Merbok's extreme wind, rain, and flooding in the fall of 2022. Many communities experienced extensive damage to infrastructure, although most airports sustained the event well and ensured that access remained viable for emergency response. More studies and better technology will be required to combat the effects of weather and the environment, but the high cost of building in remote areas will likely remain.

Funding is also a significant challenge facing all airports in Alaska, which have far more needs than funding available. Alaska DOT&PF must balance the need for maintenance versus system expansion. It must also balance planned and ongoing projects with personnel challenges and a reduced workforce. However, due to safety concerns and required grant assurances, the state more commonly funds projects related to rehabilitation or resurfacing rather than large projects that create additional infrastructure beyond what exists today. The funding challenges are also compounded by the high cost of construction in remote communities. For example, the community of Kongiganak sits along the coast of western Alaska. Like many Alaskan communities—including Juneau, the state capital—it is not connected to the contiguous road system, meaning all access in and out is by air. A capital improvement project is underway that includes resurfacing the runway, taxiway, and apron at Kongiganak Airport. The only way to secure the needed materials and equipment for this—and any—construction project in Kongiganak is to transport them by barge. Gravel for projects like this can cost up to $400 per cubic yard to purchase and deliver, while the average cost of gravel across the state is generally $10–$50 per cubic yard. The resultant cost of reconstruction is prohibitive, so Alaska DOT&PF must often repair and maintain older infrastructure beyond its useful life and until funding is available for replacement. This frequently causes

U.S. Coast Guard

Rushing floodwaters from 2022's Typhoon Merbok wash a building off its foundation and trap it beneath a bridge in Nome, Alaska. Such extreme weather conditions and the damage they bring are among the major factors that can stall the state's aviation system.

Dave Wilson, Aviation Risk Solutions

Bright as a beacon, a yellow building marks Kongiganak Airport—part of an isolated western Alaska community disconnected from the state's main highway system. Water surrounds the nearby village of Kongiganak, just two miles from the Bering Sea. When residents need to venture farther, they head to the outdoor airport terminal and catch a flight.

frustration statewide, as economic development–related projects are often shelved as the rehabilitations and safety needs take priority and receive funding first. This results in a cycle where communities must rely on federal dollars to make repairs rather than build a self-sufficient airport that can generate income.

Benefits of Alaska's Rural Aviation

Air transportation is essential for rural communities in Alaska, with more than 80 percent of communities disconnected from roads. The Alaska Aviation System Plan summarizes this point: "While many villages have clinics, there are few hospitals and trauma centers. Residents also travel by air for routine medical care, often traveling to larger hub cities to see general physicians, dentists, or specialists" (*4*). Logistics and maintenance are crucial issues, but community vitality is an equally important though less tangible policy goal that contributes to fostering rural communities.

Additionally, rural aviation supports economic development opportunities in areas that otherwise would have none. Jobs ranging from equipment operators to rural contractors and tourism professionals are created in these systematically divested communities. Airports provide access to subsistence resources, such as hunting and fishing grounds, as well as to national parks and the remote outdoors (*4*).

Further, airport infrastructure in rural Alaska has proved more resilient in extreme conditions than traditional road and rail networks. This is especially true for infrastructure with well-designed and constructed runways. In many cases, the first response to disaster events in a community is via airplane.

Conclusions

Rural aviation in Alaska is critical for providing access to essential services and supporting the state's mostly rural way of life. However, current airport infrastructure is not where it needs to be, and there are significant challenges to its continuous operation and maintenance. As the state's geographical environment calls for Alaska DOT&PF to be not only resilient but also creative in problem solving, there is hope in future developments and improvements in its airport infrastructure.

REFERENCES

1. U.S. Congress, Senate, Committee on Commerce, Science, and Transportation. Field Hearing Before the Committee on Commerce, Science, and Transportation, U.S. Senate, 109th Congress, 1st Session, September 22, 2005. https://www.govinfo.gov/content/pkg/CHRG-109shrg23709/html/CHRG-109shrg23709.htm.
2. FAA. *FAA Alaska Aviation Safety Initiative: FY21 Final Report*. U.S. Department of Transportation, 2021. https://www.faa.gov/sites/faa.gov/files/2021-10/FAA%20Alaska%20Safety%20Initiative%20Report%20-%20final.pdf.
3. National Transportation Safety Board. CAROL Query. https://data.ntsb.gov/carol-main-public/query-builder?month=12&year=2022.
4. Northern Economics, and CDM Smith. *The Economic Contribution of the Aviation Industry to Alaska's Economy: A Component of the Alaska Aviation System Plan*. 2019. https://www.alaskaasp.com/media/3205/contribution_of_the_aviation_industry_rural_system_report_final.pdf.