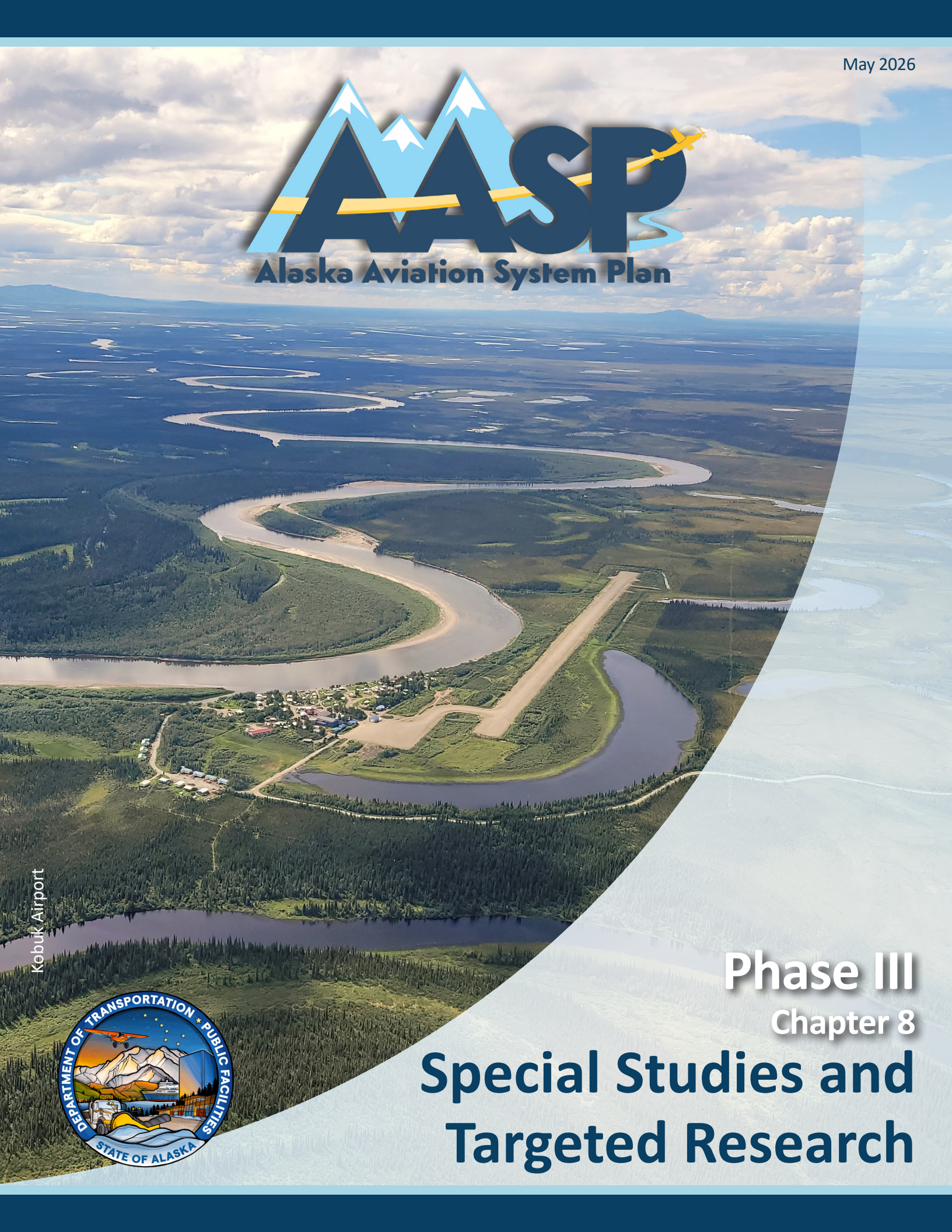




# AASP

Alaska Aviation System Plan



Kobuk Airport



## Phase III

### Chapter 8

# Special Studies and Targeted Research



Project No. CFAPT00484 | AIP 3-02-0000-033-2024

## Commonly Used Acronyms

<b>AAC</b>	<b>Aircraft Approach Category</b>
<b>AASP</b>	<b>Alaska Aviation System Plan</b>
<b>ACIP</b>	<b>Airport Capital Improvement Program</b>
<b>ADG</b>	<b>Airport Design Group</b>
<b>AIP</b>	<b>Airport Improvement Program</b>
<b>ALP</b>	<b>Airport Layout Plan</b>
<b>ASOS</b>	<b>Automated Surface Observing System</b>
<b>AWOS</b>	<b>Automated Weather Observing System</b>
<b>CATEX</b>	<b>Categorical Exclusion</b>
<b>DOT&amp;PF</b>	<b>Department of Transportation and Public Facilities</b>
<b>EA</b>	<b>Environmental Assessment</b>
<b>EIS</b>	<b>Environmental Impact Statement</b>
<b>FAA</b>	<b>Federal Aviation Administration</b>
<b>IAP</b>	<b>Instrument Approach Procedures</b>
<b>LARC</b>	<b>Lease Application Review Committee</b>
<b>NEPA</b>	<b>National Environmental Policy Act</b>
<b>NPIAS</b>	<b>National Plan of Integrated Airport Systems</b>
<b>PIREP</b>	<b>Pilot Weather Reports</b>
<b>TDG</b>	<b>Taxiway Design Group</b>
<b>USPS</b>	<b>United States Postal Service</b>

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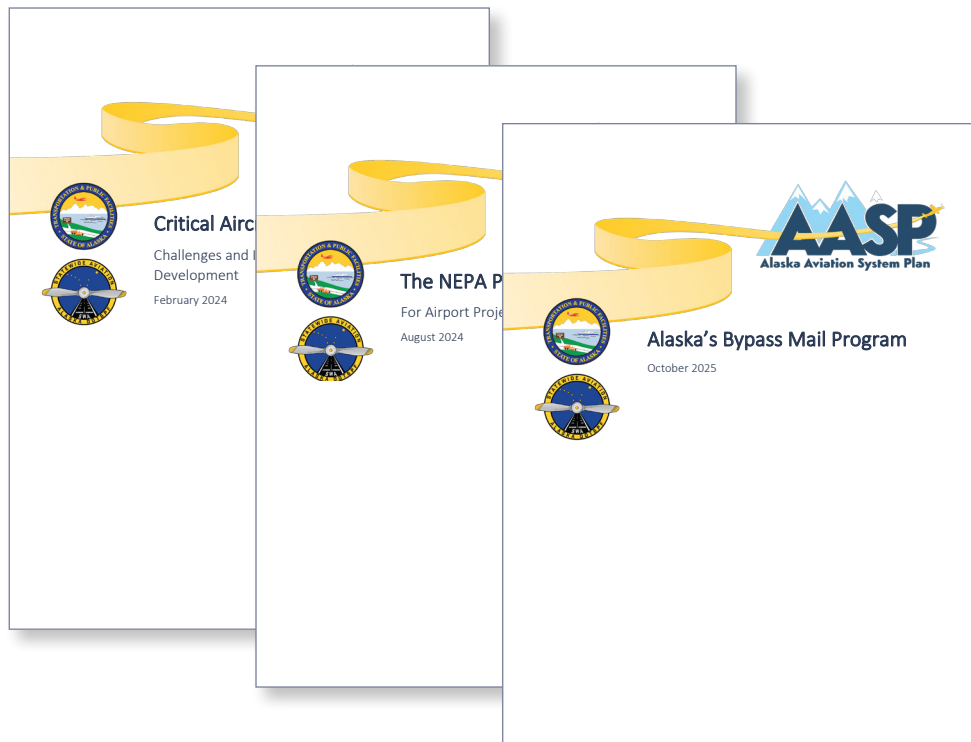


# I. Special Studies and Targeted Research Methodology

Special studies and targeted research are a foundational component of the Alaska Aviation System Plan (AASP) throughout each phase of the plan. These efforts provide user-friendly information to support understanding of Alaska’s aviation system and the frameworks that guide aviation planning and investment. The resulting white papers translate complex regulatory, technical, and operational considerations into practical guidance for planners, airport sponsors, and the public, helping to explain how Alaska’s airports are planned, designed, and managed.

AASP white papers address a broad range of aviation topics, including planning, design, and operations. Topics range from critical aircraft determination and weather reporting to rural airport needs and emerging technologies; these topics were selected based on public interest, system needs, and input from Alaska Department of Transportation and Public Facility (DOT&PF) planners to provide detailed content that better informs everyone on different processes and requirements.

Collectively, the white papers provide a broad understanding of Alaska’s aviation system and are useful primers for DOT&PF staff, consultants, and local airport sponsors who may be new to aviation planning, Alaska, or both. These studies also improve transparency and public understanding by making technical processes and regulatory requirements more approachable and by providing reference materials that explain how the aviation system functions. Public engagement is central to safe, efficient, and sustainable airport development across the state, and the AASP white papers are intended to serve as educational resources that clarify processes, roles, and requirements for a diverse range of users. Appendix A indicates which Airport Improvement Program grant funded each white paper.



## II. Study and Research Topics

### Critical Aircraft Determination

*Why this study matters:*

- ▶ Describes the aircraft-based design standards for runways, taxiways, and safety areas, using the critical aircraft to determine design criteria so that airfield dimensions, safety surfaces, and separation standards are appropriately sized.
- ▶ Explains how AIP funding eligibility is influenced by documented regular aircraft use.
- ▶ Provides consistent data methods for rural airports using T-100 and local interviews.

The Critical Aircraft Determination white paper explains the Federal Aviation Administration (FAA) driven process for identifying the critical aircraft, or the aircraft with the most demanding operational characteristics, that regularly use a given airport, and how this determination directly informs airport planning, design standards, and eligibility for FAA Airport Improvement Program (AIP) funding. It outlines how the critical aircraft's performance and dimensional requirements establish key design parameters such as runway length and width, taxiway and safety area criteria, and other airfield infrastructure specifications. Additionally, it emphasizes that accurate and current determinations are essential for safe, efficient airport development and realistic project cost estimating across Alaska's rural airport network. Rural airports in Alaska often lack comprehensive operational counts, but all sponsors are required to do critical aircraft determinations. The report details DOT&PF's methodology for documenting regular use. This includes reliance on U.S. Department of Transportation Bureau of Transportation Statistics T-100 data supplemented by local airport manager interviews and explains how aircraft are grouped by FAA design categories like Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG) to support consistent, standards-based planning. It also discusses the necessity of periodic revalidation of critical aircraft as fleet mixes and operations evolve to ensure ongoing compliance with FAA regulations and to maintain project eligibility for federal grants.

Read the Full Study: [https://www.alaskaasp.com/media/4587/2024\\_02\\_29\\_final\\_critical\\_aircraft\\_final.pdf](https://www.alaskaasp.com/media/4587/2024_02_29_final_critical_aircraft_final.pdf)



# The National Environmental Policy Act Process

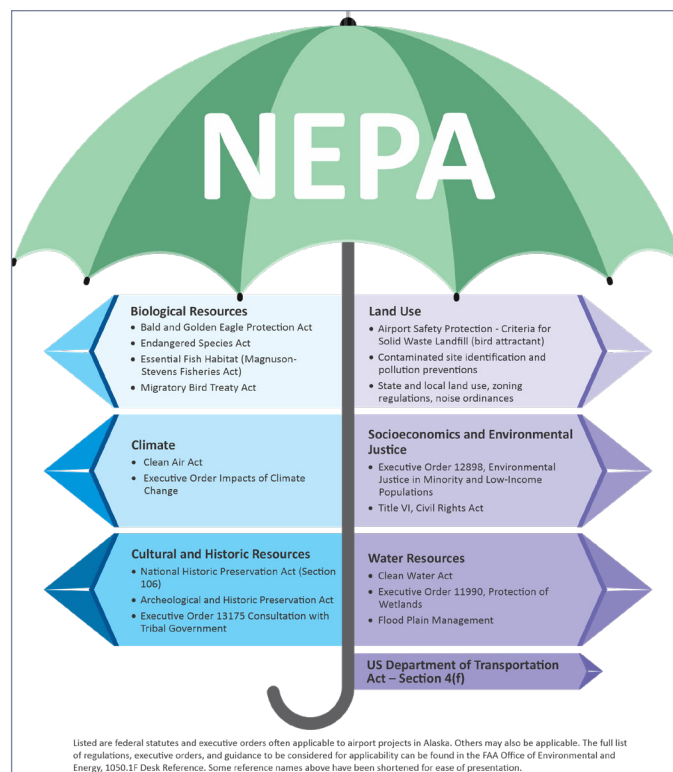
## Why this study matters:

- ▶ Explains the differences between CATEX, EA, and EIS review.
- ▶ Identifies environmental constraints that influence project design and timelines.
- ▶ Discusses the importance of integrating federal resource considerations early in planning.

The National Environmental Policy Act (NEPA) white paper describes how the NEPA framework is integrated into airport project development in Alaska, particularly for projects requiring FAA approval or federal funding. It outlines NEPA's purpose as a procedural law that mandates evaluation of environmental impacts, consideration of alternatives, mitigation planning, agency coordination, and public participation before federal decisions on airport projects. The document explains the three primary NEPA environmental classes of action: Categorical Exclusion (CATEX), Environmental Assessment (EA), and Environmental Impact Statement (EIS), and details how each one may be triggered based on project scope and potential environmental effects, along with associated documentation and approval requirements.

In addition to procedural requirements, it discusses how NEPA interacts with other regulatory processes and environmental considerations relevant to Alaska's airport projects, such as wetlands, water quality, biological and cultural resources, land acquisition, and floodplain issues. It emphasizes the importance of integrating NEPA early into project planning and design, developing clear purpose and need statements, and accounting for timelines that can extend from months to several years, depending on complexity. The report also highlights how NEPA outcomes can influence design decisions and project feasibility, ensuring environmental constraints and stakeholder input are formally incorporated into Alaska airport development.

Read the Full Study: [https://www.alaskaasp.com/media/4841/2024-08-12\\_aasp\\_nepa\\_whitepaper\\_final.pdf](https://www.alaskaasp.com/media/4841/2024-08-12_aasp_nepa_whitepaper_final.pdf)



# National Plan of Integrated Airport Systems

*Why this study matters:*

- ▶ Describes the history and purpose of the NPIAS.
- ▶ Explains how airports become eligible or ineligible for AIP grant funding.
- ▶ Explains the relationship between FAA and Alaska airport classifications.

The National Plan of Integrated Airport Systems (NPIAS) white paper provides a comprehensive overview of the NPIAS, detailing its history, purpose, and critical role in determining federal funding eligibility for airport development projects. It explains how the NPIAS is mandated by federal statute to identify public-use airports that are essential to the national aviation system and to catalog near-term, unfunded capital needs for these airports. The document outlines key components, including airport inclusion criteria, the process for adding or withdrawing airports, the relationship between the NPIAS and the Airport Capital Improvement Program (ACIP), and how NPIAS classifications influence AIP entitlements and discretionary funding.

The paper also describes how the AASP integrates with the NPIAS, emphasizing the ongoing collaboration between the DOT&PF and the FAA to ensure Alaska’s airports are accurately categorized and eligible for federal grants. It highlights differences between the broader national classification system used by the NPIAS and the more detailed, Alaska-specific classifications in the AASP, which consider factors like road connectivity and mail hubs. Additionally, the report discusses the implications of congressional reauthorization on funding priorities, emerging aviation technologies, and targeted safety initiatives, underscoring the importance of maintaining current system data to support effective planning and maximize funding opportunities for Alaska’s aviation infrastructure.

Read the Full Study: [https://www.alaskaasp.com/media/4917/npias\\_white\\_paper\\_nov\\_2024\\_final.pdf](https://www.alaskaasp.com/media/4917/npias_white_paper_nov_2024_final.pdf)

Public-Use Airports				
Public Airports			Privately Owned Airports	
Commercial Service	Reliever	General Aviation	Reliever	General Aviation
Large Hub	National	National	National	National
Medium Hub	Regional	Regional	Regional	Regional
Small Hub	Local	Local	Local	Local
Nonhub	Basic	Basic	Basic	Basic
Nonprimary Commercial Service	Unclassified	Unclassified	Unclassified	Unclassified

■ Primary  
■ Nonprimary

## Aviation Weather Reporting in Alaska

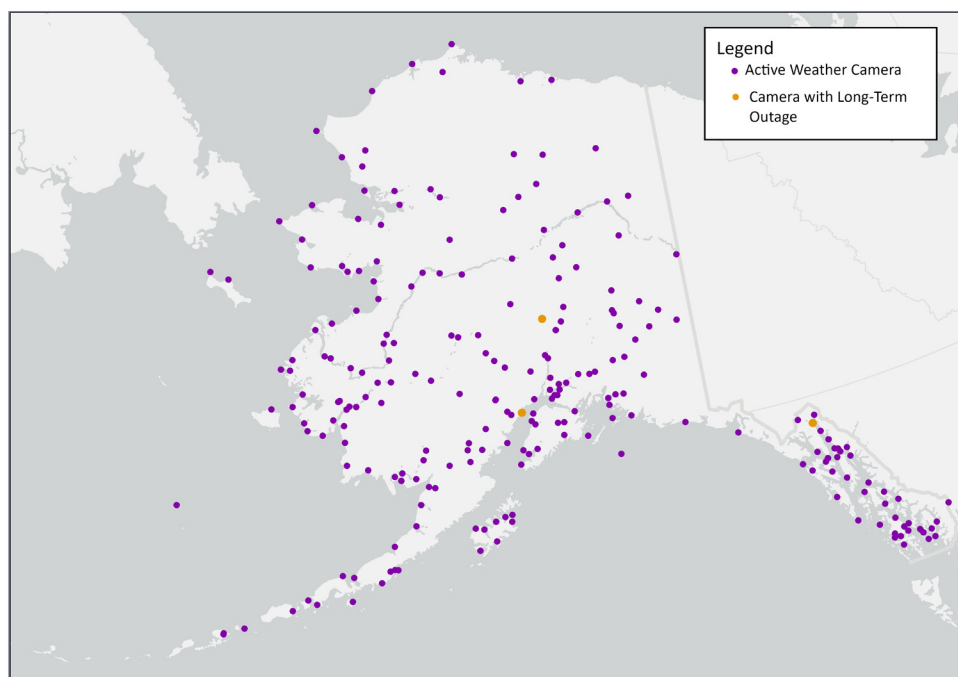
### *Why this study matters:*

- ▶ Discusses the importance of weather observation systems for flight operations.
- ▶ Supports planning for AWOS/ASOS expansion and reliability improvements.
- ▶ Reflects policy and technology changes shaping Alaska’s weather system.

Weather reporting was addressed in a prior phase of the AASP (Phase II: 2012-2017). The updated Aviation Weather Reporting white paper reviews the current state of aviation weather observation and reporting systems in Alaska, highlighting the unique challenges posed by the state’s vast, remote geography and sparse weather data network and how these limitations affect flight planning, safety, and access to instrument flight procedures. It reviews the range of weather observation sources, including FAA-certified automated sensors like the Automated Weather Observing System (AWOS) and Automated Surface Observing System (ASOS), human observers, pilot weather reports (PIREPs), and supplementary data, including weather cameras. It also discusses how weather reporting is critical for air carriers and pilots during flight planning, route selection, and takeoff and landing decisions. The report summarizes progress made in addressing previously identified gaps, including recent installations of new AWOS stations through supplemental federal funding, while pointing out ongoing issues such as connectivity reliability and the remaining observational gaps across rural airports.

Additionally, the white paper assesses the integration of new technologies and policy changes aimed at improving weather data coverage and utility in Alaska’s aviation system. It documents efforts to expand certified reporting infrastructure, such as human and non-federal observation programs and the utilization of advanced camera and sensor technologies, and underscores how federal legislative updates (including requirements from the 2024 FAA Reauthorization Act) are shaping strategies to address current gaps in weather reporting capabilities in Alaska. The report frames these developments in the context of Alaska’s operational needs, showing how enhanced weather information and reporting systems support safer flight operations and better access to instrument flight procedures statewide.

Read the Full Study: [https://www.alaskaasp.com/media/4935/2024-12-10\\_weather\\_white\\_paper\\_final.pdf](https://www.alaskaasp.com/media/4935/2024-12-10_weather_white_paper_final.pdf)



# Alaska's Bypass Mail Program

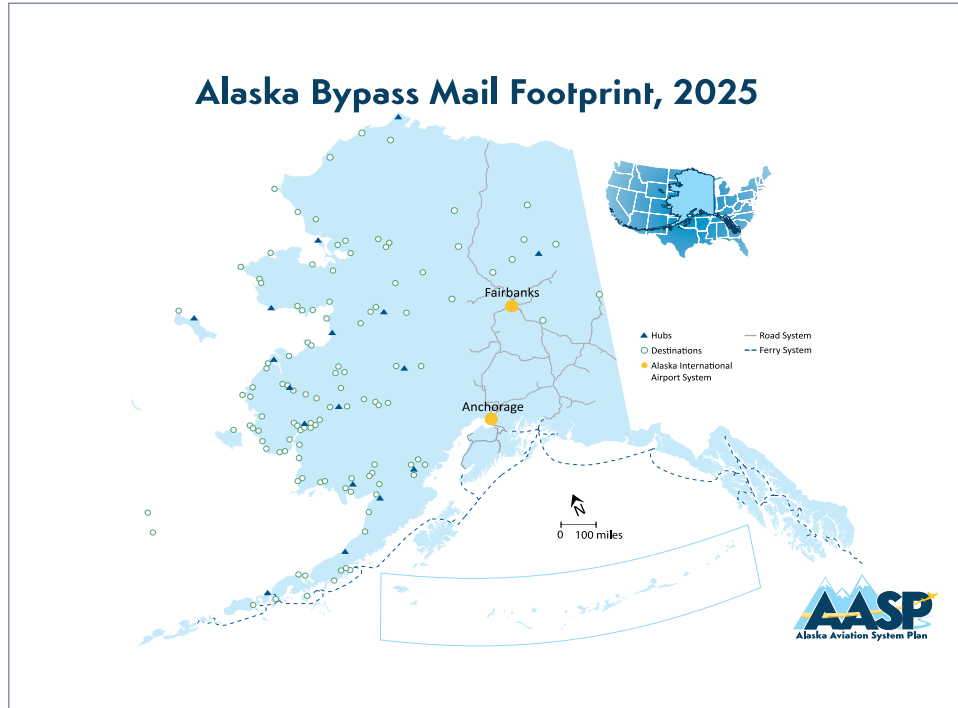
## Why this study matters:

- ▶ Explains the need for subsidized mail service to remote communities.
- ▶ Describes the reliance on DOT&PF-maintained airport infrastructure.
- ▶ Explains the roles of the USPS, air carriers, and shippers in the program.

The Alaska Bypass Mail Program white paper explains the Bypass Mail program, a long-standing United States Postal Service (USPS) mechanism that was created to ensure delivery of bulk mail directly to rural Alaska communities by bypassing traditional postal facilities and leveraging air carriers for last-mile delivery. Because of Alaska's vast geography and limited road infrastructure, the program enables shippers meeting specific criteria to send non-priority mail at ground-based rates despite predominant use of air transportation, helping the USPS fulfill its universal service obligation to isolated communities without maintaining processing facilities in every village. It outlines operational logistics, including mainline acceptance at Anchorage and Fairbanks hubs and subsequent transfers to bush carriers for distribution to 120 to 130 remote destinations, and describes how the program has evolved since its creation in the 1970s.

The paper also discusses DOT&PF's role in supporting Bypass Mail by prioritizing airport infrastructure maintenance and performing upgrades that facilitate reliable delivery. It reviews historical and ongoing policy discussions about the program's cost structure and potential changes.

Read the Full Study: [https://www.alaskaasp.com/media/5517/2025-10-21\\_aasp-11f\\_bypassmail\\_whitepaper\\_final.pdf](https://www.alaskaasp.com/media/5517/2025-10-21_aasp-11f_bypassmail_whitepaper_final.pdf)



# Instrument Approach Procedures


## Why this study matters:

- ▶ Explains the purpose and importance of IAPs.
- ▶ Describes the difference between precision and non-precision approaches.
- ▶ Explains how to read an Instrument Approach Plate.

The Instrument Approach Procedures (IAPs) white paper provides a comprehensive overview of IAPs and their critical role in supporting safe and reliable flight operations across Alaska's aviation system, particularly in challenging weather and terrain conditions. It explains that IAPs are predetermined, standardized flight paths that guide aircraft from en route airspace to a runway and distinguishes between precision approaches (which provide both lateral and vertical guidance) and non-precision approaches (which provide lateral guidance only). The document also details how IAPs enhance safety by ensuring obstacle clearance and improved reliability in low visibility, and it serves as a planning tool by identifying existing approach capabilities and gaps at public airports throughout the state, supporting infrastructure investment decisions such as navigational aids, lighting, and funding prioritization.

In addition to the technical description of IAP types and approach plate interpretation, the paper includes an extensive inventory of instrument approach procedures at Alaska's public airports and guidance on understanding FAA publications and approach plate information. By documenting which airports have existing IAPs and the nature of those procedures, the report supports aviation system planning efforts that aim to improve access, optimize airport development, and enhance operational safety and consistency across Alaska's unique airspace environment.

Read the Full Study: [https://www.alaskaasp.com/media/5950/2025-12-09\\_white\\_paper\\_iap\\_final.pdf](https://www.alaskaasp.com/media/5950/2025-12-09_white_paper_iap_final.pdf)



**Instrument Approach Plate**

24361

**ILS Y or LOC Y RWY 23**

ADAK (ADK) (P/ADK)

This document outlines the major components of instrument approach plates and how to interpret approach restrictions or minimums.

An Instrument Approach Procedure (IAP) is a predetermined flight path that aircraft must follow when landing at an airport under Instrument Flight Rules (IFR).

An IAP provides a structured method for descending from the enroute airspace to a point where a safe landing can be executed and guide pilots in performing proper landings by providing necessary restrictions, instructions, and frequencies.

Pilots and aviation personnel must ensure they are using the most current versions to maintain compliance and ensure flight safety.

**Margin Identification**

- Airport location
- Airport identifier and responsible organization
- Type of approach
- Date last updated: Upper right 24361 (361st day in 2024)
- Effective date along sides

**Briefing Strip**

- Airport frequency and information
- Warnings and/or instructions
- Approach lighting representation
- Missed approach instructions
- Comm frequencies for approach and tower

**Plan View**

- Solid line represents the flight path
- Dashed line represents the missed approach path
- Minimum safe altitude on upper left

**Profile**

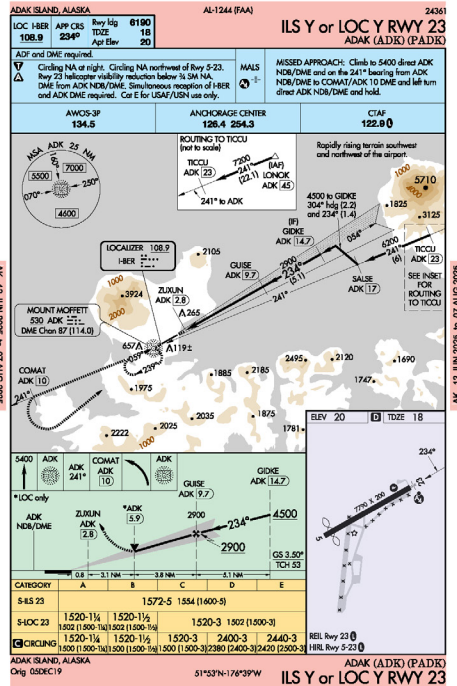
- Solid line represents the flight path
- Dashed line represents the missed approach path
- Guidance on upper left for missed approach

**Landing Minimums**

- Landing minimums depending on category, elevation needed per category and sight distance in nautical miles

**Airport Sketch**

- Taxiway diagram, Touchdown Zone Elevation (TDZE), airport elevation, runway identifier



Category	A	B	C	D	E
54523	1520-1½	1520-1½	1572-5	1534 (1400-5)	
5400	1520-1½	1520-1½	1520-3	1502 (1400-3)	
5400	1520-1½	1520-1½	1520-3	2400-3	2440-3
5400	1520-1½	1520-1½	1500 (1500-3)	2420 (2300-3)	

Information on where to locate IAPs can be found on official FAA websites:  
<https://adip.faa.gov/agis/public/#/public>  
[https://www.faa.gov/air\\_traffic/flight\\_info/aeronav/procedures/application/](https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/application/)

# Rural Airport Leasing Program

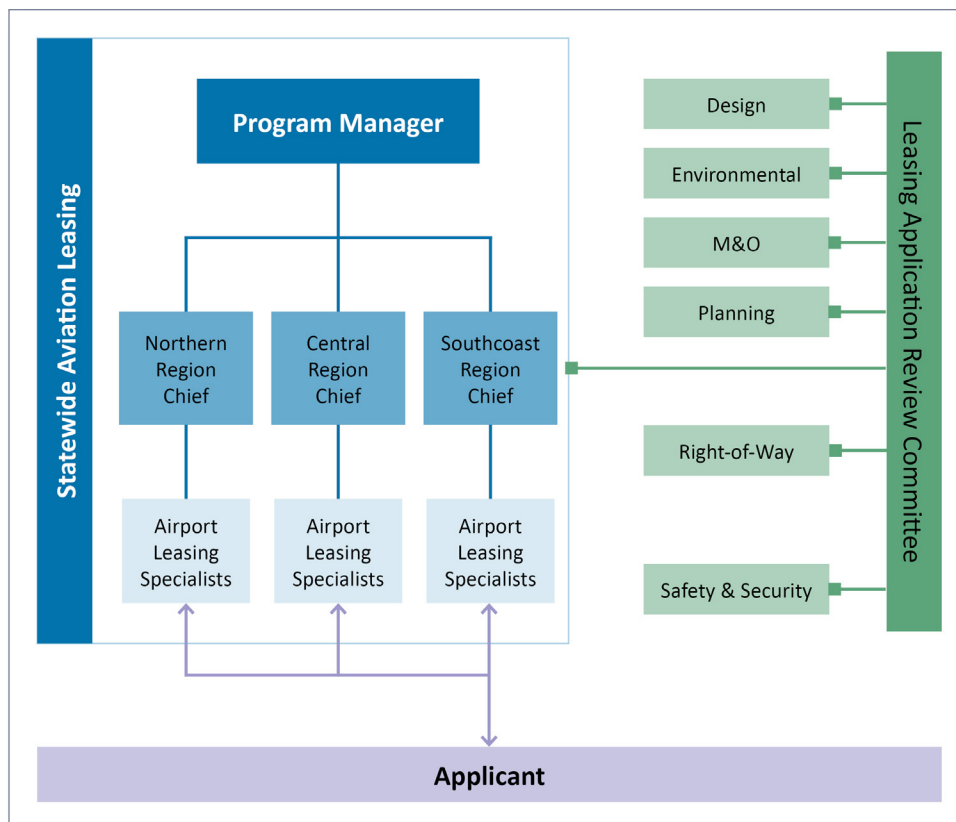
## Why this study matters:

- ▶ Describes the purpose, benefits, and constraints of the airport leasing program.
- ▶ Explains the difference between airport leases and airport land use permits.
- ▶ Clarifies the DOT&PF lease review and approval process.

The Rural Airport Leasing Program white paper outlines the framework for managing airport land in Alaska to support aeronautical operations, community needs, and long-term financial sustainability, and highlights the role of leasing in future airport planning, design, and construction. It describes the different types of land use agreements, including long-term leases, short-term permits, and assigned-space aircraft parking (tiedown) permits, and explains how these authorizations are structured under state law and FAA grant assurances. The document emphasizes the distinction between aeronautical and non-aeronautical uses, ensuring that airport land primarily supports aircraft operations while allowing revenue-generating non-aeronautical uses under strict FAA oversight. Environmental compliance, including NEPA and contamination considerations, is highlighted as a critical component of the leasing process, along with alignment with Airport Layout Plans (ALPs) and other federal and state regulations.

The paper also details the leasing application and review process, which involves consultation with Airport Leasing Specialists, submission of applications, technical and multidisciplinary evaluation by the Lease Application Review Committee (LARC), public notice, and eventual contract execution. It highlights the DOT&PF's role as a landlord, technical advisor, and regulatory partner, ensuring agreements meet safety, operational, and financial requirements while supporting rural airport development. By providing clear processes, guidance, and regional support, the leasing program promotes investment in airport infrastructure, enables essential services in remote communities, and generates revenue that is reinvested in airport operations and improvements, thereby sustaining Alaska's rural airport system.

Read the Full Study: [https://www.alaskaasp.com/media/6194/rural\\_airport\\_leasing\\_program\\_final.pdf](https://www.alaskaasp.com/media/6194/rural_airport_leasing_program_final.pdf)



# The Airport Master Planning Process

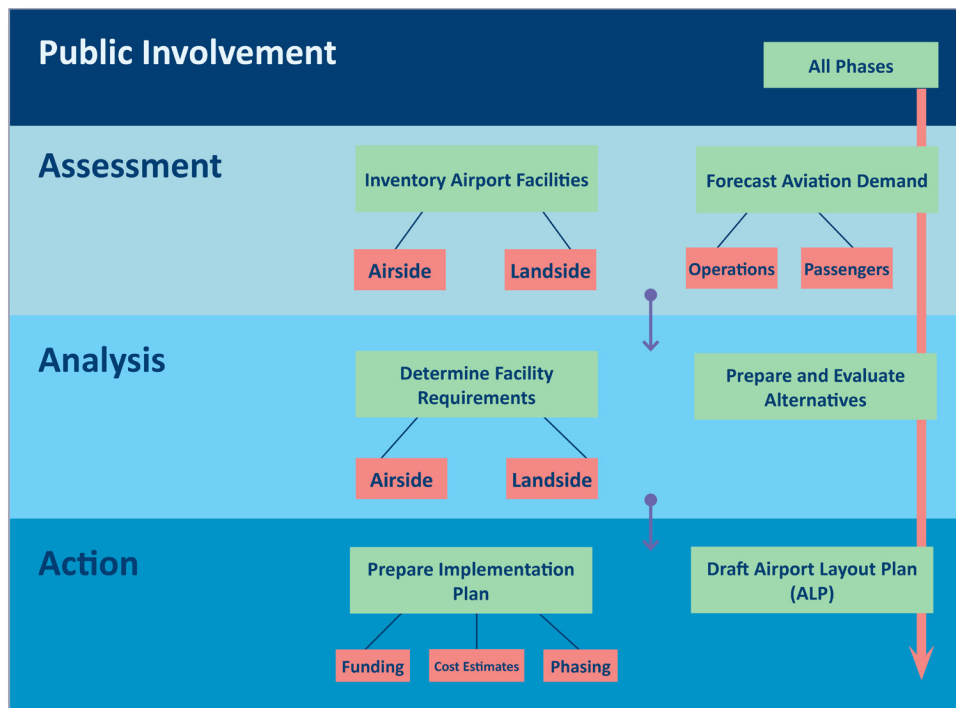
*Why this study matters:*

- ▶ Explains the purpose of airport master plans and identifies when updates are required.
- ▶ Describes key elements of a master plan, from pre-planning through implementation.
- ▶ Emphasizes the importance of stakeholder engagement and community alignment.

The Airport Master Planning Process white paper describes the process used to develop airport master plans as long-range (20-year) planning documents that define an airport’s future development strategy. It explains that airport master plans evaluate existing conditions, forecast aviation demand, identify facility requirements, and assess development alternatives to ensure airports can safely and efficiently meet future operational needs. Central to the process is the ALP, which graphically depicts existing and proposed facilities and must receive FAA concurrence to support eligibility for AIP funding. Although master plans do not authorize construction or guarantee funding, they provide the technical foundation for capital improvement planning, environmental review under NEPA, and coordinated land use and infrastructure decision-making.

The paper emphasizes that airport master planning is both a technical and collaborative effort, involving airport sponsors, local and tribal governments, airport users, industry groups, FAA, and the public. It outlines a structured, phased approach—ranging from inventory and forecasting through alternatives analysis, ALP development, and implementation planning—and highlights continuous public involvement as a core requirement under FAA guidance. By integrating engineering analysis, regulatory compliance, and stakeholder input, the master planning process produces a roadmap that guides future airport investments, supports funding justification, and aligns airport development with community needs and long-term system performance goals.

Read the Full Study: [https://www.alaskaasp.com/media/6089/2026-01-12\\_master\\_planning\\_whitepaper\\_final.pdf](https://www.alaskaasp.com/media/6089/2026-01-12_master_planning_whitepaper_final.pdf)



# The Airport Needs List

## Why this study matters:

- ▶ Explains how DOT&PF tracks airport needs from creation to close-out.
- ▶ Describes how external stakeholders can use the Airport Needs Directory.
- ▶ Identifies common funding sources used to address airport needs.

The Airport Needs List white paper describes how the DOT&PF identifies, tracks, and manages airport infrastructure needs across the state. Development of the Needs List began in Phase I (2008–2013) of the AASP and continued through Phase II (2013–2019). Before this effort, no centralized system for tracking system-wide airport needs existed, creating inefficiencies and redundancies. The Needs List was substantially updated in Phase III (2020–2025) to improve accuracy and usability.

The Airport Needs List, maintained within the AASP, serves as a standardized record of required improvements, repairs, and replacements at airports. Needs are identified through inspections, public input, leaseholder feedback, and staff observations. Eligible projects are incorporated into the ACIP, while non-federally eligible needs are addressed through other existing processes. The public-facing Airport Needs Directory provides transparent information on airport deficiencies, planned projects, and unfunded needs, supporting funding requests and regional planning efforts.

The document also highlights the “Close the Loop” process, in which DOT&PF planners confirm which needs were addressed in a project and upload pictures of the completed project, ensuring that the Needs List remains current. By maintaining a digitized and systematically updated needs database, DOT&PF improves the efficiency of project development, supports strategic allocation of funding, and provides a comprehensive overview of the state’s airport system. The Needs Directory also serves as a planning tool for Tribes, municipalities, and other agencies seeking funding or prioritizing local airport-related infrastructure projects.

Read the Full Study: [https://www.alaskaasp.com/media/6251/airport\\_needs\\_white\\_paper\\_final.pdf](https://www.alaskaasp.com/media/6251/airport_needs_white_paper_final.pdf)

A		B		C		D		F	
						9		19	

Airport Needs in Planned Projects*	Location	Funding	Estimated Cost	Status	Expected Year
Equipment: ST EQ SN: Acquire Snow Removal Equipment (AKIACHAK Grader)	38646	NPE	\$500,000	Programmed	2026
Equipment, Security, and Fencing: ST EQ SN: Acquire Snow Removal Equipment (Acquire Loader (Replace 38548))		NPE	\$500,000	Programmed	2028

\*Several needs may be combined in one project. Funding is planned, not guaranteed.

Additional Identified Needs**	Funding	Estimated Cost	Priority	Need Origination
Airport Master Plan	AIP	\$115,860	Short	Inspection
Apply Dust Palliative	AIP	\$32,458	Short	Inspection
Minor Gravel Resurfacing	AIP	\$347,781	Short	Other
Rehabilitate Apron	AIP	\$585,799	Mid	Other
Rehabilitate Runway	AIP	\$4,710,396	Mid	Other
Rehabilitate Runway Lighting	AIP	\$226,600	Short	Inspection
Rehabilitate Taxiway	AIP	\$588,799	Mid	Other

\*\* Additional Identified Needs are documented and verified but not yet included in a project.

Community Economic Development Needs***	Need Origination
Construct Passenger Shelter	Community
Construct Toilet Facilities	Community
Construct Tie-Downs	Community

\*\*\*Community Economic Development/Quality of Life needs make the airport more viable for reasons of economic development, community comfort (passenger shelter/restrooms) and may be accomplished through community funds combined with other sources such as: Detail Commission, Tribal Transportation, or private sources. Each community solution to these needs will be unique; therefore, the funding source, estimated cost, and priority are not tracked.

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### III. Conclusion

Special studies and targeted research translate complex federal requirements, infrastructure needs, and system performance challenges and opportunities into clear, accessible insights that support understanding of Alaska’s aviation system. By making technical aviation issues more transparent and relevant, these studies strengthen awareness of how airports function and why aviation is critical to communities across the state, particularly in rural communities where aviation is a lifeline.

Through an ongoing program of research, analysis, and system evaluation, the AASP white papers provide a foundation for shared understanding among planners, airport sponsors, and the public. They contribute to long-term system resilience by documenting current conditions and emerging issues, clarifying technical processes and regulatory requirements, and identifying future considerations for Alaska’s statewide aviation network. Future phases of the AASP will update and develop new white papers as the need arises, with topics drawing from public input, staff and consultant needs, and industry trends. Surveys and discussions during Phase III identified advanced air mobility, electric aircraft, and cultural resource management as possible future topics.



Prepared for:



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**Prepared for:**

State of Alaska  
Department of Transportation  
and Public Facilities  
Division of Statewide Aviation  
4111 Aviation Avenue  
Anchorage, Alaska 99502

**Prepared by:**

RESPEC Company, LLC  
2700 Gambell St., Suite 500  
Anchorage, Alaska 99503

**In association with:**

B2Gnow  
Marshall Arts Design

**For more information contact:**

statewideaviation@alaska.gov  
or visit the AASP website at  
[www.alaskaasp.com](http://www.alaskaasp.com)

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Natalie Lyon