

Technology and Innovation Improve Aviation Safety in Alaska

Advanced Air Mobility

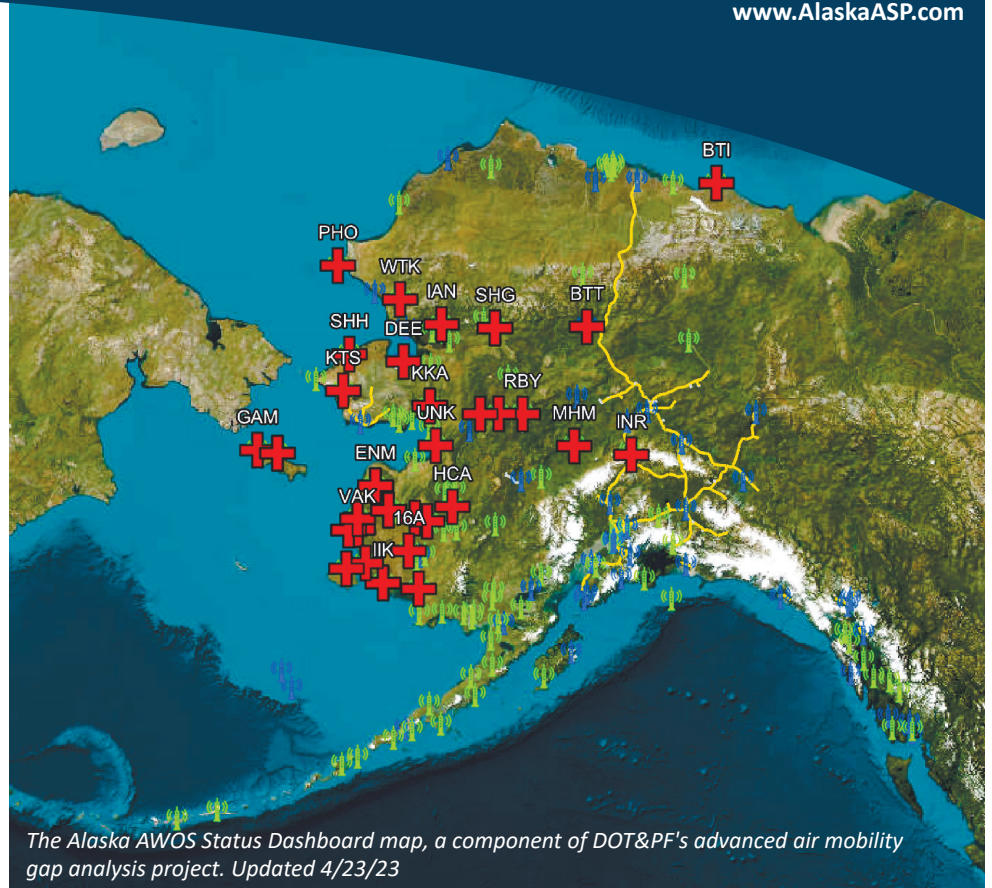
By Greg Dyer, Woolpert

Advanced Air Mobility (AAM) is a term that has been used broadly to include new people-carrying vertical take-off and landing vehicles and uncrewed aircraft systems (UAS). You may have also heard terms such as Regional Air Mobility (RAM), Urban Air Mobility (UAM) and Electric Vertical Take Off and Landing (eVTOL). NASA defines AAM as “an air transportation system that moves people and cargo between places previously not served or underserved by aviation, using revolutionary new aircraft that are only just now becoming possible.” Drones are the most well-known example of AAM.

As part of a methodical approach toward understanding this emerging technology, Alaska Department of Transportation and Public Facilities (DOT&PF) Statewide Aviation initiated a gap analysis to determine missing or needed infrastructure for implementation, contracting with aviation firms Michael Baker International and Woolpert.

The consulting team is gathering input from pilots and air carriers on several services including ADS-B and weather cameras. Scan the QR code to take the survey and assist the team in identifying priorities.

As part of DOT&PF’s statewide transportation and aviation planning functions, this project recognizes the critical nature of aviation infrastructure in Alaska, including everything from radar sites and ADS-B sites to communications facilities and navigation systems. The immediate goal of this project is to consider existing infrastructural shortfalls in the context of ongoing aviation activity in the state. Next, potential AAM will be considered to inform proposed infrastructure enhancements and investment priorities moving forward.



One interesting way to learn about this new industry is the “AAM Reality Index” published online at <https://aamrealityindex.com/>. The index lists many vehicles currently under development and scores them according to their design, timeline to certification, and available funding support.

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AASP Spotlight

Typhoon Merbok Storm Response



Calvin Schaeffer in a vintage vehicle.

When Western Alaska was hit by the remnants of Typhoon Merbok in September 2022, causing historic storm surge and damage, DOT&PF personnel answered the call to assist with clean-ups and infrastructure repairs. The M&O team spearheading on-the-ground response efforts in the Nome area is led by Calvin Schaeffer, Northern Region's Western District M&O Superintendent. Calvin started working for the State in 1995 as an equipment operator in Kotzebue. Eventually he became the Airport Manager in Kotzebue and then transferred into the Nome-based Superintendent role in 2017. Now he manages four hub airports and highway crews in Nome, Kotzebue, Unalakleet, and Saint Mary's, about 30 staff when all positions are filled.

The Nome Highway team of six personnel has the normal responsibility of maintaining Nome area state roads and highways. This small but mighty team is also tasked with maintaining 300 miles of gravel roads during the summer months.

Even before the storm was over, Calvin's crew took action. M&O airport staff helped the local fire department respond to the Bering Sea Bar and Grill fire that was stoked by the storm's unrelenting winds. While the restaurant was lost to the blaze, the crews managed to protect the Nugget Inn next door. M&O staff also assisted with cleaning up the debris from the fire and storm damages, working side-by-side with the City of Nome and other local entities. Outside of Nome, the Western District Crew is responsible for a total of 42 airports stretching along the Western Alaska coast from Point Hope to the Saint Mary's Yukon River area. This includes 4 hub airports with about 10 outlying communities around each. A collaborative response effort was also established between DOT&PF and other entities for several coastal communities that sustained damages.

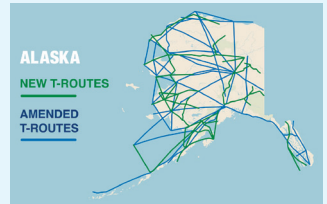
In the months since, a high-level of collaboration between various DOT&PF departments and the City of Nome has



FAA NEWS & UPDATES

FAA Activates New GPS-Guided Routes in Alaska to Fly Below Hazardous Weather

The FAA is publishing 54 Global Positioning System (GPS)-guided routes in Alaska, allowing pilots to navigate direct flight paths at lower altitudes to



avoid icing conditions. The 30 new and 24 amended Terminal Transition Routes, known as T-routes, are part of the FAA's [Alaska Aviation Safety Initiative](#).

Pilots use T-routes to navigate along specific points while flying under instrument flight rules (IFR) using approved GPS/Global Navigation Satellite System (GNSS) equipment. With the activation of six new GPS-guided routes in Alaska this month, the FAA is on schedule to have over 50 of these T-Routes in place by August for Alaska. The FAA is developing additional T-routes to replace Low Frequency/Medium Frequency (LF/MF) airways between now and 2025.

It's all about Safety: GPS Backup Resiliency

Another effort currently underway is not new technology, but rather a realization that redundancy is critical. The FAA is working with military and civil users to develop and refine a GPS resiliency plan for Alaska navigation that accounts for potential losses or interference in GPS and WAAS signals. The plan includes identifying critical conventional navigation aids (NAVAIDs) to be included in the appropriate programs for funding, implementation, and long-term support. The FAA Alaska Aviation Safety Initiative (FAASI) roadmap and additional information are available on FAA website at [FAASI Roadmap | Federal Aviation Administration](#).



Point of view of a DOT&PF equipment operator on the day of the storm.

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AASP Spotlight continued

sustained efforts to rebuild. Calvin's crew and DOT&PF construction engineers worked together to help survey and document the damage in their district, contributing to the [Alaska DOT&PF West Coast Storm Response GIS Dashboard](#). The Department is using the public dashboard to document damage locations and match eligible projects with available FEMA funds. Calvin's team led the immediate effort to remove debris and make roads in the Nome area passable again. For example, the Nome-Council Highway sustained significant damages from town to 34 miles out. His crew was instrumental in filling in washed out sections, regrading, and repairing the first 5 miles of the highway leading out from town before a contractor was brought on to tackle the remainder of the road. After about a month of collaborative efforts this reopened the road for travel to Council and other camps,

allowing Nome-area residents to recover their property and for those stuck past the breach to return with their vehicles and belongings back to the City.

According to Calvin, the best part of his job is the people he gets to work with. He is always amazed by his crew's commitment to Alaska's transportation needs and their ability to overcome challenges, improvise, and get the job done for the remote communities they serve. Despite the difficulties of short staffing and recruitment, the Nome-based M&O crew has continued to go above and beyond in their dedication to keep Alaska moving through service, infrastructure, and most recently, emergency storm response.



Calvin Schaeffer, DOT&PF



Calvin Schaeffer, DOT&PF

Just south of the breach at mile 25 of Nome-Council Highway.



Calvin Schaeffer, DOT&PF

Mile 1.8 of Nome-Council Highway one week after Typhoon Merbok. Emergency road repairs were made by the DOT&PF Nome Highways crew.



Calvin Schaeffer, DOT&PF

Front Street clean-up the day following the storm.

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While the excitement around these new technologies is real, so are the engineering challenges. All-electric models seek to reduce weight and maximize their power-to-weight ratios. With the weight penalty of batteries and the energy requirements of vertical lift and for de-icing, the initial markets for pure electric AAM vehicles may be limited to warmer climates. On the other hand, due to the importance of air cargo in Alaska, there likely be many applications for fully electric AAM vehicles in Alaska as the technology progresses.

Additional information about UAS safety and operations in Alaska is available on the Department website <https://dot.alaska.gov/uas/>. One early result from this project involves finding the service gaps in certified weather reporting. Alaska has 44 Automated Surface Observing System (ASOS) weather stations and 109 Automated Weather Observing System (AWOS) weather stations (see page 1 map). To date, the project team has facilitated several conversations with the FAA about reducing down time for these systems to provide dependable weather service to

our aviators. An initial review of existing outages, conducted in February 2023, found a total of 70 outage reports at 47 locations (some facilities had multiple issues). Now, that total has been reduced from 47 sites with issues to 31. The FAA has put forth a strong effort to remedy what is under their control and coordinate with sub-contractors (such as telecommunications providers) where necessary. An example of the status tracking is included on the [AASP website \(Alaska AWOS Status Dashboard\)](#).



AirTime

Q What is T-100?

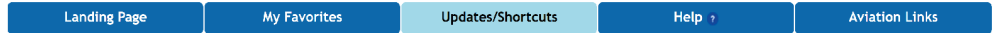
A T-100 is data shared by the Bureau of Transportation Statistics (BTS). It is monthly data reported by certificated U.S. and foreign air carriers on passengers, freight and mail transported. The AASP utilizes the [T-100 Domestic Market \(All Carriers\)](#) table, which contains domestic market data reported by both U.S. and foreign air carriers. Data points include carrier, origin, destination, and service class for enplaned passengers, freight and mail, when both origin and destination airports are located within the United States and its territories. While not yet reported in the AASP, the dataset also includes additional variables of aircraft type, service class, available capacity and seats, and aircraft hours (ramp-to-ramp and airborne). DOT&PF planners and engineers use T-100 data to understand airport usage and plan appropriately for capital improvements over time. Learn more about T-100 data at: <https://www.transtats.bts.gov/>.



Coach Class

New Shortcuts to Reports and Graphs

By Annette Lapkowski, PE, Panther International Project Manager



Action Items: To view Updates/Shortcuts for specific airports, navigate to My Account and select facilities. [Export to Excel](#)

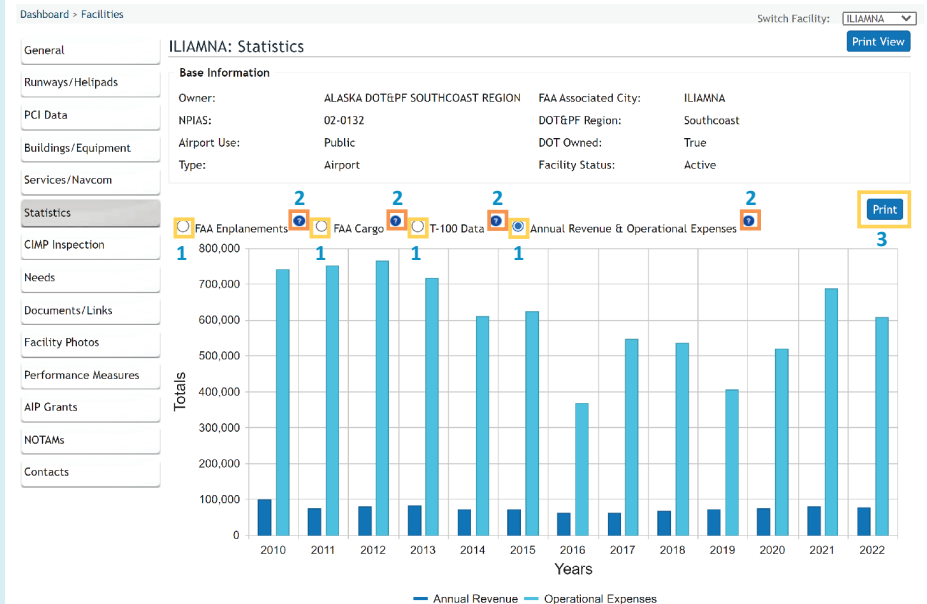
Airport	Activity	Alert Date
Multiple	APEB Meeting Upcoming on 2/23/2023	2/10/2023
BETHEL	APEB Project: APEB Summary - Scorecard Complete (APEB Final Score: 149.80)	10/25/2022
BETHEL	APEB Project: Chief Review - Submit Scorecard/Pending APEB Meeting	10/11/2022
Multiple	APEB Meeting Upcoming on 10/13/2022	10/3/2022
BETHEL	APEB Project: Chief Review - Submit Scorecard/Pending APEB Meeting	10/3/2022



Choose Region and select button

Depending on your browser, report will be located in the top or bottom banner where downloads appear

On the internal AASP website, the Dashboard now provides a direct link to additional reports on the Updates/Shortcuts tab. When selected, they automatically generate the Annual Revenue & Operational Expenses data for the selected region. In one click, you have the Excel report that draws data from the Facilities tab.



Source: Alaska Department of Transportation and Public Facilities 4

You can view a chart of this same data by visiting Statistics where you can view data for FAA Enplanements and Cargo, T-100 data, and Annual Revenue & Operational Expenses. Select the radio button in front of each data element to see that information on the chart.

If you scroll further down, all statistics are available in a table including historical years, which might not appear on the chart, but can be download into Excel (Facilities > Statistics).

1. Select Radio Button to see data on the chart
2. The Question Hover provides more information about the data
3. Select Print to take the charts on the go or to share with others
4. The Source is provided at the bottom of each chart

WAAS to Water LPV Approach

Adapted from article by Amy Trevisan, FAA AJM-32/ NAVTACII from the FAA SATNAVNEWS with contributions from Alec Seybold, Flight Tech Engineering

There is an old saying that necessity is the mother of invention. In Alaska, necessity breeds innovation, such as with the first Wide Area Augmentation System (WAAS) Localizer Performance with Vertical Guidance (LPV) to water. While an expansive WAAS route network exists for aircraft landing on traditional paved runways in Alaska, seaplane operations still require operating in Visual Flight Rules (VFR) due to the lack of instrument procedures for water landings. Instrument Procedures to seaplane bases



do exist and the FAA even maintains working examples; however, they are not based on WAAS technology and therefore have high

weather minimums (or a requirement to visually obtain the runway environment).

In Alaska the persistent low clouds prevent the development of an effective traditional procedure.

The first WAAS to Water approach in Alaska was initiated in June 2021 for Island Air Express at El Capitan Lodge Seaplane Base (5C5) in Southeast Alaska.

In addition to the 5C5 approach, FAA-authorized Navigation Service Provider Flight Tech Engineering developed new WAAS LPV procedures at Donlin Gold Mine and a WAAS LPV 200 procedure for the Red Dog Mine. Flight Tech is also continuing to expand its [Southeast Alaska NavShare](#) project. Since March 2020, the Southeast Alaska NavShare project has included the development, validation, and implementation of 20+ new instrument flight rule (IFR) procedures, providing enhanced all-weather airport access to the region. The goal is to bring WAAS procedure advancements with



A pilot completes an instrument flight rule (IFR) landing at El Capitan Lodge Seaplane Base (5C5) in Southeast Alaska.

Alec Seybold, Flight Tech

localizer performance (LP) or localizer performance with vertical guidance (LPV) lines of minima to all locations in Southeast Alaska. Airports with new procedure offerings include Juneau, Haines, Hoonah, Sitka, Petersburg, Wrangell, Kake, Klawock, and Ketchikan. Procedures are available for any operator to subscribe to by contacting Flight Tech at IFP@flight-tech.aero.

Read the full article at faa.gov or view the video [WAAS is Working: Episode 6 – Floatplanes in Alaska](#) on FAA's YouTube channel.

AASP PROJECT UPDATE

By Becky Cronkhite, RESPEC Project Manager

The AASP team continues to upgrade and improve the AASP website, adding new functionality and reports for internal DOT&PF users as they strive to take advantage of federal infrastructure funding opportunities. Tracking airport projects and needs and

integrating all available information into the AASP website remains a key task for the project team.

The AASP website will soon host an interactive public comment map that will allow airport users to post comments and ideas for specific airports. This resource will provide valuable information and feedback to the AASP team and the general public about things that are working well across the airport system and areas that can be improved.

The team is moving forward on the airport

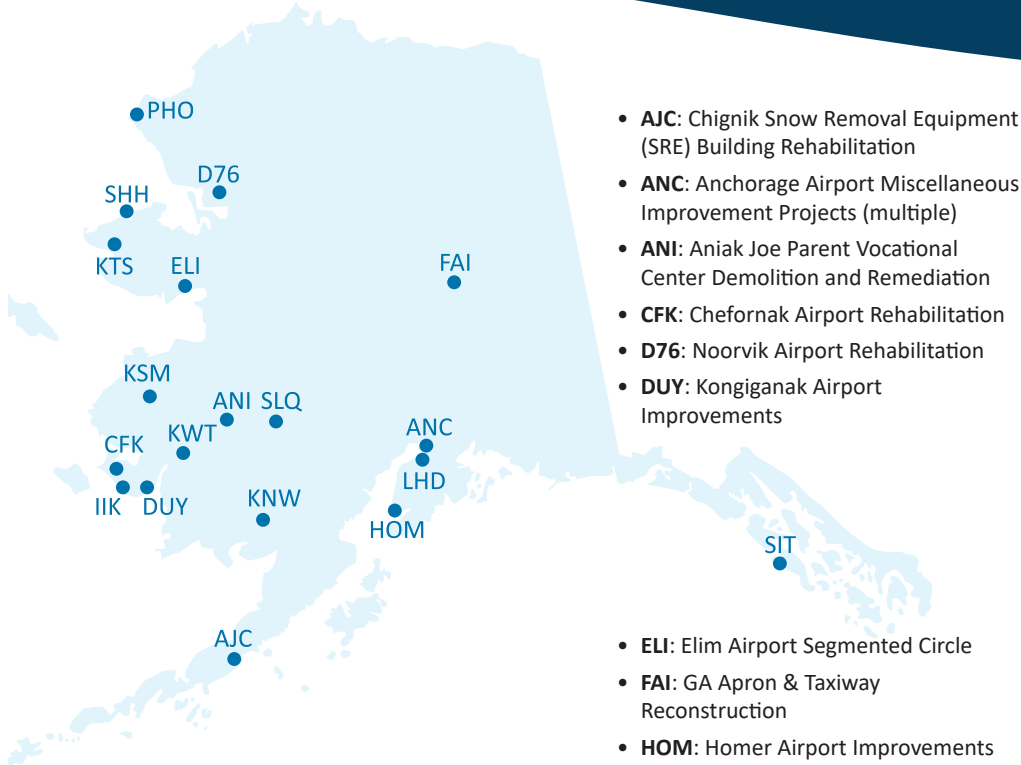
resiliency study. This study focuses on airport construction materials and design elements to identify ways to increase the resilience of our infrastructure projects against severe weather and a changing climate. Additionally, the team is continuing to develop a new and improved Capital Improvement and Maintenance Program (CIMP) inspection application. The new application will move to beta testing in the summer of 2023.

As the spring and summer seasons approach, the team will be manning booths and interacting with the aviation community at several local aviation events. Look for us at the Great Alaska Aviation Gathering in Palmer May 6th-7th, the Valdez Fly-In and Air Show May 12th-14th, Fairbanks Aviation Day May 20th, and Kenai Peninsula Air Fair June 10th!



Natalie Lynn, RESPEC

Aircraft on display at the 2022 Great Alaska Aviation Gathering in Palmer, AK.



2023 Construction Update

Construction season—er, I mean summer—is coming! This applies not only to highways but to our airports as well. While runway closures will occur on some projects, construction safety and phasing plans (CSPPs) work to minimize impacts as much as possible. 2023 DOT&PF airport construction projects range from runway resurfacing and realignments to building rehabilitations and airport lighting upgrades. Some highlights include resurfacing plus airport lighting replacement at Saint Mary's (KSM), realignment of the runway at Point Hope (PHO), and a new Snow Removal Equipment Building (SREB) at Kongiganak (DUY). About 48 projects will occur this season to keep Alaskans moving year-round across the aviation system.

- **AJC:** Chignik Snow Removal Equipment (SRE) Building Rehabilitation
- **ANC:** Anchorage Airport Miscellaneous Improvement Projects (multiple)
- **ANI:** Aniak Joe Parent Vocational Center Demolition and Remediation
- **CFK:** Cheforak Airport Rehabilitation
- **D76:** Noorvik Airport Rehabilitation
- **DUY:** Kongiganak Airport Improvements

- **ELI:** Elim Airport Segmented Circle
- **FAI:** GA Apron & Taxiway Reconstruction
- **HOM:** Homer Airport Improvements
- **IIK:** Kipnuk Airport Rehabilitation
- **KNW:** New Stuyahok Airport Resurfacing
- **KSM:** Saint Mary's Airport Improvements
- **KTS:** Brevig Mission Lighting and Resurfacing
- **KWT:** Kwethluk Airport Rehabilitation
- **LHD:** Aircraft and Lakeshore Drive Rehabilitation
- **PHO:** Point Hope Airport Realignment
- **SHH:** Shishmaref Airport Erosion Control
- **SIT:** Sitka SRE Building Rehabilitation and Sitka Terminal Phase I
- **SLQ:** Sleetmute Airport Runway Resurfacing and Lighting Replacement

ANC Third Busiest in the World for Cargo in 2022

April 5, 2023 (ANCHORAGE, AK) – The Ted Stevens Anchorage International Airport (ANC) surpassed Shanghai Pudong Airport (PVG) to claim the slot for third busiest airport in the world for cargo. In 2022, 3,461,603 metric tons of cargo transited ANC's runways. The rankings of airports are conducted by the Airport Council International World. See press release [here](#).



Cargo planes are a common sight at Anchorage International.



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In The Works ...

The AASP team is currently designing publicly available reports so that members of the public (residents, businesses, aviation professionals, and visitors) can extract key information from the Alaska Aviation System Plan independently. The team is considering variations of existing reports as well as some new reports that include planned project timelines. Soon to follow will be the development, testing and implementation of these new public reports.

www.AlaskaASP.com



The AASP project is managed by the State of Alaska Department of Transportation and Public Facilities (DOT&PF), Division of Statewide Aviation. Additional assistance is provided by the Aviation Advisory Board, private aviation organizations, local airport sponsors, air carriers, aviation-related businesses, and pilots.

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