TECHNICAL MEMORANDUM

TO: Jodi Gould, AIAS Planning Manager, Alaska DOT&PF

FROM: Erica Jensen, Senior Project Manager, DOWL

DATE: April 11, 2025

PROJECT: AIAS Winter Storm Efficiency Study – Task 3, Inventory Assessment and Analysis

TASK 3 – INVENTORY ASSESSMENT AND ANALYSIS

SUMMARY STATEMENT

Findings of the Inventory Assessment and Analysis of resources for Task 3 indicate both Ted Stevens Anchorage International Airport (ANC) and Fairbanks International Airport (FAI) are generally functioning efficiently and effectively, with talented and dedicated staff to serve customers and support aircraft operations during both normal operations and severe winter events.

Primary Recommendations:

- **Add remote cargo aircraft parking at ANC.** This is the single-most important improvement to increase efficiency at AIAS during winter storms.
- **Increase compensation for equipment operators.** DOWL recommends that DOT&PF identify opportunities to increase compensation for equipment operators to attract and retain qualified and experienced personnel.

Other recommendations provided herein address minor improvements or procedural changes that will further enhance efficient, effective, and safe operations. Recommendations are denoted by bold blue font.

INTRODUCTION

Severe winter storm events occurred in winter 2023-2024 that strained the ability of ANC and FAI to provide efficient movement of aircraft. A January 2024 incident caused extensive delays for cargo carriers at ANC resulting in diversion of aircraft to FAI. Extremely cold temperatures during the diversion period at FAI contributed to additional delays in servicing diverted aircraft.

The January 2024 storm event prompted the Alaska International Airport System (AIAS) to commission a Winter Storm Efficiency Study (WSES or Study) for ANC and FAI to identify ways to improve efficiency and effectiveness of airport procedures during winter storms. DOWL, LLC (DOWL) was awarded the contract with subcontractors Landrum and Brown, Inc. and Ricondo and Associate, Inc. (Ricondo). The Study is comprised of eight tasks and each company was responsible for specific tasks. This technical memorandum addresses Task 3, Inventory Assessment and Analysis, performed DOWL.

DOWL's scope of work for Task 3 was to inventory the resources specific to Airfield Maintenance and Airfield Operations and analyze the suitability of resources in quantity, type, and condition. DOWL's scope included providing recommendations for actions that can improve the efficiency, effectiveness, and safety of Maintenance and Operations.

Resources inventoried and analyzed for Task 3:

- Airport materials and equipment
- Airport staffing
- Ground handlers and deicers
- Snow storage
- Airport-administered cargo aircraft parking.

DOWL collected data from October 2024 through January 2025 including interviews with airport personnel and relevant stakeholders, benchmark data from other airports, and reviews of AIAS-provided documentation. Also evaluated were regulatory guidance and industry standards studies[1]. The subsequent analysis was conducted using these data, common airport standards, and industry best practices. Benchmarked airports included Minneapolis-St. Paul (MSP), Detroit (DTW), Denver (DEN), Salt Lake City (SLC), and Baltimore (BWI).

AIRPORT MATERIALS AND EQUIPMENT ASSESSMENT

Airfield Maintenance and Airport Operations personnel require a wide assortment of tools, equipment, and consumable materials to perform their daily tasks as well as respond to winter weather events.

Snow Removal Equipment

DOWL inventoried and analyzed the snow removal equipment (SRE) listed in each airport's Airport Certification Manual (ACM) Snow and Ice Control Plan (SICP). The analysis addressed equipment used during and after a storm event to move snow, deice the airfield, and distribute traction agent (e.g., sand). The discussions below address the inventory assessment and analysis findings and provide suggested recommendations for improvements if needed.

SRE Equipment Quantity

Based on interviews with senior Maintenance staff, both airports have sufficient SRE to handle routine to extreme winter weather events. There is also sufficient equipment to ensure adequate snow removal and ice control even when some equipment is out of service for repair and maintenance. SRE maintenance is scheduled during the summer months, when possible.

[1] National Academies of Sciences, Engineering, and Medicine. 2015. A guidebook for Winter Operations. Washington, DC: The National Academies Press. https://doi.org/10.17226/22221

SRE Age and Working Order

Based on interviews with senior Maintenance staff, both airports SRE equipment is in good working order. The average age of the most common SRE was benchmarked against equipment age at four other airports with sizeable SRE fleets (Table 1). Benchmarking considered graders or plows, loaders, blowers, brooms, and multi-function equipment. In comparison with the benchmark airports, ANC has the newest equipment, with an average age of 6.0 years. FAI equipment is slightly older, with an average age of 7.1 years. Average age of equipment at both airports falls below the overall average age of 10.0 years for all equipment when considering all benchmarked airports. However, the equipment at AIAS likely experiences increased hours used per year due to the harsher climate in Alaska compared to the benchmarked airports.

The Federal Aviation Administration (FAA) *Airport Improvement Program Handbook* specifies a minimum 10-year life expectancy for SRE. **Recommendation: Both ANC and FAI should continue to replace SRE as frequently as possible in accordance with Department of Transportation and Public Facilities (DOT&PF) and FAA guidelines.**

Table 1: Age of Snow Removal Equipment by Airport

Airport	Loader	Blower	Broom	Grader or Plow[1]	Multi-Function Machine	Average Age All Equipment (years)
ANC	5.2	5.7	--	11.8	3.9	6.0
FAI	2.0	5.0	8.5	10.0	--	7.1
BWI	17.8	--	6.6	12.5	--	12.0
MSP	0.0	10.6	10.9	4.0	9.9	6.6
SLC	16.1	18.8	12.4	20.7	--	15.7
DTW	15.8	15.1	--	--	11.2	12.4
Average Age[2]	9.5	9.2	9.6	11.8	6.3	10.0

1. BWI did not have graders; plows were substituted in the assessment.
2. Across all studied airports

During execution of Task 3, a concern was raised by FAI Maintenance regarding federal emissions restrictions for SRE. Both drive engines and auxiliary engines are subject to emissions restrictions. A machine component may cause a “fault” that switches the machine operation to “limp mode” with maximum speed of three miles per hour (mph). This restricted operation can create a hazard should SRE go into “limp mode” while on a runway or taxiway, thereby preventing the operator from quickly removing it from the area.

ANC and FAI both have diagnostic software to identify the fault for repair. However, it is common for the same piece of equipment to suffer sequential faults. DOWL recommends tracking these faults to determine how often they occur, specifically noting when equipment goes into “limp mode” while on a runway or taxiway. A waiver to exempt SRE at AIAS (and rural airports) from the required fault-triggered “limp mode” would improve safety. Previous ANC

Maintenance discussions with FAA personnel have not generated any progress toward exemption of SRE. **Recommendation: AIAS should continue discussions with federal lawmakers to obtain a waiver to exempt all airport SRE, at AIAS and rural airports, from compliance with the emissions standards**.

Winter Weather Consumables

DOWL analyzed each airport's supply of winter weather consumables (e.g., deice material, traction agent). Based on discussions with senior Maintenance staff and annual use (Table 2), both airports have sufficient storage and materials available to effectively handle conditions during winter weather events. ANC commonly purchases additional supplies of liquid deice throughout the winter, and there have been no issues obtaining supplies in a timely manner. Resupply takes longer at FAI, with a six- to eight-week lead time for solid deice and two weeks for liquid deice. The most common consumable material stockpiles and storage capacities are listed in Table 2.

Table 2. Winter Weather Consumables Stockpile and Storage Capacity at ANC and FAI

Airport	General Type of Material	Specific Type of Material	Pre-Season Stockpile	Storage Capacity	Annual Use Winter 2023-2024
ANC	Solid Deice	Sodium Formate	2,000 tons	2,000 tons	1,038 tons
FAI		Sodium Formate/ Acetate Blend	44 tons	100+ tons	68.3 tons
ANC	Liquid Deice	E36/Potassium Acetate	218,000 gallons	218,000 gallons	405,784 gal
FAI		E36/Potassium Acetate	35,000 gallons	60,000 gallons	17,250 gal
ANC	Sand	--	4,500 tons	7,000 tons	697 tons
FAI		--	1,000 tons	1,200 tons	578 tons

Operations Vehicles

ANC has sufficient Operations vehicles to accommodate winter storm needs of on-duty Operations staff. Recent changes to FAI staffing have caused a need for one additional Operations vehicle. The additional vehicle would be used by Terminal Operations staff to perform limited airfield duties. **Recommendation: FAI should purchase one additional Operations vehicle, which will primarily be used by Terminal Operations.**

ANC Operations does not have warm storage for Operations vehicles. Without adequate warm storage, Operations vehicles are often left running to allow them to be immediately available during adverse weather conditions. Additionally, snow and ice will accumulate on vehicles with no efficient or timely way to remove it. **Recommendation: Adequate, warm storage facilities should be made available for ANC Operations vehicles to ensure reliable response capabilities during winter storm events.**

Friction Measuring Devices

Airport staff measure the slipperiness of runways and other operational surfaces using an FAA-approved device to determine the coefficient of friction (friction) on the surface. The coefficient of friction is symbolized by the Greek letter “Mu” (or μ). Higher coefficient of friction indicates less slippery surface conditions.

Operations staff measure friction on surfaces at FAI; Maintenance staff performs the measurements at ANC. The coefficient of friction value provides airport staff important information for planning and response:

- Real time data – determines slipperiness of the runway or other operational surfaces at the time Mu is determined.
- Evaluate treatment effectiveness – allows staff to determine if the applied surface treatment has reduced the slipperiness.
- Trend information – readings taken over a period of time will provide trend information to allow airport staff to anticipate future conditions.
- Reporting runway conditions – Mu readings will verify runway conditions are accurately reported using the Notice to Airmen/Air Mission (NOTAM) system.
- Pilot Reports (PIREPs)– Mu readings can be used to verify or counter a pilot braking action report.

There are two separate categories of devices to determine Mu: decelerometers and continuous friction measuring equipment (CFME). Each of these categories of devices has several different brands that have been approved for use by the FAA. Both types of devices are described below.

Decelerometers

Decelerometers measure Mu readings at a specific point on the surface of a runway, taxiway, or ramp. The FAA requires a minimum of nine individual readings for each runway. The average Mu is then calculated for each third of the runway[2]. FAA does not require multiple readings for taxiways or ramps. Decelerometers offer the following benefits:

- Lower maintenance costs than CFME
- ANC and FAI already have decelerometer equipment and trained staff
- Staff taking Mu readings can pause and exit the runway to allow for aircraft operations, then resume measurements.
- Ability to take Mu readings on pavement (such as a stub/intersecting taxiway or ramp) where the surface is too short for CFME readings.

[2] FAA Advisory Circular 150/5200-30d

Continuous Friction Measuring Equipment (CFME)

CFME measures and reports Mu reading for the entire length of a runway, taxiway, or extended ramp. CFME has the following benefits:

- CFME readings are performed in a single continuous reading at 40 mph.
- CFME provides a continuous measurement documenting the slipperiness along the entire surface.
- CFME can be used to evaluate rubber buildup and determine if a runway meets the "Slippery When Wet" conditions.
- CFME is less subjective than decelerometers because decelerometer readings may vary based on the techniques used by personnel performing the test.

FAA Advisory Circular 150/5200-30D recommends using CFME devices, as CFME provides a graphic record of the entire surface, instead of the limited number of point measurements provided by a decelerometer, although both methods are effective under similar contaminant type and depth conditions.

FAI Operations staff currently use decelerometers to measure slipperiness and have reported they have sufficient equipment for existing airport practices. ANC also generally uses decelerometers; however, ANC Maintenance staff use a CFME for periodic evaluations as well as monitoring rubber accumulation. FAI Operations is interested in evaluating the benefits of CFME equipment for use in conjunction with decelerometers. FAI could discuss with ANC the possibility of borrowing their CFME, for a temporary period, to determine if the equipment would be beneficial to FAI's operations.

Technology – Devices and Software

There are several ways technology can increase efficiency and effectiveness during routine daily activities as well winter weather events. Examples of devices and software are described below.

Mobile Tablets

Based on discussions with senior Operations management, ANC and FAI have enough mobile tablets to complete reports and updates from the field. Some of the daily tasks that require access to a computer include performing inspection activities, keeping an Operations Log, and issuing NOTAMs. The use of mobile tablets allows for Operations staff to remain in the field longer by not returning to the office to complete these tasks. The tablets also allow Operations to issue a winter Field Condition NOTAM as soon as the inspection has been completed in the field, thereby notifying pilots with a nearly real-time update of landing conditions. Field Condition NOTAMs provide pilots with essential information they need to perform landing calculations and make accurate landing decisions.

Mobile Internet

While each airport has enough tablets to support the work, internet connectivity is also needed to complete reports and issue NOTAMs from the field. Mobile internet allows Operations to monitor weather, keep track of arrivals and departures, and otherwise perform necessary duties.

FAI's mobile internet network is functional and capable. ANC deployed a mobile connectivity solution using cellular connections in March 2025. In addition, ANC also has a Starlink connection which can support Operations or Incident Command in the event of an emergency.

Software

Software is a vital component to ensuring the airport's ability to both perform necessary duties and track actions taken. Some of the software used is described below.

- ANC: Amadeus Resource Management Software – Used to manage Airport-administered parking spaces and is attached to the Amadeus Air Operations Database which supports modules for accounting and leasing. This system generally works well, but it is not cloud-based and lacks mobility making it very difficult for airlines and ground handlers to independently access the information. *Cost is $9,800 per year.*
- ANC: SureWx – Used by Operations to assist with situational awareness for aircraft deicing. The software provides alternate FAA-approved holdover times (HOTs) based on Liquid Water Equivalency, as opposed to the standard FAA HOT guidelines based on temperature and precipitation. A full analysis of the SureWx software, its use, and its limitations is discussed in the *Assessment of Operational Controls* (provided under separate cover). *Cost is $25,000 per year.*
- FAI: AeroSimple – Cloud-based software that assists the airport with Part 139 compliance. Tasks performed by AeroSimple include documenting daily self-inspections, creating an Operations Log, and Safety Management System tracking. One of the concerns expressed by stakeholders during interviews is that AeroSimple is not intuitive. *AeroSimple costs $25,000 per year.*
- ANC: Passur MobileVue – Used to view aircraft and ground vehicle transponders overlayed on satellite imagery. This software has playback features that can be useful for noise complaints and event debriefs. Passur is cloud-based and accessed using a standard computer. It was reported by stakeholders that the long refresh times make Passur cumbersome. *ANC pays approximately $12,000 per year to maintain this capability.*
- NOTAM Manager – FAA-owned, internet-based software program that is the primary method through which airports enter NOTAMs into the national NOTAM system. To ensure NOTAMs are issued in a timely manner, Operations staff for both FAI and ANC need connectivity to use this system in the field. *This internet-based software is provided free of charge by the FAA.*

Additional software used by ANC Airfield Maintenance to manage winter operations but not evaluated as part of this Study are:

- Airport Safety and Operations Compliance
- Geotab for fleet performance
- Vaisala for pavement temperature
- Wx Horizon for current and future weather conditions
- Tradewinds Tracr for runway condition reporting

Neither FAI Gate Management nor ANC Part 139 Compliance have an effective software solution. Findings and recommendations based on the Study are provided below.

FAI Gate Management – FAI does not currently have gate management software to allow FAI to manage and track diversion events and perform gate scheduling. FAI Operations staff use an Excel spreadsheet for all airport-administered parking, including the South Cargo Ramp, remote spots adjacent to the terminal, and airport-administered terminal gates.

Recommendation: DOWL recommends software options with interactive maps and the capability to track cargo parking. This utility would aid in awareness for diversion events and allow FAI to track which ground handler will be handling which divert. FAI has previously had issues with parking diverted aircraft due to departure times not being visible or accessible. Cloud-based gate management software could allow the ground handler to request a parking spot based on the proposed ground time and provide more efficient scheduling and delay awareness. Potential software options are AeroSimple Gate Management or GoApron.

ANC Part 139 Compliance – ANC is currently performing all required Part 139 tracking using paper (hard-copy, manually written). **Recommendation: DOWL recommends that ANC purchase software to support Part 139 compliance activities and improve efficiency.** This includes, but is not limited to, documenting and tracking all required daily inspections and creating an Operations Log. Ideally, the software would integrate with ANC's current work order system, so when an issue is found by Operations on the airfield, it can be reported to Maintenance for repair. Software capable of tracking important trend information would help identify where Operations and Maintenance might invest additional time and focus.

Except for the specific items or actions recommended above, both ANC and FAI have the tools, equipment, and consumable supplies needed to perform their assigned duties, during day-to-day and winter weather conditions.

AIRPORT STAFFING

Having sufficient qualified, trained personnel to perform the various maintenance and operations duties is essential to being able to effectively serve all airport users.

Airside Maintenance

Equipment operators work in adverse conditions, next to aircraft, and on aircraft landing, taxiing, and parking surfaces where operator error could cause a potentially deadly accident or incident. To effectively perform their duties, equipment operators must work as a team.

Current Staffing

ANC Airside Maintenance performs its duties with both full-time (FT) and seasonal part-time (PT) employees (Table 3.) Equipment operators, foremen, electricians, mechanics, support staff, and leadership comprise the airside maintenance team. Three shifts provide 24/7/365 coverage.

Table 3. ANC Airport Field and Equipment Maintenance Staffing (2025)

Position Type	Total FT Positions	Filled	Vacant	Total PT Positions	Filled	Vacant
Management & Administrative	7	5	2	--	--	--
Foreman	9	6	3	--	--	--
Equipment Operator (Maint Gen)	17	15	2	--	--	--
Equipment Operator (Intl Airport)	31	25	6	19	16	3
Maintenance Specialist Electrician	10	8	2	--	--	--
Mechanic, Automotive, Advanced	15	13	2	--	-	--
Stock Parts Service Lead	2	2	0	--	--	--
TOTAL	***91***	***74***	***17***	***19***	***16***	***3***

FAI Airside Maintenance performs its duties with both FT and seasonal PT employees (Table 4). Equipment operators, foremen, mechanics, support staff, and leadership comprise the airside maintenance team. Two shifts provide day and evening coverage Monday through Friday. When overnight or weekend coverage is needed, employees are called to work overtime.

Table 4. FAI Airport Field and Equipment Maintenance Staffing (2025)

Position Type	Total FT Positions	Filled	Vacant	Total PT Positions	Filled	Vacant
Management and Administrative	2	2	0	--	--	--
Foreman	4	4	0	--	--	--
Equipment Operator (Under Equipment Operator Foreman)	12	12	0	9	3	6
Equipment Operator (Under Mechanic Automotive Foreman)	2	2	0	--	--	--
Maintenance Generalist	1	1	0	--	--	--
Mechanic, Automotive, Advanced	4	4	0	--	-	--
Stock Parts Services	1	1	0	--	--	--
TOTAL	***29***	***29***	***0***	***9***	***3***	***6***

Vacancy and Staff Retention

The “Vacant” columns in Table 3 and Table 4 indicate the shortage of equipment operators and staff, one of the most urgent issues to be addressed. At the time this inventory was analyzed, ANC had a 20 percent vacancy rate. FAI had enough positions to create and operate with a

third shift, but due to vacancies in seasonal positions, a third shift has not been established. The lack of a third shift at FAI requires airfield maintenance crews to work 12-hour shifts during winter storm events, including weekends and holidays, until the airport has been returned to an acceptable condition. Some of the challenges preventing the airports from achieving full staffing are discussed below.

Compensation (Maintenance) – Maintenance leadership indicated one reason for staffing shortages is compensation. Aware of this challenge, Mission Critical Incentive Pay (MCIP) was started by DOT&PF in November 2022 to assist with recruitment and retention. MCIP provided a 30 percent increase in pay of certain Labor Trades and Crafts positions. Vacancy rates decreased immediately after implementing MCIP (**Figure 1**). The initial MCIP expired in June 2024. A new Letter of Agreement for MCIP was signed in November 2024 creating a 10 percent differential on top of normal pay. The State of Alaska's base contract saw an overall increase of about 15 percent; thus a smaller incentive pay was provided due to the overall increase in base pay.

DOT&PF must continue to create ways to be competitive in a challenging labor market. An unpublished 2020 compensation study showed DOT&PF equipment operators received the lowest starting wage of all industries queried. **Recommendation: DOWL recommends that DOT&PF create opportunities to increase compensation for equipment operators to attract and retain necessary talent. Periodic compensation studies should be performed to ensure DOT&PF compensation is keeping pace with the market.**

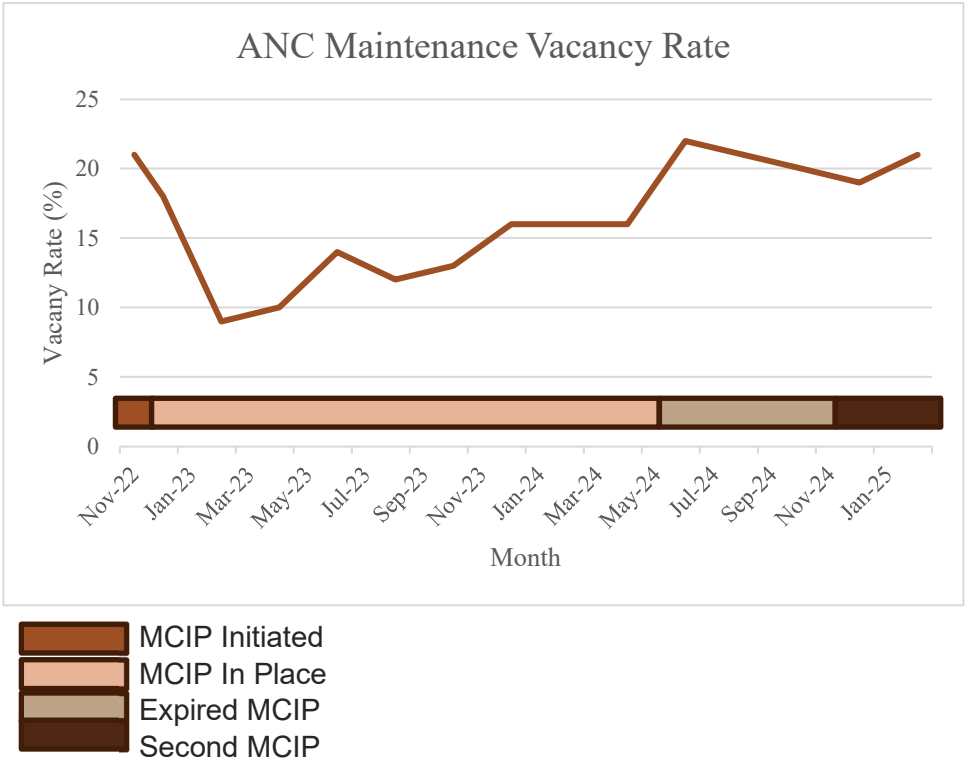

Figure 1. ANC Maintenance Vacancy Rate

Overtime (Maintenance) – Due to the changing workforce, mandatory overtime may be less desirable now than it was previously. An article published by the *Independent* stated that the number of people willing to work overtime decreased from 54 percent to 36 percent between 2020 and 2022.[3] Additionally, a 12-hour-on/12-hour-off shift rotation creates fatigue for equipment operators. It has been shown that fatigue can degrade performance and increase the risk of operator error.

Job Classification and Career Progression (Maintenance) – ANC and FAI maintenance leadership teams are developing a proposal for workforce restructuring to explore opportunities for aligning job classes and introducing tiered structures within the DOT&PF classification system. The goal of the restructuring is to reduce barriers to entry and explore opportunities from which an expanded labor pool may be drawn.

Recommendation: AIAS should continue efforts to:

- **Create international airport-specific equipment operator positions that are unique to the international airport environment.** This would allow the Airport more control over salary range, minimum qualifications, and skills.
- **Create career opportunities for entry-level personnel**, potentially with employees who do not yet have a commercial driver's license.

With existing staffing, ANC and FAI have different tolerances to entry level positions. ANC has sufficient staff and the willingness to train entry-level positions. FAI management would be willing to take on entry-level positions, but only with increased staffing levels. FAI does not have the time or capacity to train entry-level staff at the current staffing levels.

Airport Operations Staff

Airport Operations staff is generally divided into two distinct groups: Airside and Landside. "Landside Operations" includes Terminal Operations and is often referred to as "Terminal Operations" at both ANC and FAI.

ANC Operations

ANC Airside Operations' primary purpose is airfield safety and compliance. Common Airside Operations duties include conducting inspections, issuing NOTAMs, responding to incidents, and providing escorts. ANC Airside Operations is fully staffed with eight operations officers and one supervisor; there is no documented need for additional Airside Operations staff. The Operations officers work eight-hour shifts to staff the positions 24/7/365. The supervisor works an eight-hour day shift Monday through Friday.

[3] Coffey, Helen, January 28, 2024, How Millennials Became the Hardest Working Generation, https://www.independent.co.uk/life-style/millennials-gen-z-boomers-working-hours-compared-b2484624.html#:~:text=Collating%20and%20analysing%20the%20data,54%20to%2036%20per%20cent. Accessed January 29, 2025.

ANC Terminal Operations' primary purpose is the safety, security, and compliance of the landside and terminal areas as well as scheduling airport-administered gates and spots. ANC Terminal Operations is fully staffed with six operations specialists and one supervisor. The operations specialists work in eight-hour shifts to cover 24/7/365. The supervisor works an eight-hour day shift Monday through Friday.

According to ANC Operations leadership, there is sufficient staff to cover routine ANC Terminal Operations duties. However, severe weather events often create more work than a single person performing Gate Management functions can manage and it is necessary to increase staffing to two. The extra staffing is provided by current staff working extra hours. Terminal Operations specialists are not overtime-eligible and are compensated using flex time. Flex time requires time off in lieu of overtime.

Recommendation: AIAS should continue working through the process with the State of Alaska Department of Administration to enable operations specialists to earn overtime. This change will assist senior management with staffing high workload situations for operations specialists.

FAI Operations

Airside Operations' primary purpose is airfield safety and compliance. At FAI, Airside Operations also manages airport-administered parking spots and gates; however, this task will eventually be shifted to Terminal Operations. FAI Airside Operations is currently fully staffed with eight personnel working in 12-hour shift to cover 24/7/365. However, one position will be moving to Terminal Operations, decreasing the total number of Airside Operations officers to seven.

FAI Terminal Operations is currently being established to provide the staff necessary to perform employee screening as required by recent Transportation Security Administration mandates. Terminal Operations' primary purpose is the safety, security, and compliance of the landside and terminal areas. When fully implemented, Terminal Operations will have three officers and one supervisor. FAI anticipates having Terminal Operations staffed approximately 20 hours per day, from 4:00 a.m. to 12:00 a.m. The expected schedule will have staff working 10-hour shifts. FAI Terminal Operations duties will include day-to-day oversight of the Aviation Worker Screening program, managing the merchandise and consumable inspections, terminal gate schedules, light curbside enforcement, terminal inspections, and terminal safety audits.

Career Progression (Operations) – **Recommendation: To support employee recruitment and retention AIAS should develop a career path progression for Operations staff to create a pipeline from entry level to airport leadership positions.** Suggested methods are listed below.

- Create entry-level positions for recent college graduates or military veterans.
- Create leadership positions to prepare for supervisory positions.
- Encourage State of Alaska leadership to hire airport professionals to lead airports in the AIAS system.

AIAS must work within the greater DOT&PF structure when solving staffing issues. DOWL recommendations are intended to provide minor clarifications and support for the actions ANC and FAI have already initiated to resolve these issues.

GROUND HANDLERS AND DEICERS

Ground handlers provide services necessary to support aircraft from landing to departure. Ground handler services include marshalling, loading and unloading, fueling, deicing, and other support services. Ground handlers are essential for efficiently moving aircraft in and out of the airport. DOWL interviewed ground handler companies operating at both FAI and ANC to understand their perspective on winter performance. Companies interviewed were Pegasus (ANC/FAI), Omni (FAI), and IDS (ANC, only performs aircraft deicing).

Airlines may choose to either accomplish ground-handling tasks with internal airline personnel or contracted ground handlers. Contracted ground handlers operate under either a lease or a Business Activity Permit. Most airlines with a large enough presence (e.g., staffing and operations) at an airport (e.g., FedEx and UPS) will perform ground-handling duties with their own staff. Airlines with less operations presence use contracted ground handlers.

Ground handlers are integral to the successful, efficient, and effective operations at AIAS. Facilitating a positive working relationship between the airport personnel and the ground handlers is essential. However, AIAS has no standing in contractual relationships between the airlines and the ground handlers. The airport may influence the activities of ground handlers through the ANC Operations Manual, FAI Operational Orders, leases, and use agreements.

AIAS has recently created a Winter Storm Working Group to enhance collaboration, communication, and relationships between AIAS, ground handlers, and airlines. Interviews with staff and ground handlers indicate positive outcomes from this working group. **Recommendation: DOWL recommends AIAS continuing to enhance relationships, communication, and collaboration through the Winter Storm Working Group.**

SNOW STORAGE

DOWL evaluated snow storage in the AIAS to determine if there are sufficient snow storage areas and if those areas are appropriately placed. Snow that accumulates on operational surfaces at both ANC and FAI must be quickly gathered and stored so aircraft operations may continue with minimal or no interruption. AIAS airports have two types of snow storage areas: short-term and long-term.

A short-term snow storage area is where snow is piled temporarily during an active snow event. Short-term areas are used to store multiple, smaller piles, allowing Maintenance to keep the ramp and parking locations clear by quickly moving snow from the ramp to the nearby short-term areas. After the snow event, snow is gathered and removed from short-term storage areas and moved to long-term storage areas (often remotely located from active operational areas) where it will remain until summer melt.

There is generally adequate short-term snow removal space at both ANC and FAI. However, significant snowfall or back-to-back storms may create temporary snow storage needs that exceed the available space. There are no obvious locations for additional short-term snow storage at either airport. Any new short-term snow storage sites created would reduce aircraft parking availability. **Recommendation: FAI and ANC should each evaluate the feasibility for**

the airport to rent back portions of leaseholds at desirable locations to support short-term snow storage.

There is sufficient long-term snow storage space at both FAI and ANC. However, in recent years, long-term snow storage locations have been diminishing as previously vacant lots have been leased. So far, this has not presented issues. **Recommendation: Long-term snow storage areas should be set aside and protected from other uses to allow for efficient handling and storage of snow.** Additionally, if new operational surfaces are developed, as presented in each airport's Master Plan, this would increase snow removal volume and elevate the need to designate space for snow storage.

An additional method to manage a lack of short-term snow storage availability would be to hire contractors to move the snow from the short-term snow storage locations to the long-term snow storage sites. This would keep the short-term storage sites from expanding beyond their current footprint. However, both FAI and ANC have determined that contracted snow removal support is not needed at this time. This should remain an option for the future and should be considered in airport planning activities.

AIRPORT-ADMINISTERED AIRCRAFT PARKING

Airports must have space for incoming aircraft to park to accommodate passengers, cargo, or service aircraft. Passenger aircraft generally must park at the terminal to allow for efficient enplaning and deplaning of passengers. Passenger airlines with a significant presence at an airport will preferentially or exclusively lease terminal parking space, thereby ensuring their parking capacity. Since a passenger airline controls both the leased gates and the aircraft arrival schedule, they have tools to synchronize the arrival rate with available space to lessen severe congestion for their airline operation.

Cargo carriers may also use leased spaces or airport-administered spaces. FedEx leases ramp space at FAI and ANC. UPS has a dedicated ramp at ANC. The Study focused on ANC airport-administered parking spaces.

Many of the other (non-FedEx or non-UPS) cargo operations at ANC are "technical stops" (tech stops) for international cargo carriers. Tech stops at ANC are generally scheduled stops made for crew change-out or refueling. ANC's ability to efficiently and effectively accommodate these tech stop operations is a core service that ANC relies on for revenue.

To accommodate tech stops, ANC has 14 remote parking spots. Four of the remote spots had a preferential lease agreement for the winter of 2024/2025. During the preferential lease, the spots could not be used by the Airport without prior coordination with the leaseholder. There are eight additional spots at the North Terminal that are prioritized for international and domestic passenger flights, although they can be used for cargo if necessary. One of the eight North Terminal spots is used for short-term snow storage during active winter weather events and another portion is leased to a regional carrier. The remaining spots at the North Terminal can accommodate aircraft up to the size of a Boeing 747-300 without restriction.

During severe winter weather, delays can prevent the timely flow of aircraft through the system. Delays are created by the additional time it takes to deice aircraft, perform ground handling tasks on a contaminated ramp, snow-clearing operations, and other issues created by severe weather. This causes each aircraft to spend longer time at the gate or remote parking spot, slowing down the throughput of aircraft. The greatest delay occurs when weather conditions deteriorate to a point where aircraft cannot depart due to insufficient HOTs. HOT is discussed in the document: *Assessment of Operational Controls,* under separate cover.

During very severe winter weather, all available parking at ANC may be occupied. Once regular parking spots are filled, ANC often must hold or park aircraft on taxiways or taxilanes. Aircraft will continue to assemble on the ground until conditions allow for effective aircraft deicing or, in the case of timed-out crews, the crews have achieved the required crew rest to resume operations. When all available parking spots and space on taxiways and taxilanes have been occupied, incoming aircraft must be placed in holding patterns over the airport to await an opening. If the holding aircraft begins to run low on fuel, they must then divert to another airport. The aircraft departure rate must increase to at least the arrival rate to maintain continuous ANC operations.

ANC is currently at capacity for cargo airline tech stops during periods of high cargo aircraft activity. Winter weather during these periods will almost always trigger delays.
Recommendation: ANC should increase the number of remote parking spots to accommodate more aircraft.

FAI has capacity to accommodate cargo aircraft specifically destined for FAI. FAI is an alternate airport that aircraft intended for ANC can divert to in case of adverse weather or other emergencies at ANC. FAI is essential for enabling ANC to accommodate tech stops by providing an alternate airport. More information and specific recommendations related to additional parking are included in the *Assessment of Operational Controls*, under separate cover.