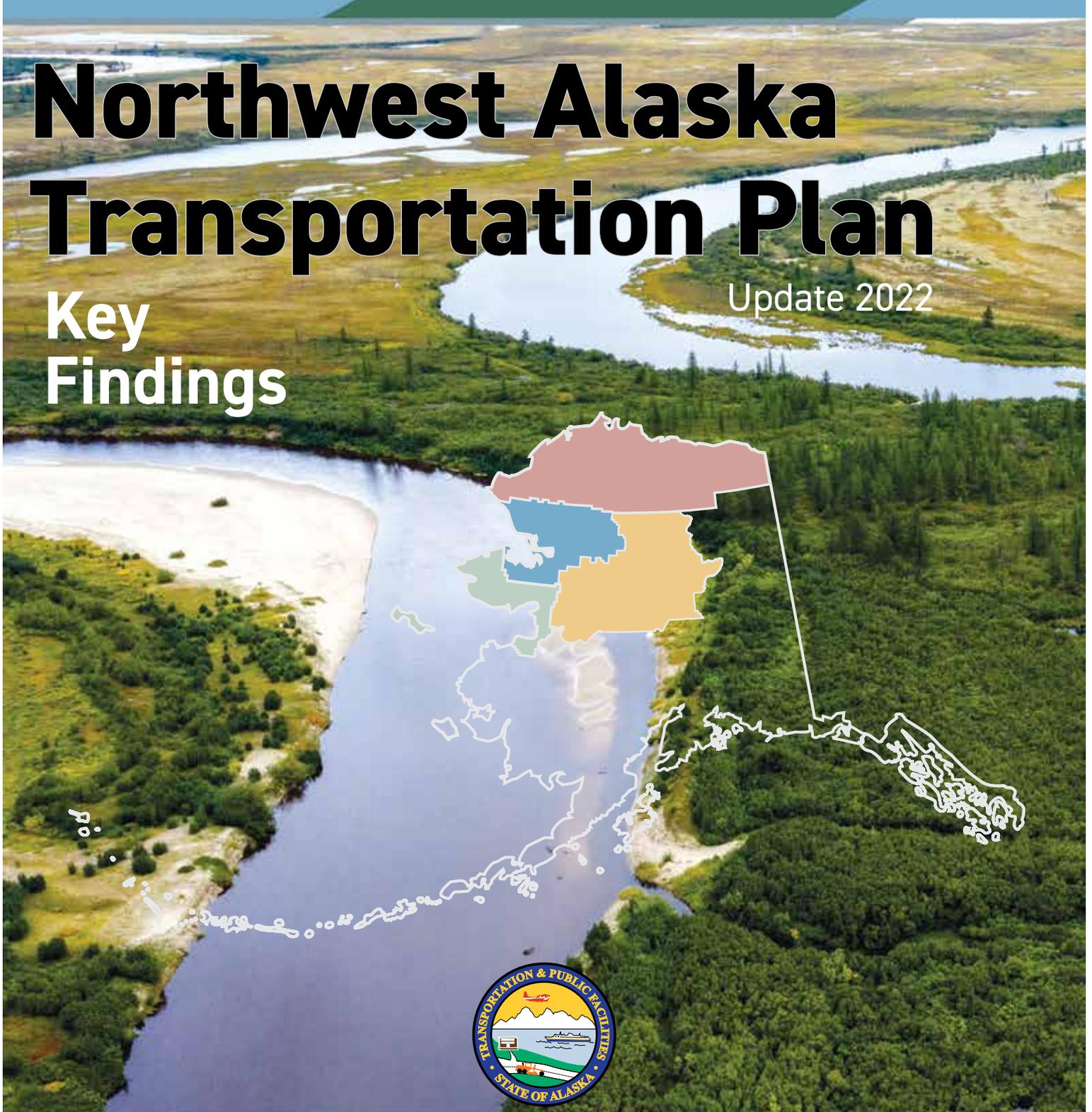


Northwest Alaska Transportation Plan

Update 2022

Key Findings





THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Transportation and
Public Facilities

OFFICE OF THE COMMISSIONER
Ryan Anderson, Commissioner

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April 8, 2022

Fellow Alaskans:

I am pleased to present the Northwest Alaska Transportation Plan (NWATP). This document captures and highlights key recommendations for improving transportation infrastructure in Northwest Alaska over the next 20 years. This plan will guide the development of all modes of transportation throughout the plan area. With tribes, local governments, communities, public agencies and area residents as partners, this plan, combined with new funding programs, creates an opportunity to reshape our infrastructure to support our community's economies, cultures, and industries.

Over the course of the next two decades, funding sources, agency priorities, and regulations will likely change. However, the concepts and recommendations presented in the plan will remain relevant and important. To ensure this is the case, residents and stakeholders should continually review their community's priorities and use the plan to help identify partnerships and resource sharing.

A guiding theme of the plan is resiliency - resiliency in infrastructure; resiliency in transportation systems; and resiliency in the area's residents and communities. As recommendations in the plan are implemented with sound engineering principles that incorporate resiliency measures, the region will become more resilient in light of climate change and fortified against potential disruptions to the transportation network, as well as inevitable changes in funding.

Over the course of the development of the Northwest Alaska Transportation Plan, tribal leaders, residents, business owners, agency staff and many others provided invaluable feedback, through numerous phone calls, emails, virtual open houses and public outreach events. We sincerely thank everyone who has dedicated valuable personal time to this effort. In turn, the department looks forward to assisting the region in implementing the recommendations of the plan as opportunities emerge to constructively shape the region's critical transportation system.

Thank you for your interest in improving transportation throughout Northwest Alaska.

Sincerely,

A handwritten signature in black ink, appearing to read "Ryan Anderson".

Ryan Anderson, P.E.
Commissioner

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Acknowledgments

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Thank you to all the individuals that provided comments, attended community meetings, or stopped by the project booth at conferences. Developing this plan was truly a collaborative process. Thank you to Remote Solutions, the Phase I contractor, for setting the stage for continued public involvement.

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Yukon Bridge at sunset

Introduction

Plan Purpose

Why are we updating the regional transportation plan?

- To identify threats and vulnerabilities in the transportation system
- To guide investment decisions over the next 20 years
- To evaluate regional transportation system needs
- To consider funding options, opportunities, and limitations

The Alaska Department of Transportation and Public Facilities (DOT&PF) is responsible for building and maintaining public transportation infrastructure. As part of this mission, the DOT&PF evaluates transportation needs and applies funding to prioritized projects. Due to the vast geographic area and dissimilarity between regions of the state, DOT&PF both conducts a statewide, long-term transportation plan at a policy level and divides the state into regional planning units.

This plan, the Northwest Alaska Transportation Plan (NWATP) covers a large area of the state. The original plan was published in 2004, and much has changed since then, including the impacts of climate change, volatile oil prices, and renewed interest in mineral exploration and extraction. This plan evaluates transportation modes in the region, examines vulnerabilities, opportunities, and gaps and proposes region specific solutions for a sustainable future.

What is a regional transportation plan?

This document contains primary insights and recommendations for all relevant transportation modes, priorities, solutions, and funding strategies.

What does this plan include?

The Plan

This document contains primary high-level insights and recommendations for each transportation mode and emerging trends.

Technical Documents

A detailed background and discussions on transportation modes, emerging trends, and corresponding recommendations.

Appendices

Documentation of the public involvement process and community profiles that describe community-level transportation needs.

Statewide Long-Range Transportation Plan Multimodal Plan

Statewide Aviation System Plan

Regional Transportation Plans

Highways

10-Year Plan

Metropolitan
Transportation Plan

Aviation

Sub-Regional
System Plans

Airport Master
Plans/Planning
Studies

Funding Plans

Statewide
Transportation
Improvement
Program (STIP)

Airport
Improvement
Program (AIP)

How to use this plan

▶ Agency

Inform regional priorities and guide agency studies and development

▶ Tribal Leader

Guide decision-making on community investments
Help determine funding efficiencies and partnerships

▶ Community Leader

Guide decision-making on policies and investments
Use to nominate capital projects to agencies

▶ Resident

Use as an advocacy tool to improve quality of life in your community

▶ Grant Writer

Use to determine area-wide support when applying for grants

▶ Business Owner

Tool for gauging projected economic activity and opportunities for growth

This plan is meant to be used by state and federal agency staff, tribal leaders, residents, community leaders, grant writers, and business owners to help advocate for project inclusion in the Statewide Transportation Improvement Program (STIP), the FAA Airport Improvement Program (AIP), Tribal Transportation Program (TTP), and U.S. Army Corps of Engineers (USACE) programs, as well as to support locally funded project initiatives.

The contents of this plan include insights from analyses and inform the plan's recommendations. Project advocates can use this plan to engage public officials regarding public transportation investments that affect their communities.

Detailed analyses of elements covered in this executive summary are available in the technical document.

This plan does NOT:

- Commit any agency, community, or tribal entity to implementing recommended projects;
- Override the need for the environmental process and detailed engineering design;
- Preclude development of projects not identified in the plan; or
- Supersede federal, state, or local regulations or standards.

Public Outreach

Listening to the region's voices was an integral part of the plan. Meetings, charrettes, surveys, and newsletters provided communication outlets for understanding the issues, challenges, and opportunities of the region.

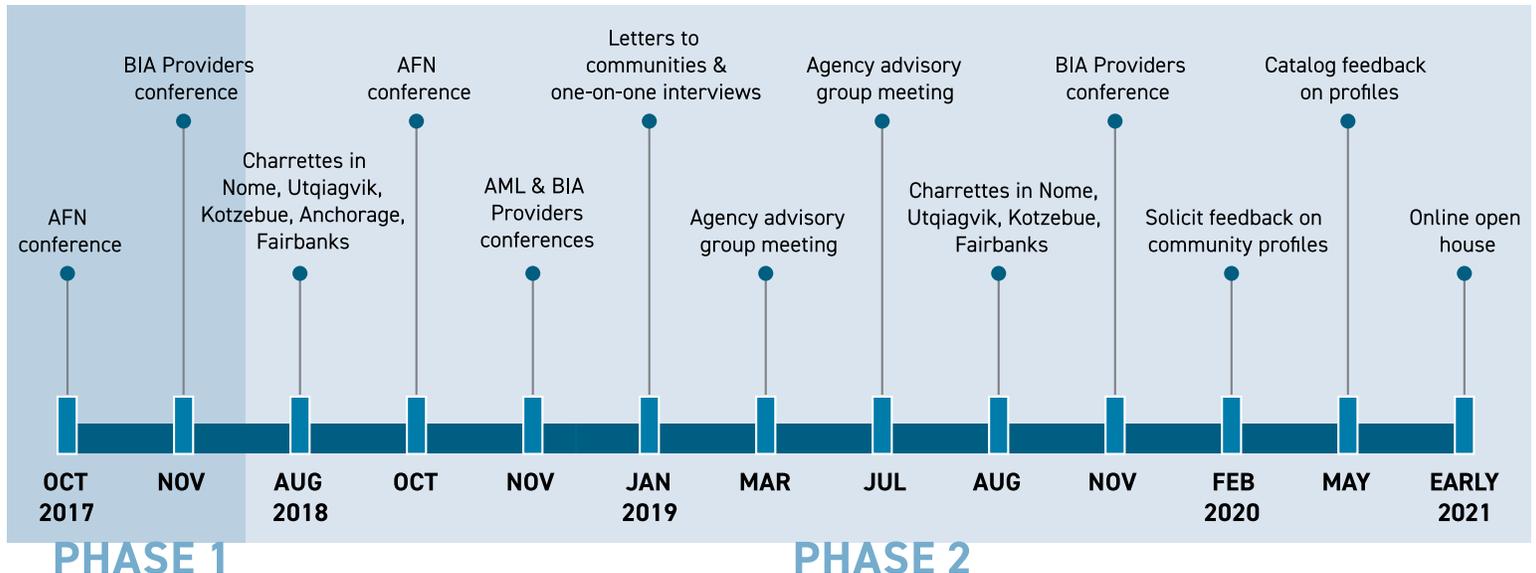
9 regional charrettes

2 agency advisory group meetings

5 conference booths

35+ communities provided feedback

Public involvement timeline



Concerns heard from community members

In order of importance

- 1** Aviation
Global Impact
Marine/Riverine
Roads/Trails
- 2** Runway Conditions
Safety
Safety Education
- 3** Airport Relocations
Arctic Port
Development
Climate Change
Cruise Ship Activity
Equipment Sharing
Evacuation Roads
- 4** Barge Landings/Mooring
Changing Subsistence Fleet
Changing Technology
Community Connections
Dalton Highway Significance
Dust Control
Funding/Project Coordination
Increasing Marine Traffic
Lack of Data
Maintenance
Navigation Improvements
Safety/Security
Snow/Ice Roads
Support Infrastructure
Trail Marking/Shelters/Maps



Kotezebue's Ralph Wien Memorial Airport

Mark Figley DOT&PF



Community meeting in Utqiagvik

Joy Humington

Plan Process



Federal Goals and Guidelines

Federal Transportation Legislation requires states to update their Statewide Long Range Transportation Plan (LRTP) every 5 years. Due to Alaska's size and diversity the state is divided into regional planning areas. This plan informs the LRTP which fulfills federal planning requirements, this plan meets the guidelines and expectations of the State of Alaska's Transportation Planning regulations (17 AAC 05) and Alaska Statutes (19.10.010) Dedication of Land for Public Highways. This plan also follows federal performance measures described in the Alaska Aviation System Plan (AASP) for airport projects.

The national goals for Federal-aid highway program

- (1) **Safety:** To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- (2) **Infrastructure condition:** To maintain the highway infrastructure asset system in a state of good repair.
- (3) **Congestion reduction:** To achieve a significant reduction in congestion on the National Highway System.
- (4) **System reliability:** To improve the efficiency of the surface transportation system.
- (5) **Freight movement and economic vitality:** To improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- (6) **Environmental sustainability:** To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- (7) **Reduced project delivery delays:** To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Policy goals and actions described in the Alaska Department of Transportation and Public Facilities 2036 Long Range Transportation Policy Plan Update

- (1) **New Facilities:** Develop new capacity and connections that cost-effectively address transportation system performance.
- (2) **Modernization:** Make the existing transportation system better and safer through transportation system improvements that support productivity, improve reliability, and reduce safety risks to improve performance of the system.
- (3) **System Preservation:** Manage the Alaska transportation system to meet infrastructure condition performance targets and acceptable levels of service for all modes of transportation.
- (4) **System Management and Operations:** Manage and operate the system to improve operational efficiency and safety.
- (5) **Economic Development:** Promote and support economic development by ensuring safe, efficient, and reliable access to local, national, and international markets for Alaska's people, goods, and resources, and for freight-related activity critical to the State's economy.
- (6) **Safety and Security:** Improve transportation system safety and security.
- (7) **Livability, Community, and the Environment:** Incorporate livability, community, and environmental considerations in planning, delivering, operating, and maintaining the Alaska transportation system.
- (8) **Transportation System Performance:** Ensure broad understanding of the level, source, and use of transportation funds available to DOT&PF; provide and communicate the linkages between this document, area transportation plans, asset management, other plans, program development, and transportation system performance.

FAA goals

FAA strategic goals reflect those of DOT&PF with a focus on the aviation transportation mode. Each goal has overarching objectives and strategies defined by the Department, under which FAA will pursue aviation-specific DOT&PF activities and targets. Common objectives and end states are interwoven throughout each section.

- (1) **Safety:** Reduce civil aviation and commercial space transportation-related fatalities and serious injuries.
- (2) **Infrastructure:** Invest in aviation infrastructure to ensure safety, mobility, and accessibility and to stimulate economic growth, productivity and competitiveness for American workers and businesses.

- (3) **Innovation:** Lead in the development and deployment of innovative practices and technologies that improve the safety and performance of the National Airspace System.
- (4) **Accountability:** Serve the nation with reduced regulatory burden and greater efficiency, effectiveness, and accountability.

Plan Goals & Guiding Principles

Through a series of public engagement efforts early in the project, the team and stakeholders defined the purpose of the plan:

The purpose of the Northwest Alaska Transportation Plan is to improve intra- and inter-regional connectivity, by developing transportation links for access, trade, and local resource development sensitive to traditional values and land uses by the region's peoples. And to improve transportation safety, service, flexibility, and efficiency for users and the state.

Defined Goals

Accessibility

Provide basic access to services

The transportation network should allow residents access to services such as healthcare, education, mail, social services, and other public facilities.

Adaptation

Enhance system adaptability and flexibility

Build resiliency into the transportation network to ensure long-term viability and stability in the face of changing climate, economy, and technology.

Connectivity

Improve community connectivity

Connecting communities to each other, transportation hubs, intermodal facilities, and the contiguous road network can reduce the cost of living, enhance cultural connections, and improve subsistence access.

Economic Development

Support transportation improvements to promote economic development

The transportation network should enable and support local jobs, resource development, tourism, and other economic activities.

Enhancement

Enhance use of the transportation system

Make using the region's transportation network easier and more efficient.

Improvement

Support transportation infrastructure improvements

Develop projects, policies, and practices that enable infrastructure improvements by regional stakeholders.

Middle Yukon River

The Middle Yukon sub-region is part of Interior Alaska, composed of Athabascan and Koyukon villages with deep ties to the land. Three communities in the sub-region are connected to the contiguous road system, while the rest rely heavily on aviation. Barges bring goods in the summer and winter trails provide valuable community connections the rest of the year.

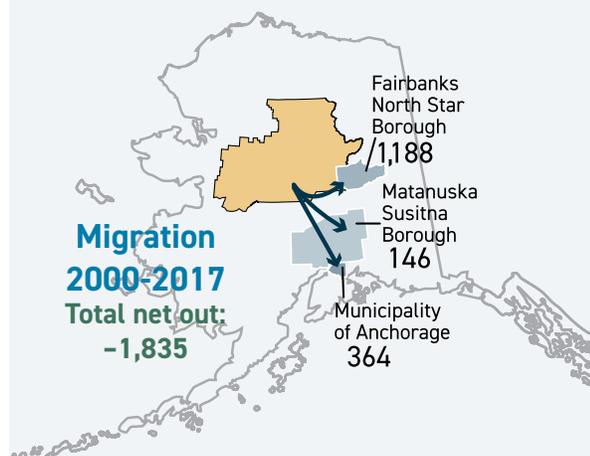
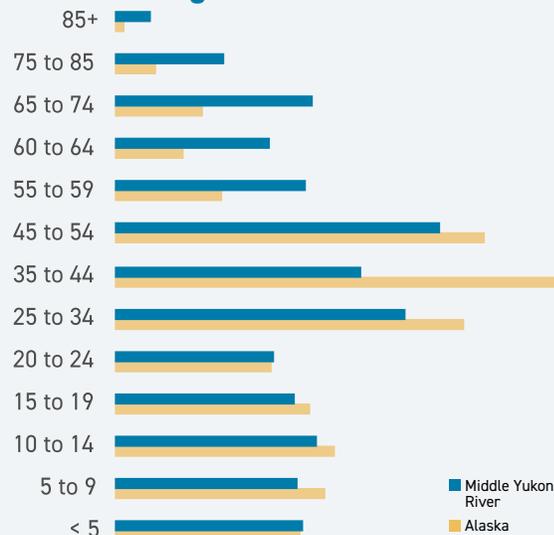
- Recent years have seen flat or decreasing populations, likely due to younger residents moving away for school or job opportunities.
- Resource development and tourism may bring economic opportunities to the region.
- Many communities struggle with erosion and flooding.



Barge Near Tanana on the Yukon River

A few statistics

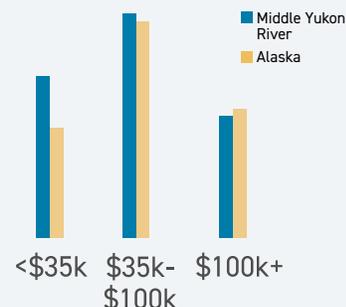
Age Distribution



Population Change 1980-2017 Total change: -22%
3,468 - 2,712

Average Size of Household 2.5 People

Household Income Distribution



North Slope Borough

As the world's largest municipality, the North Slope Borough (NSB) encompasses thousands of square miles of Arctic tundra, coastlines, and mountains. A sparsely populated region, the NSB is home to the Inupiat. This sub-region is on the front lines of climate change, with rapid environmental changes disrupting traditional subsistence activities and damaging critical infrastructure. Although over 2,000 more people have left the region than arrived since the year 2000, the population continues to increase due to high birth rates.

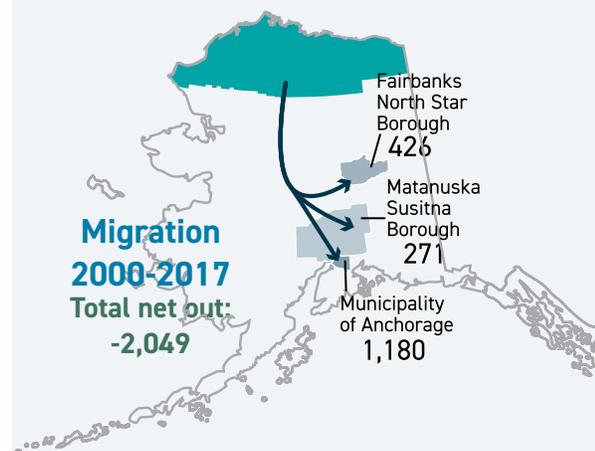
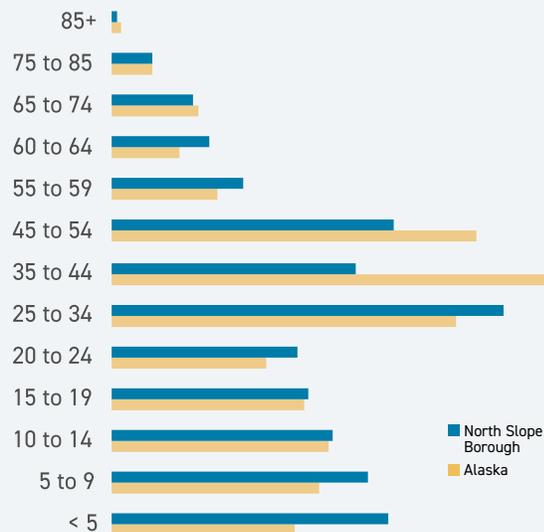


- Rich oil reserves have made the region essential to the state economy.
- The Dalton Highway provides the sub-region's only connection to the contiguous highway system and Railbelt communities.
- The Dalton Highway, originally developed as a restricted industrial "Haul Road," has come to serve as a public highway and tourist destination.



A few statistics

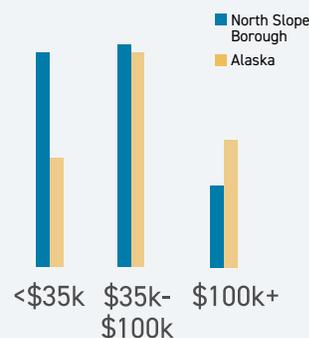
Age Distribution



Population Change 1980-2017 Total change: +104%
3,887 - 7,927

Average Size of Household 3.75 People

Household Income Distribution

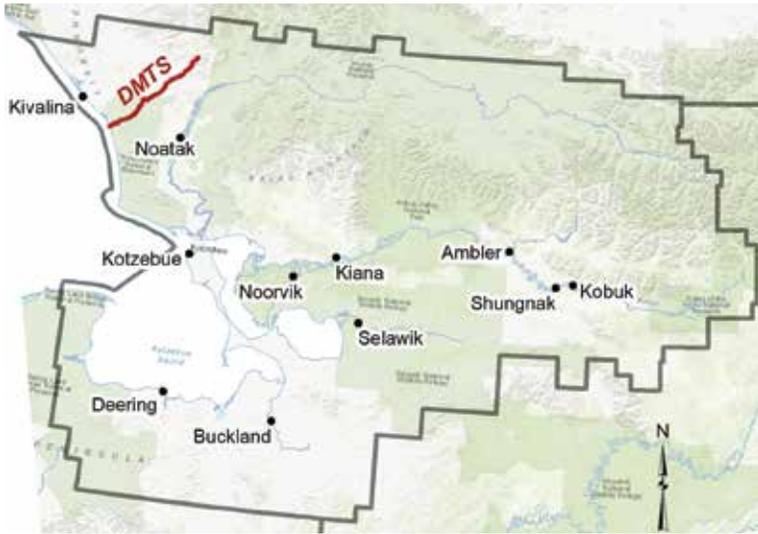


Northwest Arctic Borough



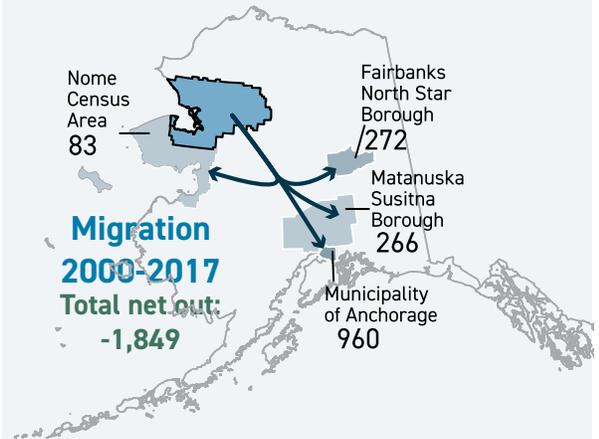
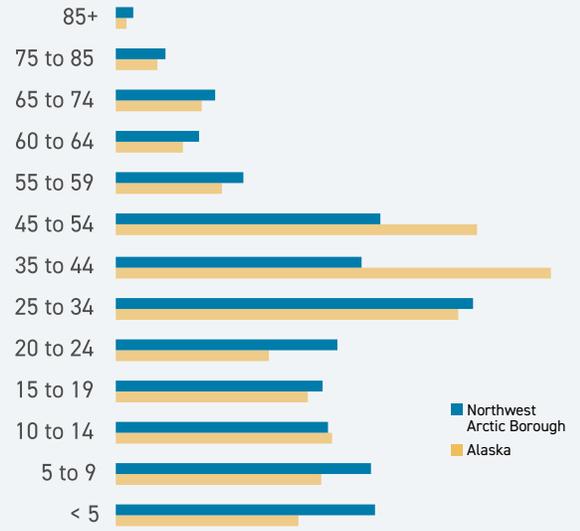
Situated above the Arctic Circle, the Northwest Arctic Borough (NWAB) sub-region includes extensive coastline, lakes, rivers, tundra, and mountains. With no road connections to the contiguous highway system, this sub-region relies on aviation and maritime transportation for the movement of people and goods. Thawing permafrost, coastal erosion, flooding, and less predictable winters challenge the region's people and infrastructure. Although over 1,800 more people have left the region than arrived since the year 2000, the population continues to increase due to high birth rates.

- The Red Dog Mine has long been an economic engine for the region and new mining prospects in the Ambler Mining District provide future economic opportunities and possible road connection to the Dalton Highway.
- Tourism is also a growing part of the economy with significant potential.



A few statistics

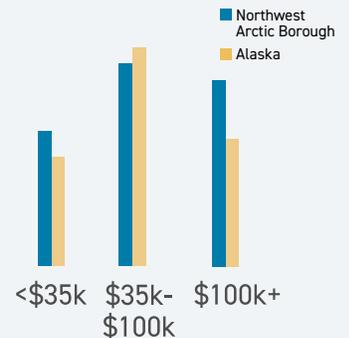
Age Distribution



Population Change 1980-2017
Total change: +58%
4,723 - 7,482

Average Size of Household
4 People

Household Income Distribution

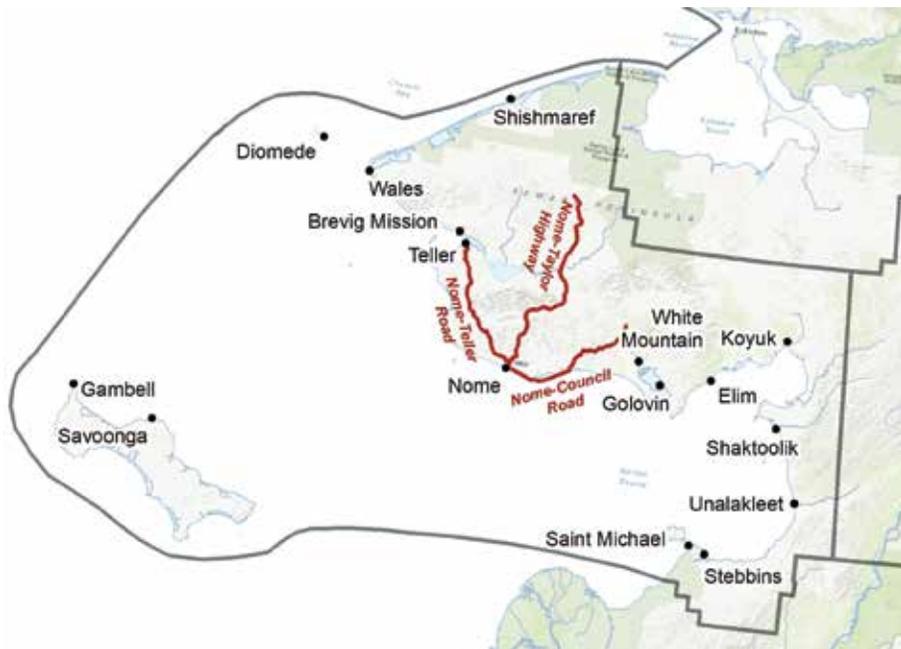


Norton Sound/Seward Peninsula

The Norton Sound and Seward Peninsula sub-region is a geographically diverse area with reasonably well-developed transportation infrastructure. While not connected to the rest of Alaska's road system, the Seward Peninsula has an extensive road network radiating from Nome. The Port of Nome serves a crucial role in the region's transportation system. Increasing national and international interest in the Arctic has elevated the significance of the region's infrastructure and the ability to accommodate more marine traffic transiting the Arctic.



- Mining and tourism provide economic opportunities with considerable growth potential.
- Subsistence continues to dominate village economies.
- Although over 1,500 more people have left the region than arrived since the year 2000, the population continues to increase due to high birth rates.

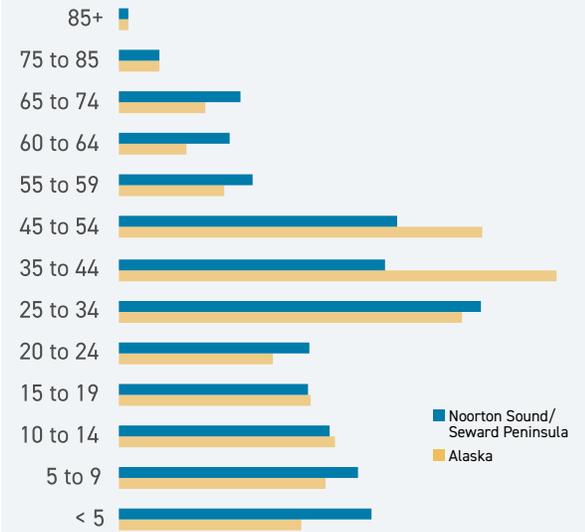


White Mountain

DOT&PF

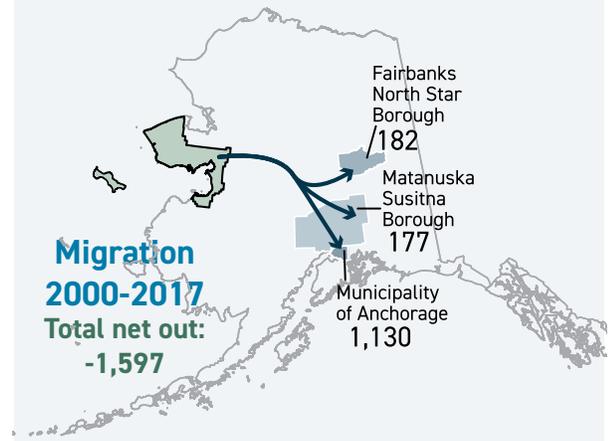
A few statistics

Age Distribution



Migration 2000-2017

Total net out: -1,597



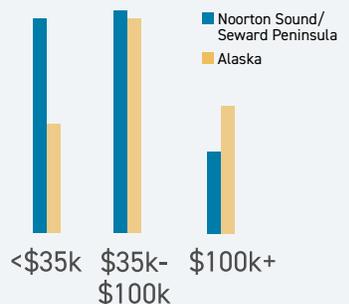
Population Change 1980-2017

Total change: +52%
6,466 - 9,832

Average Size of Household

3.4 People

Household Income Distribution



Region-Wide Challenges

Materials costs can be the biggest driver of construction costs

The quantity and quality of construction materials (e.g., gravel) varies widely across the region. Projects far from a good quality material source must decide whether to work with what's available or import higher quality material. Importing material is incredibly expensive, while working with local materials may shorten the life of the facility and/or create maintenance challenges.

Transportation modes are seasonal

The winter trail season is being shortened due to earlier river break-up and later river freeze-up, causing travelers to forgo development of ice road routes, such as from Kotzebue to Noatak. River barges have a short window of high-water conditions during spring runoff or summer storms to reach upriver communities. The marine transport season has the potential to increase as sea ice recedes. However, there are day length and storm-related issues that could limit access. Aviation, on the other hand, is a primary transportation mode relied on by communities year-round.

The transportation system is vulnerable

As climate changes continue to impact the region's transportation infrastructure, the vulnerability of the transportation network becomes clear. Communities that rely on a single mode of transportation for year-round movement of people and goods are the most vulnerable. The lack of redundancy in the system, reliance on a single mode of transportation, and the need for subsidies inhibit the resiliency of the transportation network.

Region-Wide Opportunities

Resources are being developed

There is potential for communities to have access to industry roads (e.g., Ambler Mining District Roads and DeLong Mountain Transportation System [DMTS]) and provide new system connections/redundancy. Communities could also reuse decommissioned industry roads (e.g., oil and gas service roads).

Arctic tourism is increasing

New travel industry trends for small groups, distanced, outdoor adventure, and sustainable tourism provide opportunities for rightsized tourism growth. Creating opportunities and involving communities to improve resident, visitor, and environmental well-being.

Gravel in rural Alaska can cost up to \$400 a cubic yard, compared to approximately \$22 a cubic yard in other states. Costs add up quickly when large volumes of gravel are needed due to poor soil conditions and the unavailability of suitable construction sands and gravels throughout much of rural Alaska.

The construction of airports in ice- and silt-rich terrain may require construction to occur in phases over several years. The extended period of time and extra effort required to construct the facility can add great cost to the project due to the lengthy commitment of equipment and resources.

Source: Alaska Aviation System Plan

Lack of redundancy in the system

Communities off the contiguous road system cannot choose how their freight or fuel is delivered - air is often the only option year-round, which is more expensive than the seasonal barge service. There are few roads that connect communities to each other, to the contiguous road system, or to major ports/harbors.

Lack of multimodal transportation infrastructure

There is a lack of connectivity between modes that impedes the efficient flow of goods and people. The lack of region-wide connections between modes limits residents' options for travel and the movement of freight. Any break in the system has big consequences - for example, Ravn's 2020 bankruptcy left many communities without scheduled air service.

Heavy reliance on bypass mail

As a federally subsidized program, communities rely heavily on subsidized United States Postal Service (USPS) rates for the delivery of goods. Changes to bypass mail operations can impact the quality of goods shipped to the region (e.g., trucking mail to Deadhorse and then flying to Barrow [Utqiagvik] has led to spoiled produce).

Tribal funding for maintenance is expanding

Federal tribal transportation programs are expanding eligibility to enable funding maintenance on state facilities, presenting an opportunity to supplement dwindling state funding.

Use of Unmanned Aerial Systems (UAS) is being explored

UAS, commonly known as drones, have many possible applications for rural Alaska including delivery of small packages quickly, safely, and cost effectively. UAS package delivery is currently limited to a 75-mile range from the source; although, the technology is progressing rapidly.

Trends

Emerging Trends

Changing climate and the importance of resiliency

Of the top 40 threatened communities in Alaska, 21 of them are in the Northwest Alaska area. These communities have a high combined threat of flooding, erosion, and thawing permafrost.

Stable population growth

Population changes will not likely challenge system capacity over the plan horizon.

Increasing tourism

Arctic cruises and adventure travelers continue to visit the region. Although tourist volumes do not stress the transportation system, they are reliant on multiple modes to visit the region.

Growing interest in the Arctic

The strategic importance of the Arctic has the interest of many nations with the opening of the Northwest Passage and Northern Sea Route to shipping as sea ice continues its retreat.

Resource development potential

Potential mining activities on the Seward Peninsula, the Ambler Mining District, and continued exploration and development of North Slope oil and gas resources should provide positive regional economic impacts.

Unmanned Aircraft Systems (UAS)

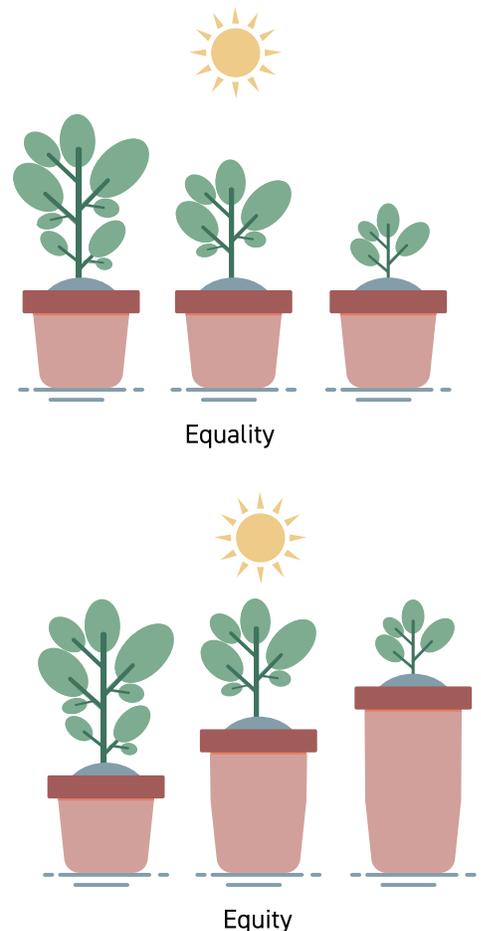
The state continues to work with the FAA, industry stakeholders, and Tribal Governments to develop coastal launch sites and unmanned transition routes; building the foundation for an unmanned transport industry to better serve rural communities.

Transportation Equity

Equity is an important aspect of any transportation project, from the initial planning phase to maintaining a new facility after construction. It is the policy of the Alaska Department of Transportation and Public Facilities (DOT&PF) that no one shall be subject to discrimination on the basis of race, color, national origin, sex, age, or disability. This means accounting for the location and types of transportation that best serves all members of a community.

The term “equity” means the consistent and systematic fair, just, and equitable treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

- **Accessibility:** An individual’s ability to reach life’s broad and diverse places of daily work, play, friends, family, goods, and services. In rural Alaska this includes access to tradition subsistence activities.
- **Equality:** An even or equal distribution of resources.
- **Equity:** Adjusts the level and type of resources so that solutions vary and are appropriate to the groups’ unique needs and preferences.
- **Transportation Equity:** Accessible and affordable transportation for everyone in the community resulting in fair distribution of transportation resources.



Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) was issued in 1994, as an extension of the Civil Rights Act of 1964, with the purpose of focusing federal attention on the environmental and human health effects of federal (and recipients of federal funding) actions on minority and low-income populations. The order also tasks agencies with developing strategies for encouraging and increasing access to public information and participation for traditionally underrepresented populations and communities.

Federal Highway Administration (FHWA) interprets Environmental Justice as, “identifying and addressing disproportionately high and adverse effects of the agency’s (and recipients of federal funding) programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens” (FHWA). The Environmental Justice Strategies outlined by FHWA are:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Transportation policies and investments shall provide access for all through various modes. Equity in transportation should be the foundation on which all transportation work is done. Implementing Transportation equity principles is transformative, improves planning, decision-making, and resource allocation. This results in more equitable transportation policies, programs, and environments for everyone in Alaska.

Infrastructure Resiliency

Resilient infrastructure is able to recover from disruption and continue functioning, even if some elements of the existing infrastructure do not survive. Resilience takes the focus off total protection by balancing vulnerability with risk.

The changing climate is a primary threat to the existing infrastructure system. A warmer climate has already reduced the extent of protective sea ice, opening coastal areas to unprecedented erosion and flooding. Permafrost thaw is accelerating. Building resiliency into transportation infrastructure to mitigate changing conditions may increase costs up front but provides longer term benefits.

The 2019 Denali Commission’s Statewide Threat Assessment report ranked communities by combined threat of erosion, flooding, and thawing permafrost. Six of the top ten threatened communities are in Northwest Alaska. All communities in the region are vulnerable to a changing climate to various degrees.

2019 Statewide Threat Assessment, Community Ranking, Top 40 Most at Risk

NWATP area communities shown in green

1. Shaktoolik	15. Hughes, Huslia	28. Kwethluk
2. Shishmaref	16. Galena	29. Koyukuk
3. Kivalina	17. Circle	30. Kotzebue, Teller
4. Golovin	18. Saint Michael	31. Buckland
5. Napakiak	19. Bethel	32. Gulkana
6. Alakanuk	20. Tuluksak	33. Utqiagvik (Barrow)
7. Newtok	21. Allakaket	34. Elim, Lime Village
8. Unalakleet	22. Akiak	35. Port Heiden
9. Savoonga	23. Napaskiak	36. Nenana
10. Kotlik	24. Chefornak	37. Kongiganak
11. Emmonak	25. Noatak	38. Kipnuk, Quinhagak
12. McGrath	26. Tuntutuliak	39. Kwigillingok, Stebbins
13. Fort Yukon	27. Nome	40. Nightmute, Venetie
14. Deering, Eagle		

Alaska Coastal Resiliency Partnership

The Alaska Divisions of Community and Regional Affairs and Geological and Geophysical Survey are partnering with the Alaska Native Tribal Health Consortium’s Center for Environmentally Threatened Communities to respond to erosion and flooding threats in rural Alaska Native communities.

This partnership will build upon the Denali Commission’s 2019 Threat Assessment of 144 Native communities statewide focusing on 44 of the most threatened communities with respect to coastal erosion and flooding primarily in Western Alaska.

The partnership received funding in late 2020 through a \$1.36 million grant from the National Fish and Wildlife Foundation’s National Coastal Resilience Fund to fund this project. The goal is to prepare more detailed risk assessments leading to the development of informed local resilience strategies, mitigation solutions and the design of future restoration projects. The partners will identify cost effective, culturally sensitive and forward-looking solutions to protect community residents and their infrastructures.

Resiliency Measures

Building resiliency into transportation infrastructure can take many forms. The following are examples that are applicable to Northwest Alaska. Dollar currency symbols (\$) signify relative construction costs.

Application	Protection Method	Cost	Example
	Sheet pile walls	\$\$\$	Kotzebue
	Rock revetments	\$\$\$\$	Kivalina
	Geotextile tubes	\$	
	Geo-textile containers	\$	Kivalina
	Vegetated berms/setbacks	\$	Shakttoolik
	Gabion basket revetment	\$\$	Utqiagvik
	Articulated concrete mats	\$-\$\$	Kotzebue
	Concrete bag revetment	\$	
	Air-conducting embankment (ACE)	\$\$\$	
	Thermal berms	\$\$	
	Insulated embankment	\$\$\$	
	Moisture wicking fabric	\$	Dalton Hwy, MP 197-209
	Embankment above terrain	\$\$-\$\$\$	Dalton Hwy, MP 289-305
	Calcium chloride dust palliative	\$-\$\$	Dalton Hwy, MP 29-100
	Oversized culverts	\$\$\$	
	Thermosiphons	\$\$	Deadhorse SREB
	"Barn Roof" roadway	\$\$	
	Grooved pavement	\$-\$\$	Utqiagvik

\$ Inexpensive
 \$\$ Moderately Inexpensive
 \$\$\$ Moderately Expensive
 \$\$\$\$ Very Expensive

Resiliency Strategies

There are several high-level strategies for communities dealing with large-scale impacts to infrastructure.

Managed retreat

Managed retreat is systematically moving infrastructure away from the threat instead of attempting to hold the line with engineering solutions. It is most often associated with coastal management as a strategy that allows the shoreline to move inland. It can also include relocation of roads or airports away from thawing permafrost, community relocation, evacuation roads, and retreat from eroding rivers.

Protect in place

Protecting infrastructure from threats in place focuses on engineering solutions to keep the threat at bay. The solutions can be categorized as natural (e.g., maintaining barrier islands) or engineered (e.g., breakwaters).

Strategy	Cost	Time-frame	Threats	Example
Managed Retreat	\$\$\$\$	Long-term	Erosion, flooding	Community relocation
Protect in Place	\$\$\$-\$\$\$\$	Short- to mid-term	Erosion, flooding, permafrost thaw	Thermosiphons
Accommodate	\$\$-\$\$\$	Mid- to long-term	Flooding, permafrost thaw	Buildings on pilings

Accommodate

Somewhere between retreat and protect is accommodation. This strategy focuses on infrastructure enhancements that allow the threat to continue, but the built environment accommodates the threat by preventing catastrophic damage. In coastal areas subject to flooding, this may include raising houses up on piers so flood waters can wash in and out without damaging the buildings.

System Preservation

Transportation Asset Management

Transportation asset management is a strategic approach to keep the transportation system in a state of good repair at the lowest life-cycle cost. This approach requires transportation managers to evaluate system needs while considering available funds to optimize the overall health of the transportation system.

As part of this process, transportation managers should evaluate the status of assets, identify risks and vulnerabilities, and consider life-cycle costs. This approach allows the respective agency to determine the best methods to manage and maintain its transportation infrastructure over the long term with the goal of extending the facility's useful life.

Preventative Maintenance

Preventative maintenance slows or delays infrastructure deterioration and maintains or improves the functional condition of transportation facilities without increasing structural capacity. It is a proactive approach to maintaining facilities while they are still in relatively good condition and is performed before the onset of serious damage, delaying the need for major rehabilitation or reconstruction by extending the facility's design life. Although maintenance in rural Northwest Alaska is expensive compared to other parts of Alaska and the US, it is critical to keep the system in good repair.

In Northwest Alaska, the transportation infrastructure is significantly affected by snow, ice, frost heaves, erosion, flooding, and permafrost thaw. Timely and adequate preventative maintenance can prevent minor issues from becoming more substantial, and thus requiring costly repairs. Over time, the cumulative effect of deferred maintenance may spread quickly and shorten the useful life of the facility.

Rehabilitation

Eventually infrastructure needs more extensive improvements than can be achieved through preventative maintenance. Rehabilitation projects are generally designed to restore the structural integrity of the facility with the goal of extending its useful life prior to major reconstruction. It may also address minor changes in standards.

Reconstruction/Replacement

Reconstruction is a major improvement that rebuilds, refurbishes, or replaces a transportation facility while addressing any design deficiencies. These projects occur at the end of a structure's useful life or may be required due to capacity issues, major change in standards, or as the result of a catastrophic event. Ideally, proper preventative maintenance and rehabilitation activities extend the useful life of a facility, allowing for long-term, advanced planning and design of major reconstruction or replacement projects.



Emergency Flood Repair work in Galena

Sean Crites DOT&PF

Preventative Maintenance

Preventative maintenance is the proactive counterpoint to deferring maintenance until there is a failure that requires more costly actions to rehabilitate or reconstruct the facility potentially sooner than its anticipated design life. While there are many factors that can affect the need for transportation facility maintenance, generally the better designed and constructed the facility, the lower the level of ongoing maintenance. Maintenance activities do typically increase over time, even on a well-designed and constructed facility, to ensure continuous long-term operation.

Limited funding, high construction costs, the lack of suitable construction materials, and physical conditions such as poor

soils and thaw-susceptible permafrost often result in facilities being constructed to less robust standards or with sub-standard materials. The result is the need for a higher level of recurring maintenance activities to keep the facility operational.

Deferring maintenance should be avoided. Preventative maintenance is key to the long-term operation of a transportation facility, with the goal of the facility meeting or exceeding its design life. Table 2 provides samples of preventative maintenance activities that can help extend the operational life of a transportation facility.

Preventative M&O Actions	Road Unpaved	Road Paved	Airport Unpaved	Airport Paved	Building	Marine Facility	Erosion Shore/Protection	Frequency
Annual Inspection	•	•	•	•	•	•	•	Annually
Post Storm Inspection	•	•	•	•	•	•	•	Post event
Grading/Maintaining Crown	•		•					As needed
Culvert Clearing	•	•	•	•		•	•	As needed
Vegetation Control	•	•	•	•				Annually
Drainage Ditch Clearing	•	•	•	•				As needed
Crack Sealing		•		•				Annually
Pothole Repair		•		•				As needed
Electrical Inspections			•	•	•	•		Annually
Pile/Deck Inspections						•		Annually
Concrete Spalling Repair/ Sealing					•	•	•	Immediately when found
Dock Fender, Sacrificial Float Wall, or Decking Repair						•		As needed
Erosion or Shore Protection Repairs	•	•	•	•	•	•	•	As needed/ post event
Vehicle Maintenance: Lube, Oil, Filters	•	•	•	•	•	•	•	By manufacturer's recommendations



The Alaska University Transportation Center (AUTC) has many resources available to local and tribal governments that may be interested in establishing their own preventative maintenance programs. The AUTC is also a valuable source of ongoing transportation research in cold climates and publishes new research activities several times a year. Past and new research publications can be found at: <http://autc.uaf.edu/publications/>.

Transportation System Analysis

Aviation

Overview of the Aviation System

Aviation is the primary mode between Northwest Alaska and the rest of the state. It provides year-round access to every community and is the only reliable means of access for a number of them. Federally subsidized air services such as Bypass Mail and Essential Air Service are critical to the region's economy.

Many aviation facilities have been constructed since the 2004 Northwest Alaska Transportation Plan was published. Fourteen runways have been lengthened, three airports have been relocated, and numerous facilities (e.g., snow removal equipment buildings) have been upgraded. Weather reporting is much more widespread and airport weather cameras help pilots with flight planning. Fifty-two of the region's sixty public airports have FAA-installed weather cameras, while forty-six airports have an Automated Weather Observation Station (AWOS), which is critical in providing opportunities for instrument approaches and lower weather minimums for arriving and departing.



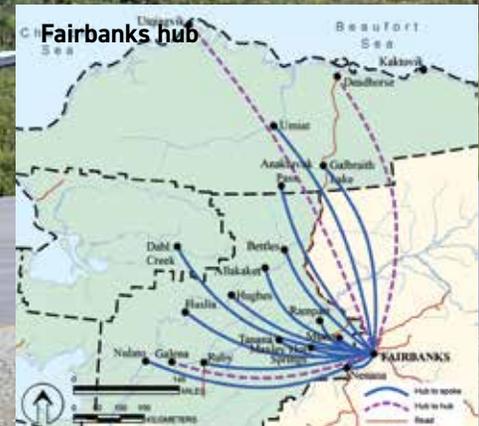
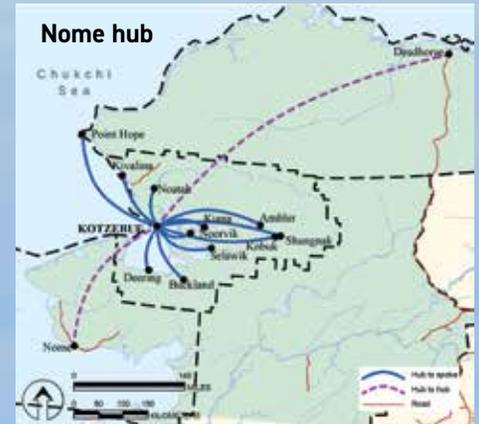
To and from the project area annually

Pounds of mail 79,000,000

Pounds of freight 49,000,000

Number of passengers 484,000

Number of flights 89,000



Nome Airport

JoeSBoylfStock

Challenges to the Aviation System

Changing climate

Warmer winters, permafrost thaw, sea ice retreat, increasingly severe storms, and higher than normal precipitation all contribute to rising maintenance costs and accelerated degradation of airfields across the region. Thawing of unstable permafrost is creating serious subsidence, cracking, and slope failures that result in damage to runways, airport buildings, and lighting systems. Repair or rebuilding, including relocation of infrastructure, is extremely costly. New construction techniques designed to mitigate permafrost thaw are expensive. Additional funding, manpower, and supplies will be necessary to keep these airfields operational.

Funding concerns

As the region's aviation system has developed and matured the demand for funds has exceeded available program resources. Combined with more restrictive eligibility requirements for FAA's Airport Improvement Program (AIP), decreasing revenues create challenges to the ability of airport sponsors to afford the level of maintenance needed to keep airport infrastructure operational. Materials, transportation, and labor costs have been increasing, causing managers to focus their limited operational resources on reactive maintenance, while preventative maintenance activities receive less time and attention. Other regions of the state are experiencing similar cost increases and structural issues due to climate change, which places even more demand on limited funds. Without a dependable non-federal funding source, area airports will have needs that cannot be met through the AIP.

Limited air carrier competition

The challenges associated with operating an air carrier service in the unique environment of Northwest Alaska means that available carriers are limited. As the COVID-19 pandemic has shown, the consequences of a single airline ceasing operations

(Ravn Air bankruptcy) can bring community access to air service to a standstill. Many communities rely on a single air carrier for scheduled service and may be left without air transportation if that carrier stops service. Service can be interrupted due to a carrier going out of business, changes in federal subsidies (e.g., Bypass Mail), or a natural disaster.

Predicted pilot shortage

The COVID-19 pandemic alleviated the pilot shortage almost overnight; however, recent national and international studies predict that it will again become an issue by 2022. The root cause is an aging workforce facing mandatory retirement, fewer pilots exiting the military, and the high cost of training. Local air carriers report the high cost of training and the inability of pilots-in-training to build hours during the shut-down resulted in the shortage becoming an even more pressing issue in northern Alaska. Pilot shortages will continue to challenge transportation growth in the region for years to come.

Bypass mail reliance

As a federally subsidized program, the USPS absorbs the difference between air carrier shipping expenses and standard USPS postal rates. The rural aviation industry relies heavily on Bypass Mail to reduce the cost of supplies in rural villages and ensure passenger service is provided in communities receiving Bypass Mail.

The Bypass Mail program has and will likely continue to undergo heavy scrutiny during the budget process. The USPS is committed to reducing their substantial deficit over the next 10 years and becoming self-sustaining. As of 2019, the Bypass Mail service has survived congressional bills that would have limited the subsidies, likely due to the stiff opposition of Alaska State Representatives. However, continuity of the service is not guaranteed and the program as it exists today is constantly at risk.

Aviation System Opportunities

Federal regulation changes

The FAA Reauthorization Act of 2018 changed federal law regarding the "transfer of air traffic systems." This change allowed DOT&PF and other airport sponsors to design and install Automated Weather Observing Systems (AWOS) and then turn over the system to FAA for ownership and maintenance. This is important because it takes the burden of on-going maintenance off the airport sponsor and provides an alternate way to increase much needed weather reporting equipment installations in the region.

Passenger Waiting Shelters

Passenger waiting facilities are difficult to fund with FAA Airport Improvement Program (AIP) funding, although they are important to rural communities where airports are located a distance from town. Some communities have worked with the DOT&PF to lease a lot on the airport to construct their own shelters. Such facilities may be eligible for "public and charitable" leases.

Trends in the Aviation System

Types of aircraft equipment used

Aircraft serving the region have remained relatively consistent since 2004, except for major carrier upgrades. Alaska Airlines upgraded their fleet from the 737-400 to the 737-700 and 800 and discontinued use of passenger-cargo (combi) aircraft. For the regional carriers, the Cessna Caravan, Beech 1900, and Piper Navajo continue to be the go-to workhorse aircraft for village flights.

Aviation forecast predicts slight growth

Passenger enplanements and aircraft operations will continue to grow only slightly. Average enplanement growth between 2001 and 2017 has been positive (1.0%), and slightly higher than population growth over the same period (0.7%). Changes in enplanement numbers can vary widely from year to year, while changes in the region's population during the same time are much steadier. At most of the regional airports, growth in the number of commercial flight operations was much slower than the growth in passenger numbers. This likely indicates that either larger aircraft were put into service, allowing more passengers per flight, or the existing flights had additional capacity that is now being used, or both.

Aviation access is critical

Increasing tourism and resource development projects rely on aviation to access the region. Passenger volumes for tourism and resource development are currently low, but there is interest and room for growth in these two sectors. Tourists embarking on Arctic cruises often fly into Nome, while a growing number of independent travelers seek access to remote national parks via

chartered aircraft. Large resource development projects such as the Ambler Mining District will require new flights for crew changes and freight shipments. Maintaining and improving the region's airports to meet the critical aircraft requirements is pivotal in allowing the residents to take advantage of these and other, yet unforeseen, opportunities.

Use of Unmanned Aircraft Systems (UAS) explored

Unmanned aircraft systems (UAS) are gaining acceptance in the lower 48 and have the potential to become a viable alternative in rural Alaska. UAS package delivery is currently limited to a 75-mile range from the source; although, the technology is progressing rapidly.

The University of Alaska Fairbanks (UAF) is an FAA selected UAS test site with the opportunity to test and develop applications. The state is working with the UAF Alaska Center for Unmanned Aircraft Systems Integration (ACUASI) to advance the use of unmanned aircraft for mail, cargo, and medication delivery in addition to scientific research, mapping, and environmental analysis.

The FAA Reauthorization Act of 2018 directed the development of a plan to designate permanent areas in the Arctic where small (less than 55 pounds) aircraft could operate. The State of Alaska is actively pursuing the development of guidance for airports, physical infrastructure, and testing of UAS on airport facilities. There are many challenges including cellular coverage, Automatic Dependent Surveillance-Broadcast (ADS-B) coverage, and satellite communications but the potential benefits for Northwest Alaska residents are undeniable.

Gap Analysis – What's Missing, Inadequate, or Failing

Adequate weather reporting, satellite, and cell coverage

Weather reporting equipment (e.g., AWOS) provides critical information to the aviation community, determining how and when aircraft can operate. Dependable low visibility operations also require communication technology (e.g., Remote Communication Outlets) satellite, ADS-B, and cell coverage. The State of Alaska, the FAA, and the aviation industry continue to pursue the addition of equipment, but the NW Region is lacking adequate infrastructure to ensure all-weather access to communities. See appendix for a list of airports that lack AWOSs in the plan area.

Airport repairs and upgrade

Many runways across the region experience seasonal hazards including ruts, frost heaves, mud, erosion, and subsidence. Climate change is degrading runways faster than current funding levels can address. Many airports lack perimeter fencing to control runway incursions, vandalism, and wildlife. Equipment storage buildings are aging, and some are experiencing structural concerns due to thawing permafrost.

Lack of passenger shelters and restrooms

Many airports are located some distance from the community and passenger waiting shelters and restroom facilities are nonexistent at most smaller airports. Some larger commercial airlines provide their own terminal facilities at hub airports.



National Park Service

Roads/Highways

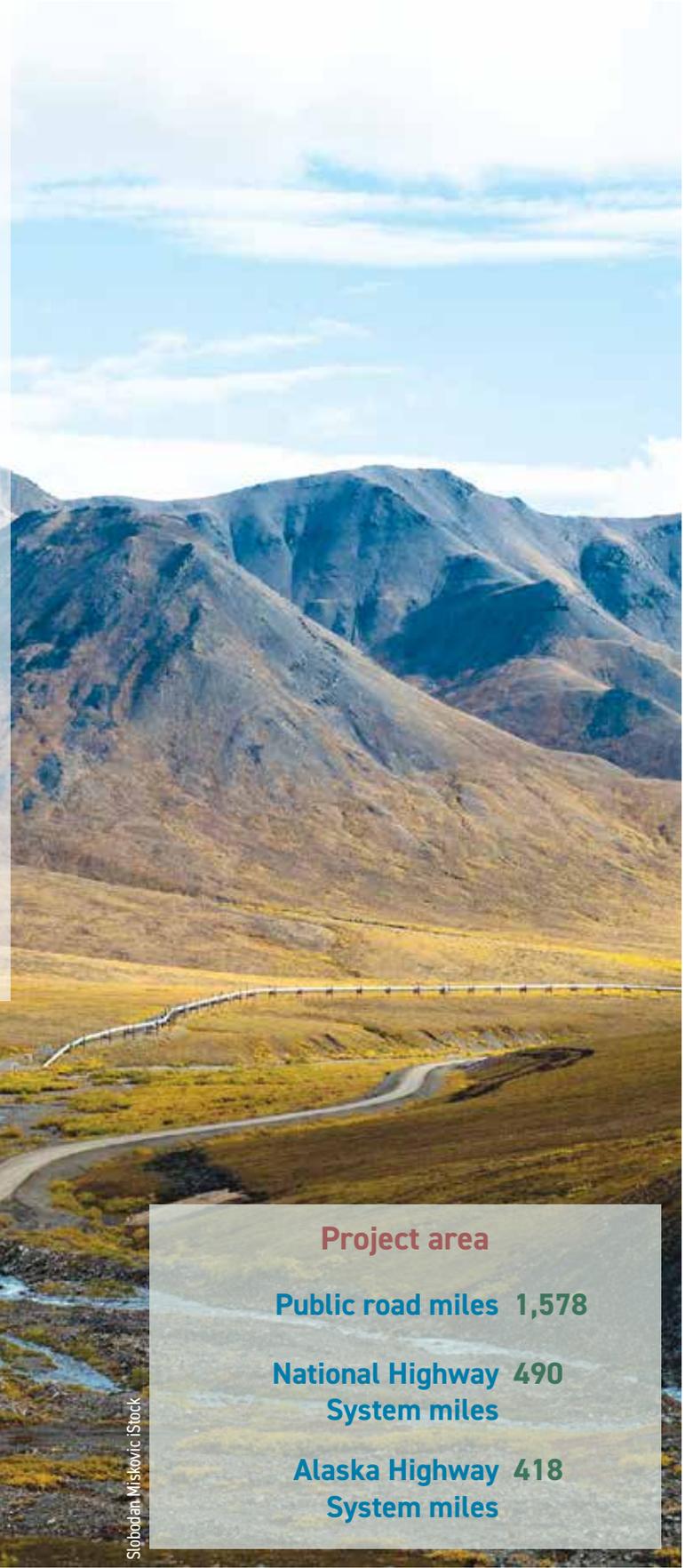
Overview of the Road System

The road system in northwest Alaska is, aside from the Dalton Highway, disconnected from the contiguous road system and the National Highway System (NHS). It is made up of community roads, some regional connections radiating from Nome, the Dalton Highway Corridor, and private industrial roads serving the North Slope oilfields and the Red Dog Mine.

Local roads provide communities with critical intermodal connections to airports and barge landings. Roads also provide access to health clinics, schools, community centers, and other local facilities. The plan area also contains regional roads that connect to outlying communities, natural resources, and subsistence use areas. Private industrial roads connect private resource development projects to the contiguous road network.

Although the Northwest Alaska road system is small in scale, its importance to the vitality of residents and communities is enormous. Without roads to barge landings, community airports, or coastal ports, residents and industry would not be able to connect to the rest of the state and nation via air service, receive bulk cargo and fuel from barges, or ship their product to market.

The Dalton Highway provides a critical service lifeline from the North Slope oil and gas fields to the connected Highway System. These oil and gas operations are vital to State revenues. The Dalton Highway connects to the Parks Highway, linking the region to the Alaska Railroad and Ports of Anchorage, Whittier, and Seward and facilitates Trans-Alaska Pipeline maintenance.



Dalton Highway

Slobodan Miskovic / iStock

Project area	
Public road miles	1,578
National Highway System miles	490
Alaska Highway System miles	418

Challenges to the Road System

Thawing permafrost, erosion, and flooding

Many area roads are built on thaw-susceptible permafrost. Warming ambient and ocean temperatures are accelerating permafrost thaw, causing the ground underneath the roads to subside, wash out, erode, or liquefy. Increasingly frequent severe storms are causing localized river and coastal flooding, creating more erosion and damaging road infrastructure.

Reduction in maintenance budgets

At the state and local level, there is insufficient funding to meet all the maintenance needs. DOT&PF road maintenance and

operations (M&O) activities are primarily funded through the State's General Fund. Between FY2013 and FY2020, DOT&PF has experienced a \$17.8 million (from \$98.1million to \$80.3 million) or 20% drop in maintenance funding from state sources. The State Revenue Sharing Program that traditionally helped fund a variety of community needs, including road maintenance, has not been funded in recent years. Budget constraints also mean local communities often can't afford to purchase new or replace old road maintenance equipment.

Opportunities of the Road System

Community connectivity is gaining acceptance.

Construction of the pioneer Tanana Road in 2016 has provided immediate community benefits. It allows residents to have road access to Fairbanks, which has reduced the cost of transporting freight to Tanana. It has also improved quality of life by improving social connections and reducing the cost of living. Other communities have seen these benefits, and some have expressed interest in potential road connections with adjacent villages or to the contiguous highway system.

"We need equipment and funding for our roads and trails but free money isn't really free. There are many strings attached to grants: strings we can't afford."
NWAB tribal leader



Nome side dumping hopper truck

Trends in the Road System

Sate population expected to remain stable over the next 20 years

Current traffic volumes are low except on some community roads in Nome, Kotzebue, and Utqiagvik where Annual Average Daily Traffic (AADT) volumes range between 2,000 and 4,000. Traffic volumes are not expected to significantly increase over the next 20 years. Road improvements will be needed to address other concerns such as safety, access, and changing conditions instead of capacity and congestion.

Advancement of resource development projects

Resource development potential projects include development of the Ambler Mining District, Graphite One Mine, and the Nenana-Totchaket Agriculture Project. These projects require industrial roads that connect to the existing transportation system. Other resource development prospects, due to their remoteness, may need to develop site-specific, private transportation systems similar to the 52-mile DeLong Mountain Transportation System that connects the Red Dog Mine to its tidewater port. These projects are important to the economic development of Alaska as they will generate state and local revenue and employment opportunities.

As part of the development process, the impacts of these projects on the transportation system need to be addressed. The general concern is the impact that these industrial roads may

have on state maintenance services (i.e., the need for year-round maintenance of state routes that are currently only opened during the summer) or the impact additional industrial traffic will have on the Dalton Highway. Some of these projects have the potential benefit of connecting isolated communities to the highway system via the private industrial road, helping to reduce freight costs and cost of living.

Integrating resilience strategies into the transportation system will reduce vulnerability.

The state is being proactive in addressing vulnerabilities due to a changing climate by designing projects that meet federal Fixing America's Surface Transportation (FAST) Act resiliency requirements. The Federal Highway Administration is supporting these efforts by providing funding for these activities through the FAST Act.

Highway designers are directed to incorporate specific engineering measures to address the impacts of permafrost thaw and other climate-related issues when designing Dalton Highway improvement projects. This directive incorporates resiliency into capital investments with the goal to extend the life of the Dalton Highway.

Gap Analysis – What's Missing, Inadequate, or Failing

Dust control

Most of the roads in Northwest Alaska are unpaved and are a significant source of dust. Road dust causes a variety of problems including reduced visibility, negative health/air quality impacts, and impacts to subsistence food resources and processing. Drier weather conditions are worsening the issue.

Cost and availability of gravel

Road maintenance and construction activity typically require large volumes of good quality gravel making it one of the most expensive project elements. The lack of adequate material sites located near villages often results in material being shipped in at great cost. Identifying quality material sources for local and state use near communities will reduce the cost of Northwest Alaska road construction and maintenance.

Increasing need for evacuation roads

Communities are concerned about how to reduce their vulnerability to extreme weather events. Many communities are advocating evacuation roads that allow residents to evacuate to higher ground to avoid storm surges and related flooding. These roads may also be used to support long-term relocation efforts where necessary.

Communities want to be connected

Road connections between communities can improve social interactions, provide access to alternative airports and barge landings, and facilitate emergency evacuations. Unlike previous planning processes, stakeholders have expressed an interest in having road connections to adjacent communities. Potential connections need to be assessed based on a variety of factors including need, community acceptance, capital costs, maintenance and operating costs and responsibilities, and environmental impacts.

Vehicle maintenance buildings

Many stakeholders have reported that vehicle maintenance buildings are needed to provide a space to maintain and store local maintenance equipment. A maintenance building would have multiple benefits including: storage for tools and other supplies; containment for leaks and spills during maintenance activities; potential reduction to vandalism; and protection of vehicles from weather exposure. The final result would likely be better maintained local roads.

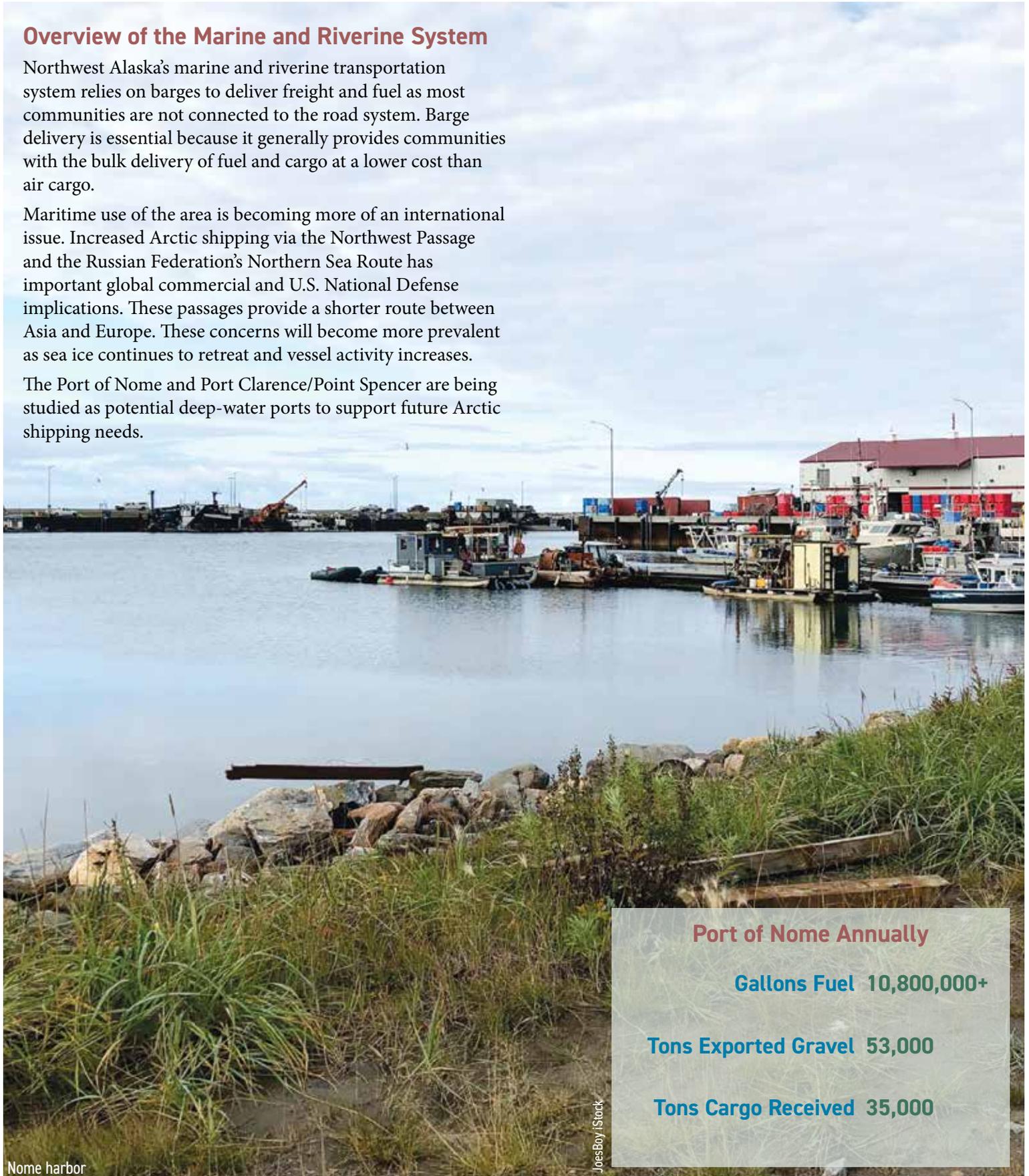
Marine/Riverine

Overview of the Marine and Riverine System

Northwest Alaska's marine and riverine transportation system relies on barges to deliver freight and fuel as most communities are not connected to the road system. Barge delivery is essential because it generally provides communities with the bulk delivery of fuel and cargo at a lower cost than air cargo.

Maritime use of the area is becoming more of an international issue. Increased Arctic shipping via the Northwest Passage and the Russian Federation's Northern Sea Route has important global commercial and U.S. National Defense implications. These passages provide a shorter route between Asia and Europe. These concerns will become more prevalent as sea ice continues to retreat and vessel activity increases.

The Port of Nome and Port Clarence/Point Spencer are being studied as potential deep-water ports to support future Arctic shipping needs.



Port of Nome Annually

Gallons Fuel 10,800,000+

Tons Exported Gravel 53,000

Tons Cargo Received 35,000

Nome harbor

JoeyBoy/Stock

Challenges to Marine and Riverine System

Additional infrastructure needed

To support an increased number of vessels in the Arctic, additional infrastructure and support systems are needed including: deep-water ports; greater coordination among federal and State agencies; improved search and rescue capabilities; improved satellite navigation and communication systems; enforcement of fisheries regulations; law and customs enforcement operations; and U.S. Military and National Security operations to counter the continued interest in the Arctic by Russia and China.

Impacts of changing climate

Coastal communities are experiencing greater severity of winter storms, erosion, and coastal flooding. River communities are challenged by lower water due to a reduced snow-pack and, paradoxically, flooding caused by more frequent and severe summer and fall storms. The overall variability in water levels has made the availability of barge service to upriver

communities unpredictable. For example, Allakaket usually doesn't have commercial barge access due to shallow water. However, conditions allowed barges to reach Allakaket in 2019 and 2020. The other extreme is Noatak, where barge service is no longer available due to seasonally shallow water and the community is now largely dependent on more expensive air cargo services.

Thawing permafrost is affecting barge landing areas and associated access roads. Barge landings have eroded or accreted, requiring operators to be flexible in locating safe and usable landing areas.

“One of [our] concerns is increased vessel traffic near the Bering Strait.”

NSSP tribal leader

Opportunities of Marine and Riverine System

Arctic waters are opening

With sea ice retreating, shipping in the Arctic via the Northwest Passage and the Northern Sea Route is generating international interest to improve trade by reducing transit times between Asia and Europe. This route can reduce shipping time between Europe and Asia by approximately 10 to 14 days, representing a substantial cost savings. Increased Arctic shipping may provide local economic development opportunities. The Port of Nome expansion and potential port development at Port Clarence/Point Spencer are being considered as support centers to meet the needs of increased Arctic shipping and the related deep-draft moorage requirements of commercial, military, and enforcement vessels.

Private partnership opportunities

Partnering with project sponsors may benefit nearby communities through the development of transportation infrastructure to more efficiently transfer cargo or fuel. Chartered barges supporting resource development may have capacity to provide cargo or fuel service depending on a community's proximity to the specific development.

Trends in the Marine and Riverine System

Stable regional population

Cargo and fuel volumes are tied directly to the study area's population and development activities. The capacity of the barge delivery system is by nature flexible to meet changing conditions and is anticipated to be adequate to meet demand over the next 20 years based on current population forecasts.

Changing distribution pattern

Barge operators are now providing more direct service to communities. Rather than bringing fuel and cargo to a hub community where it is transferred to smaller vessels for delivery to the villages, these services are now employing a “mother ship” to transfer cargo or fuel to shallow draft barges for direct delivery to villages. This practice reduces the number of times cargo is handled, the need for upland storage facilities in hub communities, and their associated fees and taxes.

Gap Analysis – What’s Missing, Inadequate, or Failing

Lack of stable funding source

Port and harbor improvements are funded differently from highways and airports. Every year, the federal government grants money to state and local governments from the Highway Trust Fund and the Airport and Airway Trust Fund (fund revenues are generated from excise taxes) to pay for highway and airport improvements. Port and harbor facilities do not have a comparable trust fund. Instead, port and harbor improvements must be developed using different funding sources such as state or community appropriations, bonds, private investment, and Alaska Industrial Development and Export Authority (AIDEA) loans.

Projects typically compete against other projects for funding and often must demonstrate a positive-cost ratio and commit to high level of local match to leverage the agency funds. Since there is no annual funding stream, it may take years, or

decades, to secure enough funding to complete a project. This uncertainty makes it difficult for project sponsors to plan for new projects and improvement. Agencies have recognized the lack of consistent funding as an issue and have been working to develop additional funding opportunities. For example, the proposed America Transportation Infrastructure Act of 2019 provided an opportunity to fund rural barge landing, dock, and waterfront projects. Although the 2019 Transportation Act did not ultimately pass, similar provisions may be part of upcoming bills.

Communicating environmental impacts of the warming arctic on barge landings, ports and harbors to policy makers and providing documentation to support legislative funding efforts will assist in securing funding. These efforts may occur and the state, tribal, or community level.



Grader sunrise, Galena Airport

Winter Connections

Overview of Winter Trails and Roads

Winter trails are a critical element of Northwest Alaska's transportation network. Historically, residents have used these trails to visit neighboring villages, to access hunting and trapping areas, and to move goods. Today these historic trails are still utilized by snowmachines and dog teams to maintain connection between villages and to access hunting, trapping, and recreational areas.

Early miners and homesteaders developed additional trails across federal lands to access gold claims and land. These trails later became protected rights-of-way under Section 8 of the Mining Law of 1866, later redesignated as Section 2477 of the Revised Statutes of 1878 (RS2477). These historic routes exist not only on federal lands, but also on former federal lands which are now held by the State of Alaska or private parties. The Alaska legislature has recognized over 600 of these rights-of-way in statute.

Winter trails are defined as unimproved, cross-country routes across land, sea ice, rivers, and lakes. The Community Winter Trails Program is a federally funded program, administered by DOT&PF Northern Region, that provides funding and support to rural communities to mark public winter trails. Local governments and non-profits in the region participate in the marking program and support emergency shelter construction and trail maintenance.

Winter snow roads are being tested in the region. Snow roads are hard-packed snow roads constructed on frozen tundra to connect villages to the existing road system as a winter option for moving goods. In 2018, the North Slope Borough (NSB) began a 5-year pilot project to develop snow roads between North Slope communities and the Dalton Highway. The goals of the Community Winter Access Trails (CWAT) project are to provide an alternative to air freight and seasonal barge hauling, establish the viability of seasonal overland transportation access, and identify routing for a permanent transportation corridor. Permitted by the Bureau of Land Management (BLM), development and use of these roads is subject to guidelines to protect the tundra, wildlife, and travelers. Vehicles are inspected prior to travel and must travel in convoys.

Other examples of snow and ice roads connecting communities are the Bettles Winter Road connecting Bettles to the Dalton Highway, the Tanana Yukon River ice road connecting the village of Tanana on the north bank to the newly constructed road that terminates on the south bank, and the Kuskokwim Ice Road.

Ice roads are often used on the North Slope for oil and gas development. These roads are privately funded and constructed to accommodate the movement of heavy equipment and oil rigs.

Winter Connections

Miles RS2477 Trails 5,500+

Miles of Winter Trails 3,900+

Miles Historic Iditarod Trails 1,103+



Winter snowmachine trail

Bimmerstam iStock

Trail challenges and opportunities

Climate Change

Changing climatic conditions are impacting winter trails and snow roads across the region. Less stable sea ice and later onset of shore-fast coastal ice is making coastal winter travel more treacherous and less predictable. Kotzebue has been unable to construct ice roads to outlying communities during several recent years. Subsistence hunters on Saint Lawrence Island and in other communities cannot safely travel to traditional hunting areas in warmer winters. The Community Winter Access Trails (CWAT) program was unable to construct the Anaktuvuk-to-Dalton Highway snow road in 2018-19 due to inadequate snow cover and freeze-down conditions along the route.

Extending Roads

As residents of Tanana have experienced, extending a road towards a community can facilitate trail, snow, or ice road opportunities and lower freight costs. Barge and air freight costs to transport vehicles, building supplies, and other heavy, bulky items are greatly reduced when seasonal land connections are available to residents.

Developing RS2477 Rights-of-Way

The Middle Yukon, NWAB, and Norton Sound sub-regions are crisscrossed with RS2477 trails. These trails are pre-1976 rights-of-way, initially established by miners and homesteaders over federal land and later adjudicated by the State and certified in statute. These rights-of-way provide an opportunity to develop additional trails throughout the region.



Arctic Innovation Competition Alaska's Original Idea Contest 2021 Winner

Reinforced Ice with Partially Entangled Hemp Fibers

"When ice is reinforced with hemp fibers, its tensile strength increases more than ten times. I invented and currently have a provisional patent for a method of entangling raw hemp fibers into a uniform cohesive mat that can be easily saturated with water and frozen to create reinforced ice. These hemp mats can be reliably used in constructing

floating ice roads that can safely support tractor-trailers weighing over 70,000 pounds. By adding only 4.2 pounds of entangled hemp to a 350-pound, 8-inch-thick ice beam, the beam was able to support over 2,100 pounds. Without the added hemp, the same ice beam would only have been able to support 150 pounds before breaking. This idea also won the Arctic Kicker Award." *Luke Millam (Fairbanks, AK)*

Trends affecting winter trails

Trail conditions vary widely from year-to-year

There is a significant lack of data on the region's trail network, including condition, usage, routes, and needs. This is likely due to the informality of the trail system and absence of a federal funding program for winter trail design, construction, and maintenance. Areas with the most information are those that also have a trail program administered by the local government or tribal entities.

Winter trails see significant use

Winter trails are the predominate mode of travel between villages when viable. Residents travel to visit friends and family, purchase goods, and access medical clinics.

Warmer winters shorten winter trail season

Later freeze-up and earlier breakup of rivers are shortening the winter trail season. While trails may be in good shape with adequate snow cover, major river crossings are often unsafe and preclude trail travel. Without bridges, travelers rely on consistently cold temperatures to freeze waterways to a safe depth for travel. The Federal Highway Administration recently published an article by Adam Larsen, FHWA Office of Tribal Transportation, and Billy Connor, UAF Arctic Infrastructure Development Center, specific to ice roads in Alaska (Safety on Ice, FHWA, dot.gov)

Snow roads provide options

The Tanana Road and the NSB Community Winter Access Trail program have allowed new overland connections, adding redundancy to the transportation network and reducing costs.

Gaps - what's missing, failing, or inadequate

Bridges

Residents cannot rely on cold weather to freeze waterways for safe travel. Bridges over large waterways can extend the winter trail season and reduce the risk of travelers falling through the ice.

Trail marking

Widespread, systematic trail marking is needed. Not all trails are marked, and some markings are deteriorating. Integrating advanced material for trail marking will ensure longevity of the markers and reduce cost and effort in time.

Emergency trail shelters

Small, simple emergency shelters placed along winter trails enhance safety. Few winter trails have shelters. The region needs widespread trail shelter construction and maintenance.

Funding for trail projects

Trail construction and improvements are funded from a variety of sources which can be challenging to identify and coordinate. State, local, and Tribal governments must utilize an array of funding programs. For example, DOT&PF administers a federally funded winter trail marking and a winter trails online map database through the Community Winter Trails Program. The program provides funding to support rural communities' efforts to mark public winter trails. The National Park Service funds trail construction on federal parklands, and the North Slope Borough has funded projects permitted and inspected by BLM. Additional construction of trails or snow roads is funded through local and/or Tribal governments or privately. As the value of snow roads and trails becomes widely recognized, additional funding opportunities could become available.

	Middle Yukon River	North Slope	Northwest Arctic	Seward Peninsula/ Norton Sound
Safety				
Trail shelter program	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maps/GPS waypoints	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bridges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patrols/convoys	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Trail/condition reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Regional Search and Rescue (SAR) program	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maintenance				
Marking program	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clearing/grooming	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Funding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> Program in place	<input checked="" type="checkbox"/> Partial program in place	<input type="checkbox"/> No program in place	

Kuskokwim Ice Road Case Study



Kuskokwim River

Jorge Moro | Stock

The following case study falls just outside the plan area but serves as an excellent example of how communities, local government and residents work together to improve transportation in remote Alaska.

Identifying a need and finding a solution

Communities along the Kuskokwim River are isolated. Travel in the region is generally limited to airplane, boat, or snow machine. Lack of surface connections contributes to a high cost of living.

To overcome these issues, teams of people from the lower and middle Kuskokwim River work together each winter to build a transportation corridor linking their communities. Led by the Native Village of Napaimute, paid staff and volunteers plan, construct, and maintain an ice road on the river from December through March, or until the ice becomes unsafe. More than 15,000 people live in the Middle and Lower Kuskokwim regions, and this ice road provides them with better connectivity, more

affordable transportation, and enhanced opportunities for economic development.

This route provides improved access to critical services. During medical emergencies, patients can reach the hospital in Bethel when bad weather prevents planes from flying. The Alaska State Troopers use the corridor to serve communities along the river. The U.S. Postal Service even uses this opportunity to deliver mail. Social benefits include being able to visit family and friends along the river and to engage in community events. During the regional high school basketball tournament in March, people from up and down the Kuskokwim are able to attend. More people can participate in the Camai Dance Festival

in Bethel. Chances of being lost or stuck on the ice road are far less than they would be on a winter snowmobile trail.

In 2019-2020 the road extended from Tuntutuliak near the mouth of the Kuskokwim to Sleetmute, 355 miles away. In 2019, a one-way fare cost \$95.00 to fly one person ten miles between Chuathbaluk and Aniak. Using the ice road, a group of travelers with gear could drive from Chuathbaluk to Aniak for the cost of a few gallons of gas.

The ice road supports economic development opportunities, including timber harvesting to produce lumber and firewood. High school students in Kalskag harvest local spruce and manufacture road markers as a class fundraiser for their annual senior trip. Transporting heavy items such as equipment and modular buildings is easier and cheaper using the ice road. Fuel delivery trucks and communications and utility companies use the route as well.

Constructing and maintaining a safe, reliable ice road requires local cooperation and leadership. In the case of the Kuskokwim ice road, this includes Tribal, state and local governments, school districts, search and rescue groups, businesses, corporations, and individual donors and volunteers. Volunteers help with everything from marking the route to providing food and lodging for trail crews. Donations cover the costs of building and maintaining the ice road. Overall coordination and project management is provided by the Native Village of Napaimute Tribal Transportation Department. Search and Rescue groups (SARs) provide the environmental and ice thickness information needed each year before the road can be built. Each winter, local SARs monitor ice conditions and identify hazards. These groups do aerial surveys during the freeze up period and report their findings. The road and trail crews use this information to lay out the safest route.

The ice road is constructed in sections using heavy plows and graders. These sections are linked together, creating a continuous transportation link. Once the road is established, the crews continue the critical work of keeping it drivable and safe. The road has to be plowed, marked, and monitored for changing conditions and hazards. Building a road on the surface of a frozen river involves unique challenges. These include open water, rough ice conditions, shell ice from high water during the initial freeze up, deep overflow on top of the ice during warm weather, wind and drifting snow, and “blow outs” that occur when thickening ice restricts river flow, causing the ice to rupture from the pressure. Local knowledge is crucial in constructing and maintaining a safe route.

Current information about ice road conditions reaches the public through updates provided by local SARs via the internet and text updates. The Bethel SAR provides road reports throughout the season and distributes them on their website as well as on social media. Bethel SAR members also give updates on local radio stations. This information is necessary to alert

Key Findings/Best Practices

- Cooperation by stakeholders is essential to project success.
- A reliable winter travel route is only possible with local knowledge of the route and weather conditions.
- Accurate, real-time communication keeps the public informed of any changes to the ice road.
- Innovative solutions can make the job easier and increase safety. Aerial surveys and ice penetrating radar add needed information about road conditions while saving time and effort. The Native Village of Napaimute Tribal Transportation Department is working to fund a phone application that will allow the public to access ice thickness data in real time.



travelers of potential dangers, especially on weekends when the heaviest traffic occurs.

The Kuskokwim River Ice Road offers an example of successful local leadership and cooperation to provide needed transportation options where state-owned and -maintained infrastructure is lacking.

Transportation Corridors and Access

There are several mechanisms through which the DOT&PF or other agencies could develop transportation corridors to, from, or within Northwest Alaska. The following section summarizes four key statutes and laws that could be used for access.

RS2477

Overview

An assortment of the region's trails was developed as "highways" per the Mining Law of 1866 to access mining prospects across public land.

RS2477 derives from Section 8 of the Mining Law of 1866, a law that was later re-designated as Section 2477 of the Revised Statutes of 1878, or RS2477. The statute simply provided: "...the right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted." Essentially this meant that rights-of-way affixed to routes used for travel, for freight, mail, and transportation of people when the land traversed was unreserved federal land, if that use occurred before the act was repealed.

While lands along a route were segregated from the public domain by entry (e.g., Native Allotment occupancy dates), RS2477s can be discontinuous, skipping over chunks of land for which no historic record of use was established predating the individual dates those parcels were removed from public status.

The Federal Land Policy Management Act (FLPMA) repealed RS2477 in 1976; however, valid existing rights were protected and acknowledged to legitimately exist. In Alaska, RS2477s were established through use or development generally until 1968, which is when most federal land was withdrawn in preparation for negotiation of the Alaska Native Claims Settlement Act (ANCSA) of 1971. RS2477 includes historic routes that exist on federal lands as well as on former federal lands later transferred to the State or private entities. The Alaska legislature has recognized over 600 RS2477 rights-of-way in state statute (AS 19.30.400), although many more may exist.

The most notable RS2477 in the region is the Iditarod Trail, which was used to ferry mail and supplies between the coast and Nome when the land over which it traverses was vacant and unreserved federal land.

When considering RS2477 rights-of-way, it's important to distinguish the historical meaning of highways from the modern. The word "highway" was historically used to refer to foot trails, pack trails, sled dog trails, crudely built wagon

roads, and other corridors for transportation, although case law supports the modernization of such uses to suit today's times.

The broad wording of the law does not limit the type of right-of-way to which the term "highway" applies. Alaska Statute 19.45.001(9) defines a highway to include "...a highway (whether included in primary or secondary systems), road, street, trail, walk, bridge, tunnel, drainage structure and other similar or related structure or facility, and right-of-way thereof..." (Alaska Department of Natural Resources, 2013). There are about 5,513 miles of RS2477 rights-of-way in the NWATP project area. Many RS2477 trail rights-of-way intersect ANCSA and Alaska National Interest Lands Conservation Act (ANILCA) lands. About 35% of the length of these trail rights-of-way intersects ANCSA lands, and about 3% intersect ANILCA lands.

Because Alaska contains so much federal land, private/Native lands, and so many conservation system units through which routes cannot easily be built, understanding and surveying locations of RS2477 routes becomes critical to preserving access ability in remote portions of Alaska. It is important to note that courts have generally adopted a "co-management" philosophy where RS2477s traverse conservation system units such as parks and monuments, giving the government's mandate to protect and preserve its lands weight in the overall management arena. Within such units, courts have recognized the federal government's right to "reasonably regulate" RS2477 uses within federal boundaries, while acknowledging the public's legal right to use and develop them subject to that consideration.

Relevance to the NWATP

The Northwest Area transportation planning area is a large area with few roads, making RS2477 rights of way a valuable access tool that the State will continue to support and defend. Whether some of these routes ultimately serve to unite communities to the maintained road system, allow resource development, or serve other purposes, they are an important historical and legal overlay of corridors connecting communities and places within the region, making access possible. Widely held concerns about high costs of living in rural Alaska and the plan area have made these rights-of-way integral to access considerations in this plan.

PLO 5150

Overview

Public land orders (PLO) are actions implemented by the Secretary of the Interior to make, modify, extend, or revoke land withdrawals. The lands within PLO 5150 are managed by the U.S. Department of Interior's Bureau of Land Management (BLM). PLO 5150 was signed in 1971 to guarantee federal access along most of the Trans-Alaska oil pipeline. PLO 5150 reserved a transportation and utility corridor along the identified Trans-Alaska Pipeline route to control land use and development within the corridor. The intention was to limit non-compatible uses that could adversely affect the security, safety and integrity of the pipeline once constructed and operational. Pipeline construction was completed in 1977, but PLO 5150 remains and limits development along the corridor.

A portion of the Dalton Highway Corridor is located within PLO 5150. The State of Alaska has selected lands along the Dalton Highway within PLO 5150 and is seeking title to these lands to help complete the state's land selections under the Alaska Statehood Act. The State has identified these lands for a variety of purposes including hard rock mining. BLM must modify PLO 5150 before any of these lands can be conveyed to the State.

Relevance to the NWATP

The BLM is currently developing the Central Yukon Draft Resource Management Plan and Environmental Impact Statement. The preferred alternative in the Central Yukon Draft Resource Management Plan and Environmental Impact

Statement recommends a full revocation of PLO 5150, which would allow 2.1 million acres of State of Alaska top-filed lands to become valid selections.

If PLO 5150 is revoked, it is unlikely that access or development along the corridor would change significantly. Alaska Statute (AS) 19.40.210 (Prohibition of Off-Road Vehicles), will continue to remain in force and limit the use of off-road vehicles within five miles of the Dalton Highway right-of-way (with some exceptions). There are other regulations that also restrict access along for corridor. For example, the Alaska Department of Fish and Game does not allow use of motorized vehicles to transport hunters, hunting gear, or parts of game within the Dalton Highway Corridor Management Area except for licensed highway vehicles on designated roads. Should PLO 5150 be rescinded and the State land selections approved, additional planning activity by DOT&PF, the Alaska Department of Natural Resources, and other entities would need to occur to address issues such as improved access and development along the corridor.

The revocation of PLO 5150 would also make access corridors adjoining the highway easier to implement where warranted, with more state control of these decisions. This is significant for communities in Northwest Alaska, which face numerous hurdles to develop such corridors where federal conservation system units and other federal lands classified for land and resource protection impede access potential.

Alaska National Interest Lands Conservation Act (ANILCA) Title XI

Overview

Congress recognized in ANILCA Section 1101 that Alaska's transportation and utility network was largely undeveloped; that it would be extremely difficult to gain approval for projects affecting conservation system units (CSUs) and other conservation areas designated under the Act using existing authorities; and that there was a need for "...a single comprehensive statutory authority for the approval or disapproval of applications..." ANILCA Section 1104 established a detailed process for evaluating transportation and utility systems (TUS) proposed within CSUs and other designated areas

and requires all federal agencies to participate in the process even though other statutory requirements or regulatory guidance may apply to an individual agency's decision.

Relevance to the NWATP

The plan area contains thousands of square miles of CSUs that often separate communities from each other or from the contiguous highway network. ANILCA Title XI is a mechanism for developing road or utility corridors across these federal lands through an established process.

17(b) Access Easements

Overview

Under the Alaska Native Claims Settlement Act (ANSCA), 17(b) easements are rights reserved to the United States which permit public access to cross private lands to reach public lands and/or waterways. The Alaska Department of Natural Resources, Division of Mining, Land, and Water, Public Access Assertion and Defense (PAAD) Unit monitors 17(b) easements to ensure access is maintained.

The easements and their allowed uses are indicated by their width:

- 25-Foot Trail: Includes travel by foot, dogsled, animals, snowmobile, two- and three-wheeled vehicles, and small terrain vehicles (not to exceed 3,000 lbs.).
- 50-Foot Trail: Includes the uses for 25-foot trail plus large terrain vehicles, tracked vehicles, and four-wheeled vehicles (can exceed 3,000 lbs.).
- 60-Foot Road: Uses include that of 25-foot and 50-foot trail plus automobiles and trucks.
- 1-Acre Site: Allowable uses are vehicle parking and temporary camping, loading, and unloading. Temporary camping, loading, and unloading is limited to 24-hours.

Relevance to the NWATP

These easements can be used to develop public roads and trails across private lands throughout the plan area. Roads across private land can provide access to resource development projects, state and federal public lands, and the contiguous road network.

Within Northwest Alaska, there are thousands of miles of 17(b) easements.

17(b) Easement Type	Miles within the plan area
Existing Trail up to 25'	7,245
Existing Trail up to 50'	1,662
Existing Trail up to 60'+	502
Proposed Road up to 100'	250
Proposed Trail up to 25'	573
Proposed Trail up to 50'	472



Anaktuvuk Pass

Blue Barron iStock

Community Analysis Matrix

The following pages provide a high-level graphic representation of transportation deficiencies, potential impacts to infrastructure, and areas needing attention based on an analysis of the network components. This matrix is intended as a checklist for the most critical transportation elements. To review the in-depth analysis and discussion, including population projections, industrial resource projects, climate change impacts, and aviation forecasts, see the Technical Resources document.

The following tables highlight critical infrastructure in each community based on an assessment of the basic elements required for long-term function and sustainability. The categories listed for each community correlate with the goals established at the beginning of this planning process. Severe deficiencies are noted in **red**.

Table categories on following pages

- **Nearest Neighbor:** Nearby neighbors increase the opportunities to build roads and trails, share facilities, and enhance cultural connections. If the nearest neighbor is further away, land-based connections become more difficult to develop and the airport becomes more important to the community.
- **Nearest Road:** A community already connected to the contiguous road system is indicated in the chart as “Y” (yes). Communities located on a road or near a road often enjoy better access to healthcare, education, and public facilities. Communities close to but not connected to the contiguous road system may benefit from a connection, even if it is seasonal.
- **Routine Barge Service:** Availability of regular barge service lowers the cost of goods and fuel, creates increased opportunity for resource development, and supports local jobs. Communities off the contiguous road system without barge service rely solely on air cargo.
- **Adequate Aviation Facilities:** Most communities rely on air travel to access basic goods and services, healthcare, social services, mail, and connect with friends and family. The presence of adequate airport infrastructure is critical to all aspects of life in Northwest Alaska.
- **Flooding:** If the community is susceptible to flooding and all modes of transportation are at risk. The communities need to be engaged in active planning efforts to mitigate flooding and anticipate future risk. Planning now to build resiliency into the transportation system will ensure viable communities in the future.
- **Erosion:** The communities that are experiencing erosion, particularly those that are also subject to flooding, face difficult decisions in the near future. Funding for protection and relocation efforts is available but many communities are competing for limited resources. Many communities in the region have been identified as susceptible to flooding. These communities are indicated with a “Y” (yes) in the following tables.
- **Evacuation route:** A viable evacuation route, particularly for communities that currently experience flooding or are in susceptible coastal tsunami areas, is critical to disaster planning and may also provide a foundation for intermodal connections. Communities on the contiguous road system or away from the coast or a river do not need evacuation roads and are indicated with N/A in the following tables.
- **AWOS (Automated Weather Observing Systems):** FAA-certified aviation weather reporting systems, primarily AWOS, is critical to enabling low visibility aircraft operations. Those communities lacking AWOS systems experience isolation during winter storms and other low-visibility events, placing the entire community at risk. ASOS (Automatic Surface Observation System) is also noted in this category.

Middle Yukon River

Community	Nearest Neighbor (miles)	Nearest Road (miles)	Routine Barge Service	Aviation Facilities Adequate	Flooding	Erosion	Evacuation Road	AWOS
Alatna	1	50	N	N	N	Y	N	N
Allakaket	1	50	N	Y	N	Y	Y	N
Bettles	42	25	N	Y	N	Y	Y	—
Galena	25	185	Y	Y	Y	Y	Y	Y
Hughes	58	103	Y	N	N	Y	Y	N
Huslia	65	135	Y	Y	Y	Y	Y	Y
Kaltag	33	153	Y	Y	N	Y	Y	Y
Koyukuk	15	180	Y	N	Y	Y	N	N
Manley Hot Springs	38	connected	Y	Y	N	N	—	Y
Minto	50	connected	N	Y	N	N	—	N
Nenana	42	connected	Y	Y	N	Y	—	ASOS
Nulato	15	175	Y	Y	Y	Y	Y	N
Rampart	34	24	Y	N	N	Y	Y	N
Ruby	45	115	Y	Y	N	N	Y	Y
Tanana	45	7	Y	Y	Y	N	Y	Y

North Slope Borough

Community	Nearest Neighbor (miles)	Nearest Road (miles)	Routine Barge Service	Aviation Facilities Adequate	Flooding	Erosion	Evacuation Road	AWOS
Anaktuvuk Pass	75	52	N	Y	N	N	—	Y
Atkasuk	60	60	N	Y	N	N	—	Y
Deadhorse	60	connected	Y	Y	N	N	—	Y
Kaktovik (Barter Island)	115	115	Y	Y	N	Y	N	Y
Nuiqsut	60	60	N	Y	N	Y	Y	Y
Point Hope	71	150	Y	N	N	Y	Y	Y
Point Lay	95	180	Y	Y	N	Y	N	Y
Utqiagvik (Barrow)	60	212	Y	Y	Y	Y	Y	Y
Wainwright	60	60	Y	Y	N	Y	N	Y

Severe deficiencies are noted in red.
Refer to Page 36 for category descriptions

Northwest Arctic Borough

Community	Nearest Neighbor (miles)	Nearest Road (miles)	Routine Barge Service	Aviation Facilities Adequate	Flooding	Erosion	Evacuation Road	AWOS
Ambler	24	200	Y	Y	N	Y	Y	Y
Buckland	45	65	Y	Y	Y	Y	Y	Y
Dahl Creek	7	185	N	Y	N	N	N	ASOS
Deering	45	70	Y	Y	Y	Y	Y	Y
Kiana	20	60	Y	Y	Y	Y	Y	Y
Kivalina	44	16	Y	N	Y	Y	Y	Y
Kobuk	7	170	Y	Y	Y	N	Y	N
Kotzebue	48	335	Y	Y	N	Y	Y	Y
Noatak	44	20	N	Y	N	Y	Y	Y
Noorvik	20	43	Y	Y	N	Y	Y	Y
Selawik	20	43	Y	Y	Y	Y	Y	Y
Rampart	7	185	Y	Y	N	N	—	Y

Severe deficiencies are noted in red. Refer to Page 36 for category descriptions



Ralph Wien Memorial Airport in Kotzebue

Seward Peninsula/Norton Sound

Community	Nearest Neighbor (miles)	Nearest Road (miles)	Routine Barge Service	Aviation Facilities Adequate	Flooding	Erosion	Evacuation Road	AWOS
Brevig Mission	7	7	Y	Y	N	Y	Y	Y
Diomedede	26	island	Y	N	Y	Y	N	ASOS
Elim	22	45	Y	Y	N	Y	Y	Y
Gambell	38	island	Y	Y	N	Y	Y	Y
Golovin	15	30	Y	Y	Y	Y	Y	Y
Koyuk	40	75	Y	N	N	Y	Y	Y
Nome	60	402	Y	Y	N	N	Y	Y
Savoonga	38	island	Y	Y	N	Y	Y	Y
Shaktolik	36	80	Y	Y	Y	Y	N	Y
Shishmaref	65	70	Y	Y	Y	Y	N	Y
St. Michael	8	125	Y	Y	N	Y	Y	Y
Stebbins	8	125	Y	N	N	Y	Y	N
Teller	7	0	Y	Y	N	Y	Y	Y
Unalakleet	36	145	Y	Y	N	Y	Y	Y
Wales	26	55	Y	Y	N	Y	Y	Y
White Mountain	20	14	N	Y	N	N	N	Y

Severe deficiencies are noted in red.
Refer to Page 36 for category descriptions.



Erosion Protection on Nome-Council Road

Funding Strategies

Capital Funding

Capital projects build, reconstruct, preserve, and sustain a viable transportation system. Capital projects are primarily funded by the federal government through transportation bills.

Airport project funding is allocated through the Airport Improvement Program (AIP) administered by the Federal Aviation Administration (FAA) which provides grants to public agencies, usually state or local government entities, for the planning and development of public-use airports that are listed in the National Plan of Integrated Airport Systems (NPIAS).

The Federal Highway Administration (FHWA) administers the federal grants program for roads and highways. Ground

transportation projects funded in full or in part by FHWA are administered by the State of Alaska DOT&PF and detailed in the state's four-year Alaska Statewide Transportation Improvement Program (STIP).

Federal funds for shoreline protection, breakwaters, mooring points, and erosion control measures are funded in whole or in part through the U.S. Army Corps of Engineers (USACE) Civil Works Appropriations. Revetments that protect highways, bridges, and airports have been funded through AIP or FHWA.



Emergency repairs on Calena Campion Road.

Shawn Crites, DOT & PF

Airport Improvement Program (AIP)

The Airport Improvement Program (AIP) is a federal grant program that provides grants to public use airports for infrastructure projects related to runways, taxiway, ramps, lighting, weather stations, NAVAIDs, snow removal equipment, and planning. Funds for the AIP come from the Airport and Airway Trust fund, which is supported by airline ticket taxes, aviation fuel taxes, and other aviation related revenue sources. The AIP program is administered by the FAA with guidance and requirements documented in several publications; most notably the AIP Handbook which, along with additional airport project and funding guidance documents, is available on their website at www.FAA.gov.

Grants are available to airport owners or sponsors who are, in turn, required to meet FAA requirements for maintenance and operation of the airport. In NW Alaska, the State of Alaska is the primary owner/sponsor of airports along with the North Slope Borough and the City of Nenana who have accepted the liability and financial responsibility for owning and operating airports in their jurisdictions.

The airport sponsor submits projects to the FAA for AIP funding allocation. Airports owned by the state go through an internal scoring process approved by and in alignment with FAA guidelines to determine project priorities. The state process is known as the Airport Project Evaluation Board (APEB) and scores projects submitted by DOT&PF regional

planning sections. The project nominations are developed with information and input received from various airport inspections processes, M&O personnel working at the airports, input from the community, air carriers, the FAA, state legislature, and other aviation stakeholders. After the project is scored by the six-person APEB board who represent all areas of the state, the scored projects are added to the rural airport system spending plan. The current spending plan has a backlog of over \$1.6 billion in project needs statewide. Average AIP funding for all state-owned rural airports is around 125 million, the graph below depicts the FAA AIP funding history in NW Alaska.

FAA AIP grants cover 93.75% of eligible project costs or 95% in economically distressed areas. Special rules were enacted during COVID to provide grants at 100%. Grant match funds (remaining % of project cost not covered by AIP grant) are provided by the airport sponsor.

Statewide Transportation Improvement Program (STIP)

The STIP is a four-year spending plan that appropriates federal highway and transit funding, in addition to regionally significant state/GO bond funded projects. It is approved by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). The FHWA has several major funding programs that are used in rural Alaska:

Program	Coverage	Federal Portion	Allocation	Example
NHPP	NHS routes	90.97%	Formula	Parks Hwy MP 305-325
STP	CTP, AHS routes, MPOs	90.97%	Formula & Competitive	Kiana community-wide drainage improvements
HSIP	Safety issues	80%	Formula	Parks Highway: Nenana to Sheep Creek Rumble Strip
NHFP	Freight routes	80%	Competitive	Dalton Highway MP 0-9
TAP	Non-motorized	90.97%	Competitive	Kotzebue Third Avenue Sidewalk

Project Funding

With a multitude of different funding programs currently available for transportation projects, it can be challenging to determine the best source or sources for a specific project. Combining several funding sources to complete a project brings additional complexity, including different match requirements, environmental processes, and timelines. To successfully address the backlog of needed projects it is critical for communities to be well informed and creative as they collaborate with multiple agencies to leverage available funding.

The Denali Commission is an independent federal agency designed to increase inter-agency cooperation and leverage funding from various grant programs for rural community projects. In addition to Denali Commission funding for transportation projects, village infrastructure protection, and increased broadband service the Commission employs resources

to assist communities by providing technical assistance, facilitating brainstorming sessions with multiple funding agencies, and assistance in grant writing and administration. Additional information is available on their website <https://www.denali.gov/about/>

The matrix below outlines the common transportation funding programs and the type of projects that generally qualify under the individual programs. There are additional programs and funding sources listed in the appendix. It is important for communities and planners to contact the individual grant programs to determine the latest qualifications and requirements. The federal government provides extensive information, search engines, free training, and listings of available grants on their website at www.grants.gov

Project Type	Common Transportation Funding Programs														
	HSIP	NHPP	TAP	NHFP	FLAP	STBG	FTA	CTP	RTP	Denali Comm.	5339 Funds	TTP	AIP	BUILD Grants	GF
National Highway System	•	•		•	•	•								•	•
Community Roads	•				•	•		•		•		•		•	•
Winter Trails			•		•	•			•	•		•			•
Transit Facilities		•				•	•				•	•			•
Non-motorized Facilities	•	•	•		•	•						•			•
Ports & Harbors										•				•	•
Barge Landings					•					•		•		•	•
Barge Uplands															•
Airfield Upgrades												•	•		•
Airport Passenger Facilities													•		•
Airport Access Roads	•	•			•			•					•	•	•

Addressing Climate Vulnerability in Buckland

The Village of Buckland was identified as one of the most climate-threatened communities out of 44 considered based on a statewide public threat assessment from 2019. The Village of Buckland recently applied for and was awarded a FEMA Building Resilient Infrastructure and Communities (BRIC) grant with technical assistance and support from the Center for Environmentally Threatened Communities (CETC), an extension of the Denali Commission. The project will conduct flooding, erosion, and permafrost vulnerability assessments in Buckland with the FEMA BRIC Grant contributing \$272,500; the Native Village of Buckland will be contributing \$9,130; and the Denali Commission contributing \$24,000 towards the effort.

Community-Wide Road Maintenance in Noorvik

In June 2020, Noorvik Native Community responded to a notice of funding opportunity (NOFO) for Community-wide Road Maintenance funding from the Denali Commission. The Denali Commission received 25 applications for this NOFO, awarding funding to 13 recipients, one of which was Noorvik. Noorvik Native Community received \$75,000 from the Denali Commission and \$11,250 from the Bureau of Indian Affairs (BIA) to implement their community-wide road maintenance program.

Denali Commission

The Denali Commission is an independent Federal agency focusing on the development of basic infrastructure, economic development, and workforce training needs for rural Alaska in collaboration with federal, state, local, tribal, and private partners. The Commission works to capitalize on the authorities granted by the authorizing statute to leverage infrastructure funds and maximizing federal, state, municipal, and tribal coordination efforts for the benefit of rural Alaska. The Commission distributes funding, coordinates with other federal grant programs, and provides technical assistance to rural communities applying for federal and state grants. In 2015 the Commission was directed to establish the Village Infrastructure Protection (VIP) Program to assist rural Alaskan communities threatened by erosion, flooding, and permafrost degradation. As of this writing, the Commission has received no new recurring appropriations for the VIP Program. However, at both the federal and state levels there are indications that the Denali Commission may become an increasingly important avenue for leveraging infrastructure funding in rural Alaska. On June 22, 2021, Alaska Governor Dunleavy reestablished the Denali Commission Transportation Advisory Committee to prioritize rural infrastructure needs in the anticipation of increased incoming federal roads and highway funds. Other entities are currently advocating for a larger role and funding allocation to the Commission as an established organization experienced in coordinating rural projects.

Airport Passenger Waiting Shelter

A local government is allowed to place a public use passenger shelter on an airport lease lot. The lot rent and application fees may be waived if they meet the requirements of Title 17 of the Alaska Administrative Code, Section 45.130. The requirements of this fee waiver include:

- The airport must be the primary form of transportation and serve a community of 25 –1500 residents.
- The land and building may only be used as an airport terminal. No other uses are allowed.
- The land and building must be available for public use.
- The local government may charge user fees in the amount directly associated with the operation and maintenance of the building.

Contact the State of Alaska DOT&PF Statewide Leasing for a complete list of all requirements, submit an application online through the e-Leasing portal, or contact the Northern Region Leasing Office (907) 451-2216 for additional information and assistance.

Tribal Transportation Program (TTP) Funding

FHWA, through its Western Federal Lands Highway Office, and Bureau of Indian Affairs Alaska Office provide funding, technical assistance, and oversight through the Tribal Transportation Program Title 23 C.F.R. Any federally recognized Tribe in Alaska is eligible for these funds. For tribal governments to spend this money, they must have their project identified in a long-range transportation plan and have it added to their tribal road inventory and transportation improvement program. TTP funding can be used for capital improvements, maintenance, and planning for roads, trails, and airports.

Authorized Total Tribal Shares are allocated primarily based on tribal population and miles of road. The FY2020 allocation was \$1,178 per mile. The FY2020 population allocation was \$68 per resident. Each tribe also receives a regional share allocation, transition funding allocation, and supplemental allocation.

Rural Transit Programs

Transit is funded by a variety of public and private sources. The Federal Transit Administration's Non-Urban Formula Grants provide transit capital, operating assistance, and program administration to non-urbanized areas (less than 50,000 in population) for public transportation. The Rural Transportation Assistance Program (RTAP) provides funding to assist in the

design and implementation of training and technical assistance projects and other support services in non-urbanized areas. Federally-recognized Indian Tribes may access Tribal Transit Program funds which are awarded on an annual competitive selection process.

Other Funding

Transportation funding can be solicited from several other sources, including: Alaska Department of Community and Regional Affairs (DCRA) community block grants, and discretionary grants. A complete list of funding sources is in the glossary.

Maintenance & Operations Funding

The adequacy of maintenance and operations funding is a growing concern as volatile oil prices continue to drive budgets lower and material costs such as fuel and gravel move higher. The capital funding that Alaska receives from the federal government has resulted in substantial improvements to highways, marine, and airport systems, however maintenance funding has not kept pace with system growth. Federal transportation programs typically do not fund maintenance or operations; it is up to the individual states and local government owners of the infrastructure to provide adequate maintenance to prolong the life of these systems. Cost of labor and material continues to escalate while M&O budgets decline and deferring maintenance is becoming the norm. Combine lack of maintenance funding with climate change increasingly impacting the stability of existing roads, airports, and buildings and the future of transportation infrastructure is at risk.



Galena airport reconstruction

DOT&PF staff

Project Recommendations

This plan's recommendations cover three levels of transportation infrastructure in Northwest Alaska: 1) Regional Level, which includes policies and infrastructure that apply to the entire NWATP region; 2) Sub-regional Level, which recommends projects and policies specific to one or more of the four sub-regions; and 3) Community/Facility Level, which includes projects for communities' needs identified through the public outreach process. Most community recommendations can be found in the appendix's community profiles.

The following pages summarize recommendations and highlight which plan goals each recommendation speaks to. The goals are defined as below:



Defined Goals

Accessibility

Provide basic access to services

The transportation network should allow residents access to services such as healthcare, education, mail, social services, and other public facilities.

Adaptation

Enhance system adaptability and flexibility

Build resiliency into the transportation network to ensure long-term viability and stability in the face of changing climate, economy, and technology.

Connectivity

Improve community connectivity

Connecting communities to each other, transportation hubs, intermodal facilities, and the contiguous road network can reduce the cost of living, enhance cultural connections, and improve subsistence access.

Economic Development

Support transportation improvements to promote economic development

The transportation network should enable and support local jobs, resource development, tourism, and other economic activities.

Enhancement

Enhance use of the transportation system

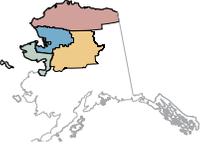
Make using the region's transportation network easier and more efficient.

Improvement

Support transportation infrastructure improvements

Develop projects, policies, and practices that enable infrastructure improvements by regional stakeholders.

Region-Wide



Aviation

Passenger Waiting Shelters

Construct simple, enclosed passenger waiting shelters at community airports throughout the region. Many airports are located some distance from the community and passengers may be exposed to cold, wind, rain, and snow while waiting for their flights. A passenger shelter will provide respite from

the elements and improve the safety of the traveling public. For communities that construct their own shelters, public and charitable leases may be available through DOT&PF leasing.
Plan Goals: Accessibility, Economic Development, Enhancement

Roads/Highways

Atigun Pass Warm Storage Avalanche Control Buildings – Dalton Highway

Construct two warm storage buildings on the north and south sides of Atigun Pass to store DOT&PF's 105 mm Howitzers used for avalanche control for the Dalton Highway through Atigun Pass. Warm storage is needed to keep the Howitzers' hydraulics from thickening/freezing, making the guns less functional/inoperable.

Plan Goals: Enhancement, Economic Development

Dalton Highway Corridor

MP 0-9 Reconstruction

This segment of the Dalton Highway features steep grades and sharp curves that don't meet current design safety standards. This project will relocate the road to more level terrain and will correct substandard geometry and improve freight safety and efficiency. It will also widen the highway to 36 feet, install culverts, improve drainage, and construct a new bridge over Lost Creek.

Plan Goals: Enhancement, Improvement

MP 18-37 Reconstruction

This project will reconstruct the Dalton Highway between MP 18 and MP 37, including drainage improvements, widening, and replacement of Hess Creek Bridge. The project will improve existing steep grades and sharp horizontal curves reducing truck travel time and cost.

This project will enhance safety, performance, and reduce DOT&PF maintenance costs.

Plan Goals: Enhancement, Improvement

MP 109-121 Reconstruction

This section of the Dalton Highway does not meet current design standards. This project will widen, resurface and add resiliency measures to address changing climate conditions along this section of the Dalton Highway.

Plan Goals: Enhancement, Improvement

MP 120-135 Reconstruction

This section of the Dalton Highway does not meet current design standards. This project will widen and resurface the highway.

Plan Goals: Improvement

MP 135-144 Reconstruction

This section of the Dalton Highway does not meet current design standards. This project will widen and resurface the road. The Douglas Creek Bridge (#1560) will also be replaced.

Plan Goals: Enhancement, Improvement

MP 235-289 Rehabilitation

Rehabilitate the Dalton Highway from MP 235 through Atigun Pass to the Kuparek River Bridge (#1943) at MP 289, including drainage improvements, surfacing, and embankment improvements to address potential thawing permafrost and flooding.

Plan Goals: Enhancement, Improvement

MP 289-305 Reconstruction

This section of the Dalton Highway needs to be improved to meet current design standards. This project will widen the highway as well as improve its alignment and grade. This project also includes additional turnouts and snowdrift mitigation features to address drifting snow.

Plan Goals: Enhancement, Improvement

MP 305-335 Reconstruction

This section of the Dalton Highway will be re-graded and widened to improve deficient roadway geometry, and replace the Dan Creek Bridge, install new turnouts, improve drainage, and upgrade signage and delineators.

Plan Goals: Enhancement, Improvement

MP 335-362 Rehabilitation

Rehabilitate the Dalton Highway from MP 335 near Happy Valley Creek Bridge (#4062) to MP 362 including drainage improvements, surface treatments, and resiliency measures to address changing climate conditions.

Plan Goals: Enhancement, Improvement

Elliott Hwy MP 28-47 Rehabilitation – Dalton Highway Corridor

This section of the Elliott Highway is part of the Dalton Highway Corridor. This project will rehabilitate this section of Elliott Highway from MP 28 (just south of the NWATP study area boundary at MP 32) to MP 47. The project includes drainage improvements, paved surfacing, potential improvements to the Tatalina River Bridge (#1400) at MP 42.6 and resiliency measures to address changing climate conditions.

Plan Goals: Enhancement, Improvement

Elliott Highway MP 51-63 Reconstruction – Dalton Highway Corridor

This section of the Elliott Highway is in poor condition. Frost heaving and permafrost thawing has made this segment difficult, and expensive, to maintain. Specific improvements include roadway reconstruction, rehabilitation of the Tolovana River Bridge (#0440), replacement of signage, drainage improvements, and utility relocations.

Plan Goals: Enhancement, Improvement

Elliott Hwy MP 69-72 Rehabilitation – Dalton Highway Corridor

This project will rehabilitate the Elliott Highway from MP 69 to 72 including improvements to its intersection with the Old Elliott Highway at MP 71, drainage improvements, repaving, and replacing Livengood Creek Bridges 1434 and 4034. It will incorporate resiliency measures to address changing climate conditions.

Plan Goals: Enhancement, Improvement

Rural Alaska Crash Data Collection – Dalton Highway Corridor

Expand crash data collection efforts and coordinate the consolidation and cataloging of crash data throughout the region. Highway and off-road (ATV, snowmachine) crash data is not collected on a consistent basis in rural Alaska. This gap impacts the ability to establish trends, recommend solutions, and obtain federal grant funding. Expanding data collection requires a coordinated effort between state, local, and Tribal entities, as well as comprehensive public outreach effort.

Plan Goals: Enhancement, Improvement

Marine/Riverine

Barge Mooring Points Program – Denali Commission

Support continued funding of the Denali Commission/USACE Barge Landing Mooring Points Program in Northwest Alaska.

Plan Goals: Adaptation, Improvement

Port Clarence/Point Spencer Development

Develop a deep-water port in Port Clarence in tandem with the reuse of the USCG's former communication station and airfield. Port Clarence offers protection from sea storms and can serve as a port of refuge for vessels. Protective structures will likely be needed if the port is to serve commercial fishing vessels, USCG enforcement vessels, and other smaller coastal watercraft to provide safe moorage.

Plan Goals: Adaptation, Economic Development, Improvement

Port of Nome Development

Expand the Port of Nome to at least -40 Mean Lower Low Water (MLLW) to service increased Bering Strait ship transits and the opening of the Northwest Passage and Northern Sea Routes. As more and larger ships access this area, there's an increasing need for a deep-water port to accommodate these ships.

In May 2020 USACE approved the Nome port expansion. The project is now planned to be constructed in three phases. Phase I expansion estimated cost is now \$505 million. City of Nome and USACE are currently working on the design, expected to be completed in early 2023. If funding can be secured, construction can start as early as 2023.

Plan Goals: Adaptation, Economic Development, Improvement

Winter Trails

Trail Bridge Program

Create a comprehensive program that provides planning, design, and construction of trail bridges. The program should include a mechanism for funding the design and construction of bridges to extend the season for winter trails. The program should identify and map potential bridge locations and establish a priority list of locations.

Plan Goals: Connectivity, Enhancement

Trail Shelter Program

Develop a trail shelter program that identifies and maps locations for emergency trail shelters that can be used by the

public when traveling via winter trail between communities. Trail shelters are only found in parts of Northwest Alaska and there is no region-wide program to site, design, construct, and maintain these important facilities.

Plan Goals: Connectivity, Enhancement

Winter Trail Mapping

Institute comprehensive, systematic mapping of the region's winter trail network to provide the traveling public with GPS routes and way-points, as well as aid in search and rescue operations.

Plan Goals: Connectivity, Enhancement

See page 45 for definition of plan goals.

Multimodal

Alaska Coastal Resilience Partnership's Assessment Support

Support the Partnership's effort to complete site-specific data collection, risk assessments, planning, and design efforts to address coastal flooding and erosion in Northwest Alaska's most threatened communities. Transportation managers and community and tribal officials should collaborate on efforts to collect detailed information and propose site specific fundable solutions.

Plan Goals: Adaptation, Improvement

Dust Control Best Practices Toolkit

Consolidate dust control best practices for communities, health consortiums, and transportation agencies including palliatives, equipment modifications, and educational tools

in a single, easy-to-update website. There is no one-size-fits-all solution, and some practices may work better when combined with others. A toolkit provides local maintenance authorities with a palette of options that they can tailor to their situation.

Plan Goals: Adaptation, Enhancement

Material Source Database

A single, GIS-based, online database with information about the quality, quantity, ownership, and accessibility of material sources would help during project development to determine if suitable material was near projects slated for development. This would help with cost estimating and potentially reduce the cost of remote construction projects if contractors had access to this information during bidding.

Plan Goals: Adaptation, Improvement

See page 45 for definition of plan goals.



Dalton Highway

TroutNut iStock

Middle Yukon River



Aviation

Airport Weather Camera Installations

Install additional weather cameras at Hughes, Koyukuk, Manley Hot Springs, and Rampart to provide greater geographic coverage of local weather conditions, and improve general aviation safety. This is a priority issue for the Aircraft Owners and Pilots Association (AOPA) in Alaska, as well as with the Alaska Aviation System Plan's Aviation Weather Working Group.

Plan Goals: Accessibility, Connectivity, Enhancement, Improvement

Automated Weather Observing Stations (AWOS) Installation

Install AWOS at Allakaket and Koyukuk airports to provide opportunities for improved weather minimums and general aviation safety, in accordance with AASP recommendations.

Plan Goals: Accessibility, Connectivity, Enhancement, Improvement

Bettles Airport Improvements

Resurface the runway, apron, and taxiway. Replace the airport lighting, apply dust palliative, and address airspace obstructions.

Plan Goals: Enhancement, Improvement

Hughes Airport Improvements & SREB

This project will raise the grade of the runway and relocate the apron to address the current flood threat. Apply dust palliative on all operational surfaces. Construct a new snow removal equipment building (SREB) outside the runway protection zone (RPZ) and flood-proof the building. Repair/replace the airport lighting system.

Plan Goals: Enhancement, Improvement

Manley Airport Improvements and Apron Construction

Construct a new apron adjacent to the existing snow removal equipment building (SREB) pad. Construct General Aviation (GA) aircraft tie downs on the new apron. Construct new taxiway. Install medium intensity taxiway lighting and apron lighting.

Plan Goals: Enhancement, Improvement

Ruby Airport Reconstruction

Reconstruct the airfield to meet new standards. Address existing road traversing the airfield within the lateral safety area, along with line of sight issues.

Plan Goals: Enhancement, Improvement

Roads/Highways

Eureka-Rampart Road Connection

Connect the community of Rampart to the Elliott Highway with a pioneer road via the Eureka-Rampart Trail and the Eureka Road. A "pioneer road" will provide Rampart residents a reliable connection to the contiguous road system and the Fairbanks service and supply center.

Plan Goals: Adaptation, Economic Development, Improvement

Manley Bridge Replacement – Elliott MP 156

Design and construct the replacement of the existing Manley Slough Bridge #242.

Plan Goals: Enhancement, Improvement

Nenana 6th Street Extension to Suckling Road

Extend 6th Street west to Suckling Road and improve Suckling to current standards to provide more direct vehicle and pedestrian access from downtown Nenana to the existing small boat launch.

Plan Goals: Enhancement, Improvement

Nulato-Koyukuk-Galena Road Connection

The Western Alaska Access Planning Study recommended a connection between Galena and Nulato that would include a

connection to Koyukuk. This road would provide better access to job opportunities, education, and services in Galena as well as improve social connections (see page 60 for more information).

Plan Goals: Accessibility, Adaptation, Connectivity, Economic Development, Improvement

Parks Highway Reconstruction MP 319-325

Rebuild the road section to support heavier loads without seasonal restrictions, improve drainage, correct geometric issues, add new passing lanes and truck climbing lanes.

Plan Goals: Economic, Improvement

Parks Highway/City of Nenana 6th Street Streets Intersection Improvements

The Parks Highway/6th Street Intersection provides access to the Port of Nenana which provides barge service throughout the Middle Yukon Area. This intersection should be reconfigured to provide more effective access to the city and its port.

Plan Goals: Adaptation, Economic Development, Improvement

See page 45 for definition of plan goals.

Parks Highway/City of Nenana 10th Street Intersection Improvements

The Parks Highway/10th Intersection provides access to the new Nenana River bridge at the Totchaket Road. Future improvement to this intersection will provide more efficient access to the Totchaket Road and the Totchaket Agricultural area and potential mineral and oil and gas developments.

Plan Goals: Adaptation, Economic Development, Improvement

Ruby Slough Road Phase II Final Design and Construction

Reconstruct and rehabilitate Ruby Slough Road from Ruby Slough to the Ruby-Poorman Road. Work includes road rehabilitation, drainage improvements, and roadside hardware.

Plan Goals: Enhancement, Improvement

Tanana Road Upgrades

Upgrade the recently completed single-lane pioneer Tanana Road to minimum two-lane standards. Extend a new section of pioneer road on the north side of Yukon River east to a location opposite the Tanana Road.

Plan Goals: Adaptation, Economic Development, Improvement

Totchaket Road Extension Construction

Construct the 28-mile extension of the Totchaket road on the west side of the Nenana River to provide access to natural resources and important agricultural land. This road has been planned since the 1980s and will provide new growth and economic opportunities for the region.

Plan Goals: Economic, Improvement

Marine/Riverine

Nenana Small Boat Harbor Development

Develop a protected small boat harbor in the vicinity of Nenana's boat ramp on the Nenana River to facilitate the safe moorage, boat haulout, and launching of vessels. This boat harbor would serve Nenana and Middle Yukon residents, sport fishing, hunting, and subsistence activities.

Plan Goals: Adaptation, Economic Development, Improvement

Winter Trails

Winter Trail Marking

Mark winter trails between the following communities:

- 1) Huslia, Galena, Hughes, Koyukuk, Selawik (164 miles)
- 2) Galena and Koyukuk (90-120 miles)

Plan Goals: Connectivity, Enhancement

See page 45 for definition of plan goals.



Koyukuk River, Hughes

► North Slope Borough



Aviation

Barrow Airport Apron Expansion

Extend the north airport apron to the south. Extend the north airport apron to the east.

Plan Goals: Enhancement, Improvement

Deadhorse Airport Perimeter Fence Installation

Extend the existing fencing to construct a continuous perimeter fence at the Deadhorse airport.

Plan Goals: Enhancement, Improvement

Deadhorse Apron – Taxilane Expansion & Drainage Improvements

Expand the main apron, and add taxilane, and fill in infields at the airport. Improve drainage.

Plan Goals: Enhancement, Improvement

Point Hope Airport Relocation Study

Point Hope Airport is threatened by coastal erosion. A comprehensive relocation study will identify potential relocation sites in the event erosion accelerates. It will also document environmental impacts, assess material sources, and outline planning-level cost estimates. The relocation study will serve as a precursor to the NEPA process.

Plan Goals: Accessibility, Adaptation, Connectivity, Improvement

Roads/Highways

Point Hope Evacuation Road

Locate, design and construct an evacuation road to serve Point Hope. More frequent storm surges, flooding, and erosion threaten the community and the airport. An evacuation road provides residents an emergency route to safer ground during these events.

Plan Goals: Adaptation, Improvement

Support the Reuse of Oilfield Service Roads

Work with Alaska Department of Natural Resources (DNR) and the NSB to develop a process to secure the future public use of industrial roads that directly facilitate community connectivity (e.g., the Spine Road that provides access to oil and gas fields west of the Dalton Highway). The North Slope is crossed by 413 miles of oilfield service roads. Current regulations and permits require oilfield service roads to be removed when the oilfield is decommissioned. Converting some of these roads to public rights-of-way at the end of their permitted industrial use would provide communities with access to the Dalton Highway.

Plan Goals: Adaptation, Economic Development, Improvement

Marine/Riverine

Utqiagvik Storm Damage Protection

Assess, design, and construct coastal protection measures to protect Utqiagvik from storms. Erosion is threatening infrastructure such as roads, utilities, residences, and businesses and the community has taken emergency measures to reduce the impacts of erosion. The USACE and City of Utqiagvik are assessing the feasibility of coastal revetments to reduce erosion.

Plan Goals: Adaptation, Economic Development, Improvement

Winter Trails

Continue Community Winter Access Trails Program

The CWAT program provided new opportunities for NSB residents to move goods and materials to, from, and within the region. Winter snow roads were constructed to Anaktuvuk Pass, Utqiagvik, and Nuiqsut to provide overland connections to the Dalton Highway. Additional years of CWAT will provide additional opportunities, as well as the data needed to analyze the economic benefits of the program. Based on an analysis of the benefits, the CWAT program may serve as a precursor to all-season trail connections.

Plan Goals: Adaptation, Economic Development, Improvement

See page 45 for definition of plan goals.

Northwest Arctic Borough



Aviation

Buckland Airport Improvements

Resurface existing runway and taxiway, extend Runway 11/29 to 3,400 feet, expand the apron, apply a dust palliative, and upgrade airport lighting.

Plan Goals: Enhancement, Improvement

Deering Airport, Snow Fence and Access Road Improvements

Resurface the existing runway, taxiway, and apron, and provide drainage improvements. Upgrade the airport lighting system and electrical building. Provide erosion protection for Runway 29's runway safety area. Upgrade and armor the airport access road to reduce flooding and provide cross drainage.

Plan Goals: Enhancement, Improvement

Kivalina Airport Relocation

Relocate the Kivalina airport away from the coast and the threat of erosion and storm surges. Kivalina has developed an evacuation road and new inland school as part of a broader effort to relocate the entire community. The relocation effort can build off the work completed for the evacuation road (e.g., material source investigations, environmental data collection) to identify potential locations, costs, and impacts.

Plan Goals: Accessibility, Adaptation, Connectivity, Improvement

Kobuk Airport Technology Improvements

Kobuk Airport needs several upgrades to improve safety and maintain service in inclement weather. This includes an Automated Weather Observing Station (AWOS), a Remote Communication Outlet (RCO), and a weather camera. Currently, the airport has an RNAV approach that cannot be used without an AWOS. Likewise, the absence of an RCO and weather camera limit some commercial operations at the airport.

Plan Goals: Accessibility, Adaptation, Connectivity, Improvement

Kotzebue Crosswind Runway Resurfacing

Resurface crosswind runway.

Plan Goals: Enhancement, Improvement

Noatak Airport Relocation

Relocate the existing airport and access road, acquire land for the new airport, and close the existing airport, which is subject to riverine erosion.

Plan Goals: Enhancement, Improvement

Noorvik Airport Rehabilitation

Rehabilitate airfield surfaces.

Plan Goals: Enhancement, Improvement

Roads/Highways

Ambler-Shungnak-Kobuk Road Connection

A road connecting these three communities could improve social connections and reduce the cost of living. This road would allow goods to be barged into Ambler and then transported by road to Shungnak. This road would also support additional mineral exploration activity (see page 58 for more information).

Plan Goals: Accessibility, Adaptation, Connectivity, Economic Development, Improvement

Kiana-Noorvik-Selawik Road Connection

This road would connect Selawik to a material source. It would also provide a connection to the spud farm facility. See page 59 for additional information.

Plan Goals: Accessibility, Adaptation, Connectivity, Economic Development, Improvement

Kotzebue Cape Blossom Road Phase 2: Sadie Creek to Cape Blossom

Complete the next phase of the connection between Kotzebue and the future port and barge landing facilities at Cape Blossom. The multi-modal facilities will provide more efficient delivery of cargo and fuel, reducing the need to transfer goods to shallow draft lightering vessels.

Plan Goals: Adaptation, Economic Development, Improvement

Noatak to Delong Mountain Transportation System (DMTS)

Develop a connection between Noatak and the DMTS. This connection will allow freight to be trucked to Noatak from the DMTS port rather than flown in, as well as provide an alternative way for all Red Dog employees to access the site.

Plan Goals: Accessibility, Adaptation, Connectivity, Economic Development, Improvement

See page 45 for definition of plan goals.

Point Hope Evacuation Road

Locate, design and construct an evacuation road to serve Point Hope. More frequent storm surges, flooding, and erosion threaten the community and the airport. An evacuation road provides residents an emergency route to safer ground during these events.

Plan Goals: Adaptation, Economic Development, Improvement

Selawik Barge Landing Access Road and Boardwalk Improvements

Rehabilitate Selawik's road to its barge landing and construct a new barge landing staging area. Lighting will be installed, and sections of the existing boardwalk will be replaced. The project will also rehabilitate the utility crossing at the landfill.

Plan Goals: Adaptation, Economic Development, Improvement

Selawik Evacuation Road

Plan, design, and construct an evacuation road from Selawik to higher ground away from the Selawik River. Flooding periodically threatens the village and residents have no place to go during a flood. The community's airport is also threatened by flooding, thereby precluding evacuation via air. Funding for this road is included in the FY22 budget.

Plan Goals: Improvement

Marine/Riverine

Cape Blossom Port/Harbor

Currently, barges serving Kotzebue must lighter goods to shore, thereby increasing the cost of barge shipments significantly. A marine facility at Cape Blossom would eliminate the need for lightering and reduce the cost of shipping.

The USACE and the City of Kotzebue are assessing the feasibility of the deep-water dock, while the DOT&PF is designing and constructing a road extension to Cape Blossom.

Plan Goals: Adaptation, Economic Development, Improvement

Winter Trails

Winter Trail Marking

Mark winter trails between the following communities:

Kotzebue, Noatak, Buckland, Deering, Selawik, Noorvik, Kiana, Ambler, Shungnak, Kobuk (967 miles)

Plan Goals: Connectivity, Enhancement

See page 45 for definition of plan goals.



Kotzebue Cape Blossom Road

Norton Sound/Seward Peninsula



Aviation

Basch Creek Airport Improvements

Resurface the airfield and install lighting system so that basin creek can function as a GA reliever airport during weather events at Nome City Field.

Plan Goals: Enhancement, Improvement

Brevig Mission Airport Lighting & Resurfacing

Resurface the airfield and improve airport lighting.

Plan Goals: Enhancement, Improvement

Little Diomed Helipad Improvements

Place new crushed aggregate surface course, lighting upgrades and electrical components.

Plan Goals: Enhancement, Improvement

Koyuk Airport Improvements

Extend the runway to 3,300 feet long and 75 feet wide and improve the surfacing of the runway. The runway is the shortest in the area, and the surface is soft in spring; both factors affect air taxi reliability. The need for new surfacing was also identified in the most recent airport inspection.

Plan Goals: Accessibility, Connectivity, Enhancement, Improvement

Nome Airport General Aviation Runway Construction

Construct a general aviation runway at Nome Airport to accommodate the closure/relocation of Nome City Field.

Plan Goals: Adaptation, Enhancement, Improvement

Nome Airport Paving

Repave the airfield.

Plan Goals: Enhancement, Improvement

Nome City Field Relocation

Airspace conflicts exist between Nome City Field and Nome Airport. Relocating Nome City Field will eliminate these conflicts and provide develop-able land for the City of Nome.

Plan Goals: Adaptation, Economic Development, Enhancement

Shaktoolik Airport Lighting & Resurfacing

Resurface the airfield and improve airport lighting.

Plan Goals: Enhancement, Improvement

Shishmaref Airport Erosion Control

Install erosion control protection (Rock Revetment) on the ocean and lagoon side of Sarichef island adjacent to the airport.

Plan Goals: Enhancement, Improvement

Stebbins Airport Improvements

Extend the runway to 3,300 feet long and 75 feet wide; raise the runway above surrounding terrain; improve the Snow Removal Equipment Building; install a weather camera; update the ALP. Stebbins Airport does not meet minimum standards for a community airport and was identified for improvements by the Alaska Aviation System Plan.

Plan Goals: Adaptation, Enhancement, Improvement

Unalakleet Crosswind Runway Rehab

Unalakleet needs rehabilitation of its crosswind runway to repair failed pavement.

Plan Goals: Adaptation, Enhancement, Improvement

Wales SREB

Build a Snow Removal Equipment Building (SREB).

Plan Goals: Enhancement, Improvement

Roads/Highways

Elim-Golovin-White Mountain-Council Road Connection

This connection would improve access between these communities, potentially reduce the cost of living and provide greater access to employment opportunities. This connection would also improve access to the Bluff mine prospect and support additional mineral exploration activity (see page 57 for more information).

Plan Goals: Accessibility, Adaptation, Connectivity, Economic Development, Improvement

Gambell to Savoonga Road Connection

Stakeholders from Gambell and Savoonga have indicated there is interest in developing a road connection between these two St. Lawrence Island communities. A connection would create redundancy by addressing emergency evacuation, access to airports in the case one is closed due to

fog or weather, potential for shared marine infrastructure, and social interactions. The level of interest and appropriate project sponsor need to be determined.

Plan Goals: Adaptation, Connectivity

Nome-Council Road 16-32 Rehabilitation

This project will rehabilitate the Nome Council road located on the Safety Slough Spit to surfacing, drainage improvements and shoreline protection as needed.

Plan Goals: Enhancement, Improvement

Nome Dexter Bypass Rehabilitation

This existing 5-mile seasonal gravel road connects the Teller Highway to the Taylor Highway/Kougarok Road. This project would include surface rehabilitation, drainage improvements and resiliency improvements.

Plan Goals: Enhancement, Improvement

See page 45 for definition of plan goals.

Nome Greg Kruschek Avenue Rehabilitation

This project will rehabilitate Greg Kruschek Avenue including surface rehabilitation, drainage, pedestrian improvements to facilitate access to medical and other public facilities located along this road.

Plan Goals: Accessibility, Adaptation, Enhancement, Improvement

Nome Teller Highway from Greg Kruschek Avenue to Center Creek Road Rehabilitation

This project will rehabilitate, resurface, make drainage improvements, and improve resiliency of approximately 3.75 miles of the Teller Highway between Greg Kruschek Avenue and Center Road.

Plan Goals: Enhancement, Improvement

Teller Highway-Snake River Bridge Replacement

The Snake River Bridge (Constructed circa 1959) should be monitored and replaced to improve the safety of the traveling public.

Plan Goals: Accessibility, Connectivity, Enhancement, Improvement

Shishmaref Evacuation Road

Evaluate the design/construction of an evacuation road from Shishmaref to the nearby mainland. Shishmaref is being threatened by storm surges and coastal erosion. DOT&PF is currently studying potential routes for an evacuation road, as well as a “protect in place” strategy. This project would implement the study’s recommendations.

Plan Goals: Adaptation, Improvement

Teller Highway-Sinuk River Bridge Repair

The Sinuk River Bridge (constructed circa 1967) should be monitored and repaired to improve the safety of the traveling public.

Plan Goals: Accessibility, Connectivity, Enhancement, Improvement

Marine/Riverine

Elim Navigation Improvements

Develop a small boat harbor to support commercial and subsistence fishing activities. Build on the findings of the USACE feasibility study to initiate the formal NEPA process for design and construction.

Plan Goals: Adaptation, Improvement

Little Diomedé Navigation Improvements

Design and construct a small boat harbor at Little Diomedé to improve vessel safety. The community is especially susceptible to strong storms that damage boats. Marginally rough seas also prevent the launch and landing of small boats. This has delayed the arrival of people and goods, as well as limiting the ability of residents to conduct subsistence hunting and fishing. The USACE and the community are engaged in developing this project.

Plan Goals: Adaptation, Improvement

See page 45 for definition of plan goals.



Unloading mail at Koyukuk airport ramp

Becky Cronkhite

Potential Road Connections

There are four potential new road connection routes recommended for further analysis, potentially via Planning and Environmental Linkages (PEL) studies:

- Elim to Golovin to White Mountain to Council Road
- Ambler to Shungnak to Kobuk
- Kiana to Noorvik to Selawik
- Nulato to Koyukuk to Galena

For each proposed study, further work is needed in communication and coordination with potentially affected communities and stakeholders. A typical PEL process includes coordination with resource and regulatory agencies, regional planning agencies, tribal governments, interest groups, and the greater community to coordinate information exchange, collaborate during decision making, and lay the ground work for agreements regarding operating procedures, funding, programmatic approaches, and dispute resolution procedures.

PEL Study Process

A PEL study process is typically used to identify issues and environmental concerns in a corridor or a specific location. They are often developed in consultation with resource and regulatory agencies to improve the decision-making process. A PEL study process may include the development of a proposed project purpose and need, concept design, preliminary screening of alternatives, and a preliminary identification of environmental impacts and mitigation opportunities that could be carried forward to expedite a project's NEPA documentation and project design processes. The ability to carry forward these elements may reduce a project's overall project development timeframe.



Musk oxen near Council

SmileLikeUMeanit iStock

Elim-Golovin-White Mountain-Council Road

The Western Alaska Access Planning Study (2010) evaluated routes to connect the Nome-Council Road to the contiguous state highway system near Fairbanks. This road would improve access between villages in the Yukon River area and Fairbanks, potentially reducing the cost of living in these villages and providing greater access to employment opportunities. The study recommended a Yukon River Road Corridor to be completed in seven stages. The first stage, Manley to Tanana, was constructed in 2016. The second recommended connection is Elim to the Nome Council Highway via White Mountain and Golovin. This connection would also improve access to the Bluff mine prospect, a known significant mineral occurrence, and could support additional exploration activity in the region and provide access to a potential deep-water port at Cape Darby, as well as areas used for hunting and subsistence.

Populations Affected (2019)

Elim 359

Golovin 172

White Mountain 212

Nome 3,691



Ambler-Shungnak-Kobuk

A road connecting these three communities would improve social connections and potentially reduce the cost of living. Fuel is often flown into Shungnak because the water level in the Kobuk River is too low to support barge access. A road would facilitate the movement of fuel and other freight from Ambler to Shungnak and Kobuk during periods of low water.

The Shungnak Comprehensive Plan identifies the completion of a road between Shungnak and Kobuk as one of its top priorities. Additional benefits of this road include improved access to the community landfill and improved access to the Bornite Road, which would allow additional mineral exploration activity.

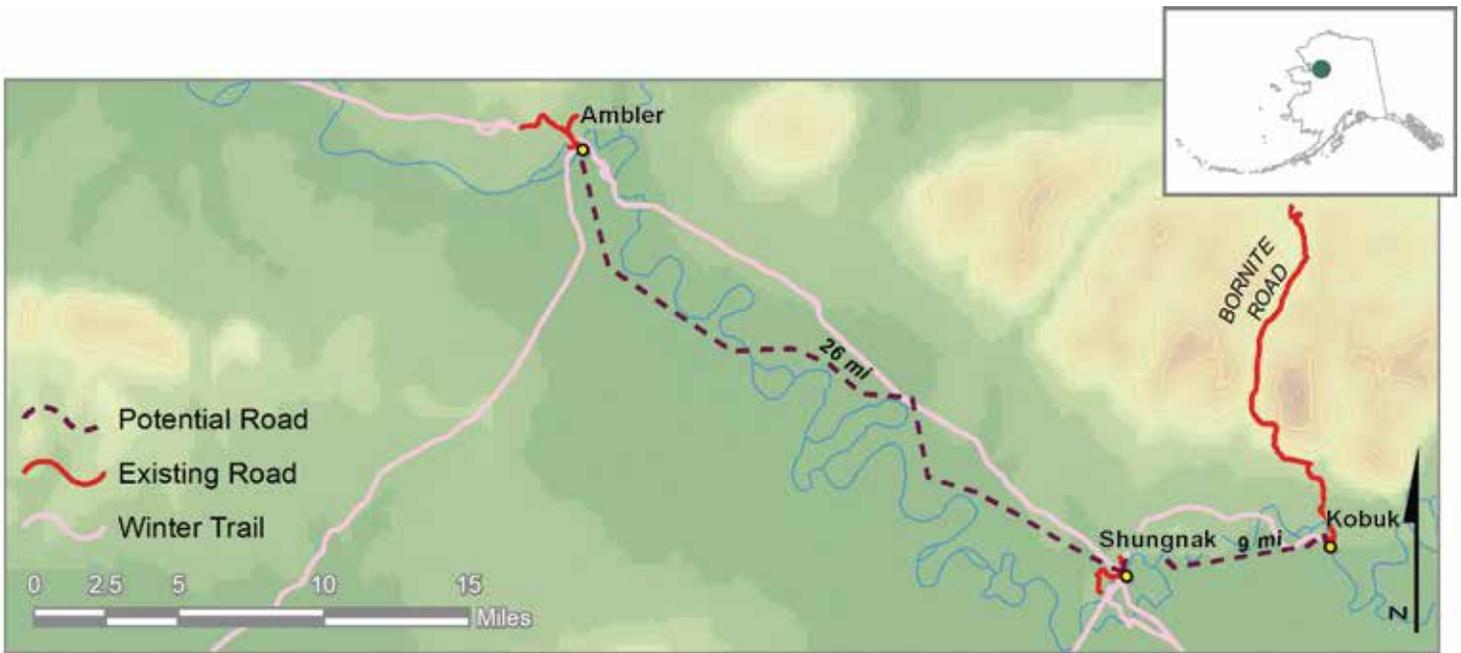
If the private Ambler Mining District road is developed, these communities could potentially connect to the National Highway System on a permit basis.

Populations Affected (2019)

Ambler 284

Kobuk 145

Shungnak 291



Kiana–Noorvik–Selawik

The Selawik Comprehensive Plan identifies a permanent road connection that links Selawik, Noorvik, and Kiana to Kotzebue. The 2013 Selawik Long Range Transportation Plan indicates that a Selawik-Noorvik-Kiana road would connect Selawik to the material site at Spud Farm. It would also provide residents a connection to the Maniilaq Association correctional facility near Spud Farm, a potential source of employment for Selawik residents. The 2016 Northwest Alaska Energy Plan recommends an electrical intertie that co-locates roads and power lines between Kiana, Noorvik, and Selawik to help stabilize energy costs in the area. Rights-of-way will need to be thoroughly researched and negotiated, as the road would likely pass through federal (BLM, National Park Service) and NANA Regional Corporation lands. If funding allows, the study should consider an eventual connection to Kotzebue.

Populations Affected (2019)

Kiana 417

Noorvik 669

Selawik 861



Nulato-Koyukuk-Galena

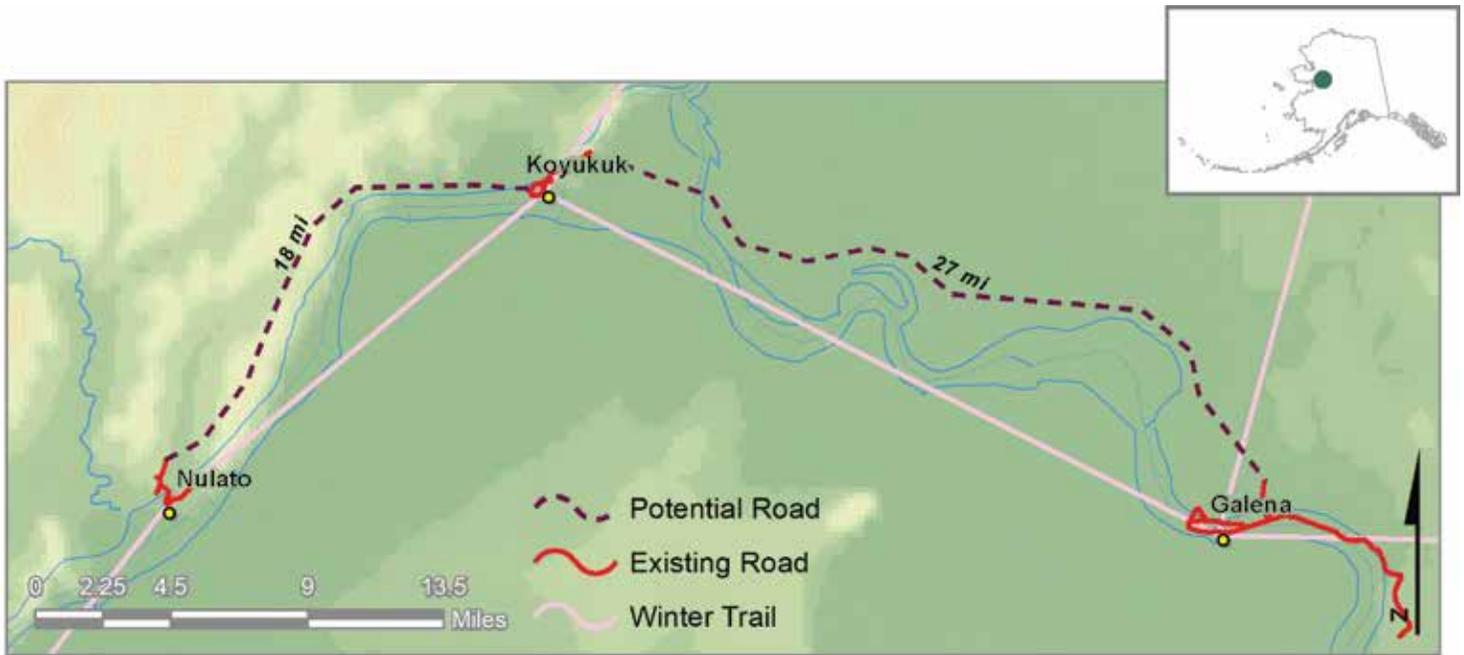
The Western Alaska Access Planning Study proposes a connection between Galena and Nulato which would also include a connection to Koyukuk. Galena is a regional hub for communities in the Yukon-Koyukuk region. It provides services and employment opportunities to Galena residents as well as surrounding communities like Nulato and Koyukuk. If constructed, this road would improve educational opportunities in the area by providing Nulato and Koyukuk residents with better access to the Galena Interior Learning Academy, a boarding high school and vocational school. It would also improve social connections by allowing residents to visit more regularly. There is also potential for Galena to be used as a bulk fuel and warehousing facility, potentially reducing the cost of living in the region.

Populations Affected (2019)

Nulato 239

Koyukuk 95

Galena 472



Conclusion

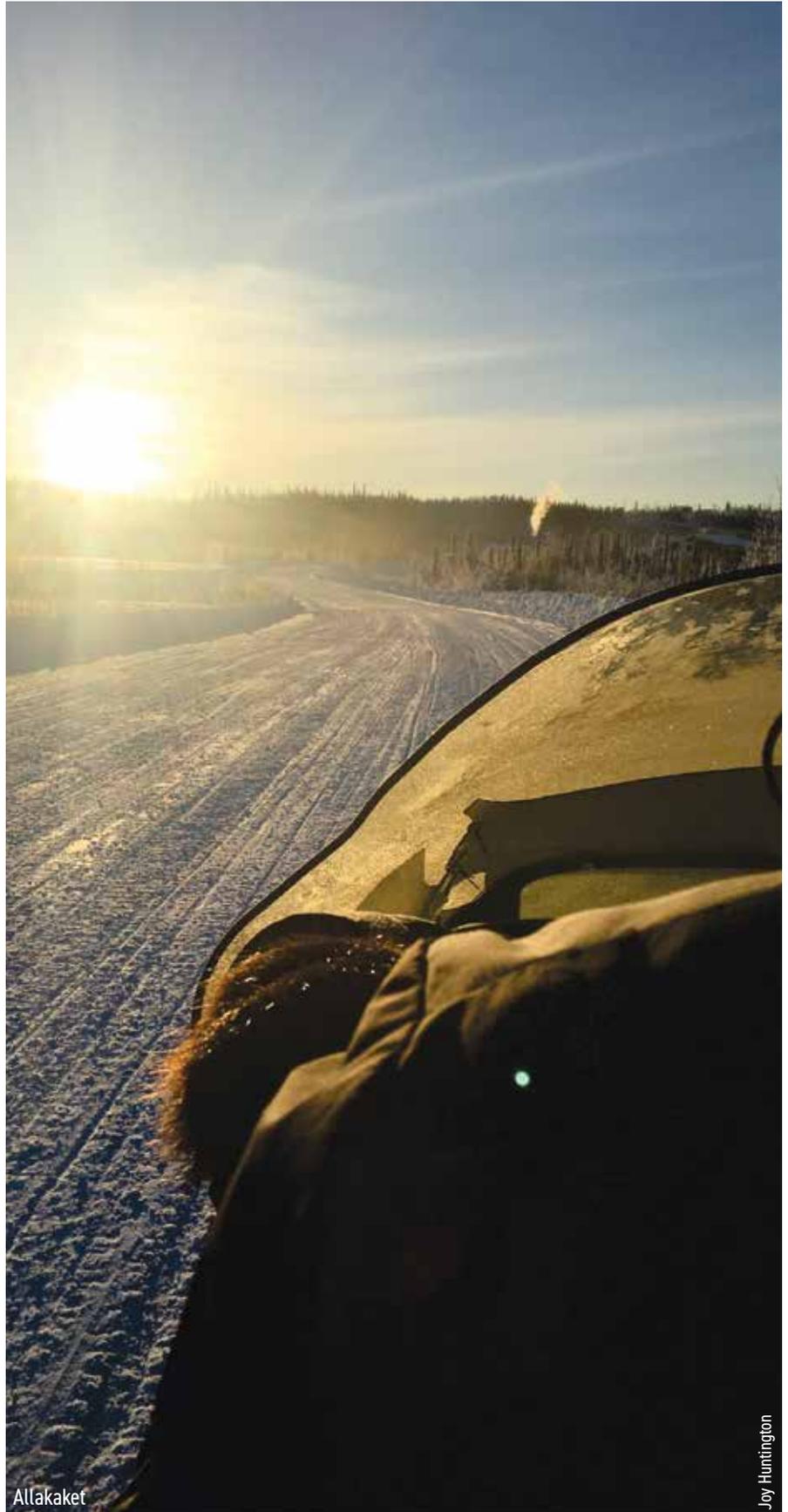
The large part of Alaska covered by this plan is incredibly dynamic. Changes are occurring at a pace that requires creative partnerships, infrastructure investment, and collective planning for the future. From climate change impacts such as melting permafrost and eroding coastlines to pandemic-induced changes in telework, healthcare, and transportation, the region's residents and communities face many challenges.

The Northwest Alaska Transportation Plan (NWATP) provides a framework of recommendations and resources to guide infrastructure investments and facilitate partnerships that will help build resiliency in the transportation system. Communities, agencies, and Tribes can use the plan to identify opportunities to collaborate across jurisdictions and leverage all available resources to implement the plan's goals. Continued collaboration is critical to successful implementation of the plan.

Over the course of the lifecycle of this document, funding sources, agency priorities, and regulations will likely change. However, the concepts and recommendations presented in the plan will remain relevant and important. To ensure this is the case, residents and stakeholders should continually review their community's priorities and use the NWATP to help identify partnerships and resource sharing.

A guiding theme of the plan is resiliency – resiliency in infrastructure; resiliency in transportation systems; and resiliency in the area's residents and communities. As recommendations in the plan are implemented with sound engineering principles that incorporate resiliency measures, the region will become more resilient in light of climate change, and fortified against potential disruptions to the transportation network as well as inevitable changes in funding.

Throughout the development of the Northwest Alaska Transportation Plan, residents, business owners, tribal leaders, agency staff, and many others provided invaluable feedback, through numerous phone calls, emails, and virtual open houses, and public outreach events. We sincerely thank everyone who has dedicated valuable personal time to this effort. In turn, the Department looks forward to assisting the region in implementing the recommendations of the plan as opportunities emerge to constructively shape the region's critical transportation system.



Allakaket

Joy Huntington

Glossary

17(b) – Easements under ANSCA that permit public access to cross private lands to reach public lands and/or waterways

5339 Funds – FTA Formula Grants for Rural Areas

AASP – Alaska Aviation System Plan

ADS-B – Automatic Dependent Surveillance - Broadcast: ADS-B replaces FAA radar technology with satellites

AFN – Alaska Federation of Natives

AHS – Alaska Highway System

AIDEA – Alaska Industrial Development and Export Authority

AIP – Airport Improvement Program

AMDIAR – Ambler Mining District Industrial Access Road

AML – Alaska Municipal League

ANCSA – Alaska Native Claims Settlement Act

ANILCA – Alaska National Interest Lands Conservation Act

ANWR – Arctic National Wildlife Refuge

AOPA – Aircraft Owners and Pilots Association

ASOS – Automatic Surface Observation System per FAA

ASTAR – Arctic Strategic Transportation and Resources

AUTC – Alaska University Transportation Center

AWOS – Automated Weather Observing System

BIA – Bureau of Indian Affairs

BRIC – Building Resilient Infrastructures and Communities—a FEMA grant program

CDP – Census Designated Place

CETC – Center for Environmentally Threatened Communities

CIP – Capital Improvement Plan

CSU – Conservation System Unit

CTP – Community Transportation Program

CWAT – Community Winter Access Trails

DCRA – Alaska Department of Community and Regional Affairs

DMTS – Delong Mountain Transportation System

DNR – Alaska Department of Natural Resources

DOT&PF – Alaska Department of Transportation and Public Facilities



FAA – Federal Aviation Administration	NR – Northern Region
FAST Act – Fixing America's Surface Transportation Act	NSB – North Slope Borough
FFY – Federal Fiscal Year	NWAB – Northwest Arctic Borough
FHWA – Federal Highway Administration	NWATP – Northwest Alaska Transportation Plan
FLAP – Federal Lands Access Program	PAAD – Public Access Assertion and Defense - a unit under DNR that monitors 17(b) easements
FNSB – Fairbanks North Star Borough	PEL study – Planning and Environmental Linkages study or studies
FTA – Federal Transit Administration	PLO – Public Land Order implemented by the Secretary of the Interior
FY – Fiscal Year	PLO 5150 – 1971 Public Land Order reserving a transportation and utility corridor along the Trans-Alaska Pipeline route
GA – General Aviation	RCO – Remote Communication Outlet
GF – State General Fund	RPZ – Runway Protection Zone
GIS – Geographic Information System	RS2477 – Revised Statute of 1878 Trails on Federal Lands
GPS – Global Positioning System	RTAP – Rural Transportation Assistance Program
HSIP – Highway Safety Improvement Program	SAR – Search and Rescue
MLLW – Mean Lower Low Water	SREB – Snow Removal Equipment Building
MP – Milepost	STIP – Statewide Transportation Improvement Plan
MPO – Metropolitan Planning Organization	STP – Surface Transportation Program
NANA – NANA Regional Corporation Inc. A for-profit Alaska Native corporation, formed as a result of the Alaska Native Claims Settlement Act (ANCSA)	TAP – Transportation Alternatives Program
NAS – National Airspace System	TTP – Tribal Transportation Program
NEPA – National Environmental Policy Act	UAS – Unmanned Aerial System
NHFN – National Highway Freight Network	USACE – United States Army Corps of Engineers
NHFP – National Highway Freight Program	USPS – United States Postal Service
NHPP – National Highway Performance Program	VIP – Village Infrastructure Protection
NHS – National Highway System	YKCA – Yukon-Koyukuk Census Area
NOFO – Notice of Funding Opportunity	
NPIAS – National Plan of Integrated Airport Systems	



With funding from



U.S. Department of Transportation
**Federal Highway
Administration**

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With a grant from



The preparation of this document was supported in part with financial assistance through the Airport Improvement Program from the Federal Aviation Administration (AIP Grant Number 3-02-0000-023-2017) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.