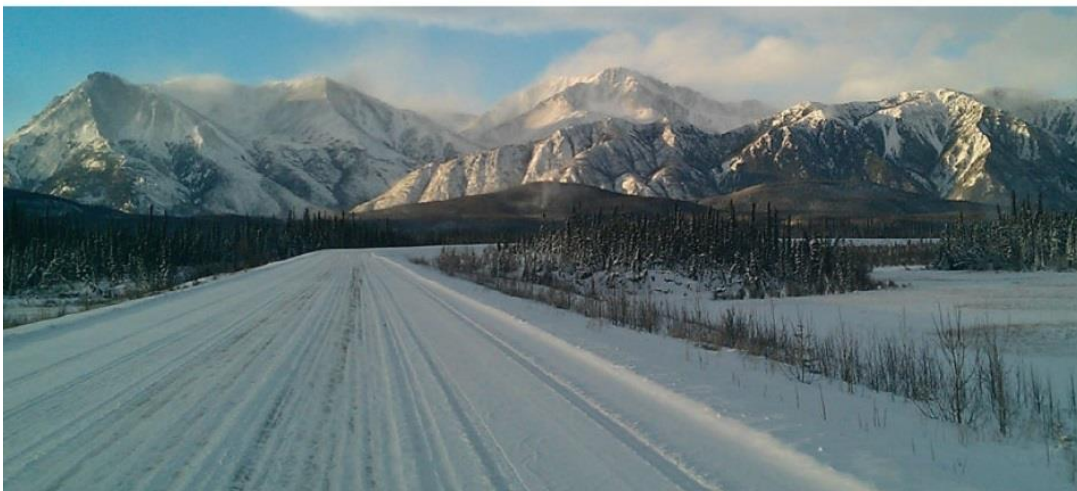




Alaska Statewide Long-Range Transportation Plan

# LET'S KEEP MOVING 2036: Trends and System Analysis

September 2016



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Plan  
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## INTRODUCTION AND ORGANIZATION

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*Let's Keep Moving 2036*, Alaska's Statewide Long-Range Transportation Plan (LRTP) establishes transportation policies, goals, and implementing actions for the Alaska Department of Transportation and Public Facilities (DOT&PF) through 2036. This comprehensive Plan provides a framework for prioritizing investments to achieve the DOT&PF's mission of delivering a safe and reliable transportation system.

This Plan is organized into three documents:

- **Policy Plan** introduces the State's transportation system and identifies the trends affecting travel demand and the provision of safe, reliable, and cost-effective transportation infrastructure that requires planning by the State. It includes the policies and actions that guide the long-range preservation and development of the Alaska transportation system.
- **This document, Trends and System Analysis** describes the extent and condition of the transportation system in more detail and the trends affecting its performance, and includes a detailed needs assessment and an overview of the financial situation.
- **Freight Plan Element** assesses freight transportation in Alaska and the risks to freight mobility through 2036.

### Guiding Principles

This document is intended to present detailed materials and analysis that support the development of the *Policy Plan*. The Plan was developed to meet both federal and state planning requirements for long-range transportation planning. Exhibit 1 presents the required federal and state mandates for long-range transportation planning.

**Exhibit 1: Federal and State Mandates for Long-Range Transportation Plan Development**

***Federal Mandate***

The long-range transportation plan, which is required by federal regulation (23 CFR 450.216), is one element of a federally required continuing, cooperative, and comprehensive statewide transportation planning process. The mandate is to provide a clear link between policy, planning, evaluation, and the investments that are made. The intent is for careful planning and sound evaluation to guide decision making. To do this, Alaska is required to prepare a statewide, twenty-year long-range plan that addresses all modes of transportation and takes into consideration eight planning factors that are to be addressed in all elements of the planning process:

1. Support the economic vitality of the United States, the States, nonmetropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency
2. Increase the safety of the transportation system for motorized and non-motorized users
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase the accessibility and mobility of people and freight
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns
6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight
7. Promote efficient system management and operations
8. Emphasize the preservation of the existing transportation system

***State Mandate***

This long-range transportation plan is required by federal regulation (23 CFR450.216) and draws its authority from Alaska Statute (AS 44.42.050.). This Statute directs the Commissioner of DOT&PF to develop a comprehensive, intermodal, long-range transportation plan for the State. Intermodal planning considers all modes of transportation and the connections between the modes.



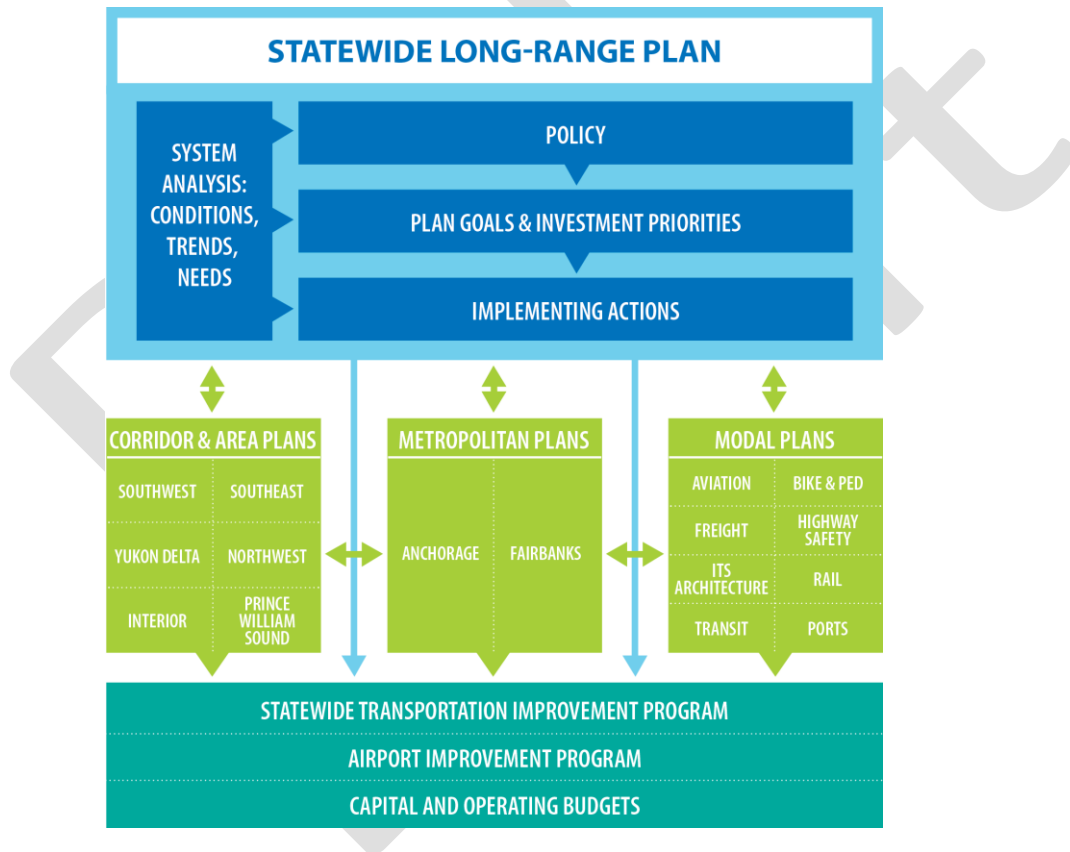
The purpose of the plan, including what the Plan is intended to accomplish, is presented in Exhibit 2.

Exhibit 2: What this Plan Accomplishes

| This Plan will   | This Plan will not   |
|--|--|
| <ul style="list-style-type: none"> <li>Align with new Federal mandates</li> <li>Align with the State's policy direction</li> <li>Be system level and address all modes</li> <li>Address DOT&amp;PF responsibilities as the owner</li> <li>Identify priorities</li> <li>Identify performance measures</li> <li>Meet state and federal requirements</li> </ul> | <ul style="list-style-type: none"> <li>List projects</li> <li>Be unrealistic</li> <li>Be too general</li> <li>Identify specific costs</li> <li>Identify local transportation priorities</li> </ul> |

Exhibit 3 illustrates the statewide planning process, which produces the Long-Range Transportation Plan, area plans, modal plans, lower-tier plans and the Statewide Transportation Improvement Program.

Exhibit 3: Statewide Planning Process



## FAST Requirements

This Plan was initially developed to meet MAP-21 long-range transportation planning requirements and then updated to be consistent with the requirements of the Fixing America's Surface Transportation Act (FAST) enacted in December 2015. Exhibit 4 presents the Federal planning requirements that have been updated to reflect the FAST requirements.

Exhibit 5 presents the planning implications of FAST compared to MAP-21. As stated previously, these requirements remain mostly the same as MAP-21 with some language changes.

**Exhibit 4: FAST Long-Range Transportation Plan Requirements**

| FAST LRTP Requirement   | <i>Let's Keep Moving 2036</i>   |
|---|---|
| 1. The Plan shall cover a minimum 20-year forecast period for all areas of the State that provides for the development and implementation of the intermodal transportation system of the State.   | This Plan is an update of Let's Keep Moving 2030 and covers a 20-year planning horizon from 2016 to 2036.   |
| 2. The Plan shall be developed in cooperation with metropolitan planning organizations, affected nonmetropolitan officials with responsibility for transportation, tribal government, and as appropriate, in consultation with state, tribal, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.   | This Plan has been developed in consultation with a wide range of stakeholders, in addition to the STIP, regional, modal, and MPO plans.  |
| 3. The Plan shall include participation by interested parties, including nonmetropolitan local elected officials, citizens, affected public agencies, representatives of public transportation employees, public ports, freight shippers, private providers of transportation (including intercity bus operators, employer-based commuting programs, such as a carpool program, vanpool program, transit benefit program, parking cash-out program, shuttle program, or telework program), representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, providers of freight transportation services, and other interested parties through the opportunity to comment on the proposed plan, public meetings, and making public information available in electronically accessible format and means, such as the World Wide Web. | A combination of online public meetings and public open houses were used in developing this Plan. A log of all public comments received was maintained pursuant to 17 AAC 05.135 and other applicable laws and regulations. |

| FAST LRTP Requirement  | <i>Let's Keep Moving 2036</i>  |
|--|--|
| 4. The Plan shall include a discussion of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the Plan.   | Environmental mitigation activities are included as part of the Plan policies.   |
| 5. The Plan may include a financial plan that demonstrates how the adopted statewide transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the Plan, and recommends any additional financing strategies for needed projects and programs.   | The LRTP is a policy plan. It includes a financial analysis component that identifies available funding. Plan goals and implementing actions address the financial capacity of Alaska to implement the Plan. |
| 6. The Plan shall include a description of the performance measures and performance targets used in assessing the performance of the transportation system.  | Initial performance targets and the approach to performance measurement are included as part of the Policies and Action section in <i>Volume I</i> .   |
| 7. The Plan shall include a system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the established performance targets.  | The Plan presents a comprehensive baseline system assessment that addresses FAST's performance metrics, and a baseline needs assessment for lifecycle management needs through 2036.                         |
| 8. The Plan should include capital, operations, and management strategies, investment, procedures, and other measures to ensure the preservation and most efficient use of the existing transportation system, including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner and strategies and investments that preserve and enhance intercity bus systems, including systems that are privately owned and operated before the period end. | The Plan recognizes the need to balance the competing needs between developing and preserving the system. System preservation is addressed in the Policy and Actions section of <i>Volume I</i> .            |
| 9. Each State that receives funding under section 167 or title 23 shall develop a freight plan that provides a comprehensive plan for the immediate and long-range planning activities and investments of the State with respect to freight.   | The freight element is included in <i>Volume III</i> of this Long-Range Transportation Plan.   |
| 10. The Plan shall be published or otherwise made available including (to the maximum extent practicable) in electronically accessible formats and means, such as the World Wide Web.  | The Plan is available online at DOT&PF's website.  |

Exhibit 5: Implications of FAST

| Implications of FAST   |  |
|--|--|
| <i>There are no significant changes to the performance-based planning process in MAP-21.</i>   |  |
| <ul style="list-style-type: none"> <li>FAST expands the scope of the planning process to include addressing resiliency and reliability as well as enhancing travel and tourism of the transportation system: <i>Let's Keep Moving 2036</i> addresses these – special attention of risks due to lack of redundancy in the system.</li> </ul>  |  |
| <ul style="list-style-type: none"> <li>Adds language that the long-range transportation plan shall consider public ports and freight shippers. <i>Let's Keep Moving 2036</i> addresses these in policy, system analysis, and through the freight element.</li> </ul>   |  |
| <ul style="list-style-type: none"> <li>Changes “should” to “shall” regarding the inclusion of description of performance measures and the system performance report in a State’s long-range transportation plan. <i>Let's Keep Moving 2036</i> includes a description of performance measures and system performance using final performance rules where available, and the Notice of Proposed Rulemaking (NPRM) where the rules are still proposed and subject to modifications.</li> </ul> |  |

Exhibit 6 and Exhibit 7 present the freight planning requirements of FAST and the freight planning implications of FAST compared to MAP-21.

Exhibit 6: FAST Freight Planning Requirements

| FAST LRTP Requirement  | <i>Let's Keep Moving 2036</i>   |
|--|---|
| 1. The Plan shall include an identification of significant freight system trends, needs, and issues with respect to the State.   | This information is included in various sections of the Freight Element, including: Section 2 (Freight Demand Drivers); Section 3 (Freight System Elements); Section 4 (Critical Freight Trends); and Section 5 (Performance, Needs, and Opportunities).  |
| 2. The Plan shall include a description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the State.  | Section 6 of this Freight Element (Freight Goals, Policies, and Actions) provides a description of policies and strategies related to freight. Section 7 of this Freight Element (Freight Performance Measurement, Prioritization, and Project Evaluation) provides a comprehensive framework for performance based freight planning and investment.                                      |
| 3. The Plan shall include a listing, when applicable, of: (a) multimodal critical rural freight facilities and corridors designated within the State under section 70103 of this title and (b) critical rural and urban freight corridors designated within the State under section 167 of title 23. | The Freight Element identifies an Alaska Multimodal Freight Network (AMFN) which includes all major freight facilities that play a significant role in the state’s economy. Portions of the AMFN corresponding to federal designations defined under FAST are identified and may be periodically updated under separately adopted <i>Alaska Freight Element Implementation Guidance</i> . |
| 4. The Plan shall include a description of how the plan will improve the ability of the State to meet the national multimodal freight policy goals described in section 70101(b) of this title and the national highway freight program goals described in section 167 of title 23.                  | Section 8 of the Freight Element (Relationship with Other Plans and Federal Guidance) describes how the Freight Element supports national multimodal freight policy and national highway freight program goals.   |

| FAST LRTP Requirement   | <i>Let's Keep Moving 2036</i>  |
|---|--|
| 5. The Plan shall include a description of how innovative technologies and operational strategies, including freight intelligent transportation systems, that improve the safety and efficiency of freight movement, were considered.   | The use of innovative technologies and operational strategies, including ITS, is recommended in the Freight Element, as described in Section 6 (Freight Goals, Policies, and Actions).   |
| 6. In the case of roadways on which travel by heavy vehicles (including mining, agricultural, energy cargo or equipment, and timber vehicles) is projected to substantially deteriorate the condition of the roadways, the Plan shall include a description of improvements that may be required to reduce or impede the deterioration. | Section 5 of the Freight Element (Performance, Needs, and Opportunities) addresses infrastructure needs and planned improvements associated with natural resource (mineral, oil and gas extraction, timber, etc.) development, including existing roadways as well as potential future roadways. Freight priority projects consistent with this Freight Element, and investment plans to implement them, are identified and may be periodically updated under separately adopted <i>Alaska Freight Element Implementation Guidance</i> . |
| 7. The Plan shall include an inventory of facilities with freight mobility issues, such as bottlenecks, within the State, and for those facilities that are State owned or operated, a description of the strategies the State is employing to address the freight mobility issues.   | Section 5 of the Freight Element (Performance, Needs, and Opportunities) addresses freight facility performance and provides an inventory of planned actions and initiatives to improve the performance of state-owned facilities.   |
| 8. The Plan shall consider any significant congestion or delay caused by freight movements and any strategies to mitigate that congestion or delay.   | Section 5 of the Freight Element (Performance, Needs, and Opportunities) addresses freight congestion and delay. Policies and actions to improve freight performance are presented in Section 6 of the Freight Element (Freight Goals, Policies, and Actions).   |
| 9. The Plan shall include a freight investment plan that, subject to subsection (c)(2), includes a list of priority projects and describes how funds made available to carry out section 167 of title 23 would be invested and matched.   | The Freight Element is part of the LRTP, and the LRTP itself does not include projects or investments. Freight priority projects consistent with this Freight Element, and investment plans to implement them, are identified and may be periodically updated under separately adopted <i>Alaska Freight Element Implementation Guidance</i> .   |
| 10. The State Freight Advisory Committee shall be consulted in development of the Plan, if applicable.  | The Freight Element was developed with the participation of diverse public and private sector stakeholders, as part of the larger public involvement process guiding development of the full LRTP.   |

Exhibit 7: Implications of FAST on Freight Planning

| Implication of FAST on Freight Planning  |
|--|
| 1. Creates a National Multimodal Freight Network, which includes a National Highway Freight Network consisting of all Interstate Highways, an additional 41,000 primary freight network highway miles identified under MAP-21, and other State-identified highway segments.  |
| 2. Establishes a new National Highway Freight Program (NHFP) as part of the core Federal-aid Highway Program structure. This formula program is authorized at \$6.2 billion over five years, and each State's share of the NHFP will be based on the State's overall share of highway program apportionments. In addition, |



| Implication of FAST on Freight Planning |   |
|---|---|
|   | flexibility of NHFP dollars within a State will be related to its share of miles on the Primary Highway Freight System. The FAST Act repeals the increased Federal match for freight projects on interstates and highways.          |
| 3.                                      | Requires all States using formula dollars to complete a State Freight Plan, either standalone or part of a State's long-range transportation plan. The plans must be updated every five years.                                      |
| 4.                                      | Creates a Port Performance statistics program, requiring ports of certain thresholds to report annual throughput statistics. An advisory group will report to the Secretary annually on recommendations to improve port efficiency. |
| 5.                                      | Creates the Nationally Significant Freight and Highway Projects (NSFHP) discretionary grant program designed for major highway and freight projects funded at \$4.5 billion over five years.  |
| 6.                                      | Although funded out of the Highway Trust Fund (HTF), certain non-highway projects are eligible to receive portions of the NHFP and NSFHP dollars.   |

## Vision, Goals, Objectives, Performance Measures

The vision of the LRTP sets the direction for the transportation planning process by stating a broad but concise desired outcome, which leads to the development of more clearly defined goals and objectives. The vision of the *Let's Keep Moving 2036* Plan is to provide a transportation network that enables a growing economy and meets the mobility needs of Alaska's residents. The goals of Alaska's 2036 Long-Range Statewide Transportation Plan are to:

1. Manage the Alaska Transportation System using a performance based measurement approach for federally funded surface transportation assets based on federally required performance measures once the requirements for these measures are formalized through federal rule making), focusing on safety and the condition of pavements and bridges
2. Prioritize investments in system preservation, modernization, and new construction based on their impact on our transportation system performance goals
3. Proactively monitor trends and manage risks to transportation system performance
4. Monitor economic development activities and projects so that the resulting demands for transportation infrastructure investments can be addressed
5. Address increases in travel demand in urban areas through MPO, corridor and area plans
6. Improve transportation system resiliency and add redundancy to address safety and security risks
7. Manage and operate the system to improve operational efficiency and reduce safety risk
8. Incorporate livability, community, and environmental concerns in our decisions
9. Provide transparency for the allocation of scarce resources and accountability for the performance of the transportation system through performance measurement and reporting

As stipulated by MAP-21 (and consistent with FAST), LRTPs are required to include performance measures and targets, which are used to measure progress towards the accomplishment of Plan goals. These performance measures should be developed by the US DOT to help guide states, MPOs, and

transit agencies in the planning and programming of transportation projects. This guidance has been delayed—however, once USDOT sets measures in these areas, states will have 18 months to develop targets for each measure. The FAST Act focuses the federal-aid program on seven national goal areas: safety, infrastructure condition, congestion reduction, system reliability (and performance), freight movement and economic vitality, environmental sustainability, and reduced project delivery delays. Exhibit 8 outlines the performance metrics associated with each goal area.

Exhibit 8: Performance Metrics

| MAP-21 Goal Area                       | Performance Metrics  |
|--|--|
| Safety: Number of fatalities           | <b>Number of fatalities.</b> Five-year rolling average of the total number of fatalities on all public roads in a calendar year.   |
|  | <b>Fatality rate.</b> Five-year rolling average of the number of fatalities per 100 million (above) VMT for a calendar year.   |
|  | <b>Number of serious injuries.</b> Five-year rolling average of number of serious injuries on all public roads in a calendar year.   |
|  | <b>Serious Injury rate.</b> Five-year rolling average of number of serious injuries (above) per 100 million VMT for a calendar year.   |
| Infrastructure Condition               | <b>Number of non-motorized fatalities and serious injuries.</b> Five-year rolling average of the total number of fatalities and serious injuries among pedestrians and bicyclists in a calendar year.  |
|  | <b>NHS pavement in good, fair, or poor condition.</b> Condition of pavement is determined by a combination of IRI, cracking, and rutting.  |
|  | <b>NHS Bridges classified as good, fair, or poor condition.</b> Condition is determined by a combination of the NBI rating for deck, superstructure, and substructure.   |
| Congestion Reduction                   | <b>Structurally deficient NHS bridges.</b>   |
| System Reliability                     | <b>Annual hours of delay.</b> Annual hours of excessive delay per capita.  |
|  | <b>Level of Travel Time Reliability (LOTTR).</b> Percent of the Interstate System and non-Interstate NHS providing for reliable travel times.  |
| Freight Movement and Economic Vitality | <b>Peak Hour Travel Time Ratio (PHTTR).</b> Percent of the Interstate System and non-Interstate NHS where Peak Hour Travel Times meet expectations.  |
|  | <b>Truck Travel Time Reliability (TTTR).</b> Percent of the Interstate System Mileage providing for Reliable Truck Travel Times.   |
| Environmental Sustainability           | <b>Average Truck Speed.</b> Percent of the Interstate System Mileage Uncongested.  |
|  | <b>Criteria Pollutant Emissions.</b> Daily kilograms of on-road, mobile source air pollutants (carbon monoxide, volatile organic compounds, nitrogen oxide, and particulate matter) reduced by the latest annual Congestion Mitigation and Air Quality Improvement Program projects. |

## Document Organization and Purpose

This document describes the trends that impact the performance of the Alaska transportation system, the extent of the system, and the work required to maintain the current and future performance. This document is organized by the following sections:

- **Stakeholder and Public Outreach.** This section of the document details the stakeholder engagement and public outreach process taken by the Alaska DOT&PF in developing the LRTP.
- **Key Characteristics and Trends.** Analysis of key characteristics and trends that impact future transportation demand, delivery/supply, and performance to assess the opportunities and risks that these trends pose to achieving the Plan Vision. These trends helped to inform the development of policies and implementing actions to guide investments in and management of the transportation system. This section details Alaska's transportation trends in regards to demographics, visitation/seasonality, travel demand, freight, and safety.
- **Needs Analysis.** This section details the baseline state of Alaska's transportation system and examines anticipated future conditions in order to project transportation system investments.
- **Finance Overview.** This section of the document discusses the history of transportation funding in Alaska and impacts of the FAST act on future revenues of Alaska DOT&PF.

Plan  
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## STAKEHOLDER AND PUBLIC OUTREACH APPROACH

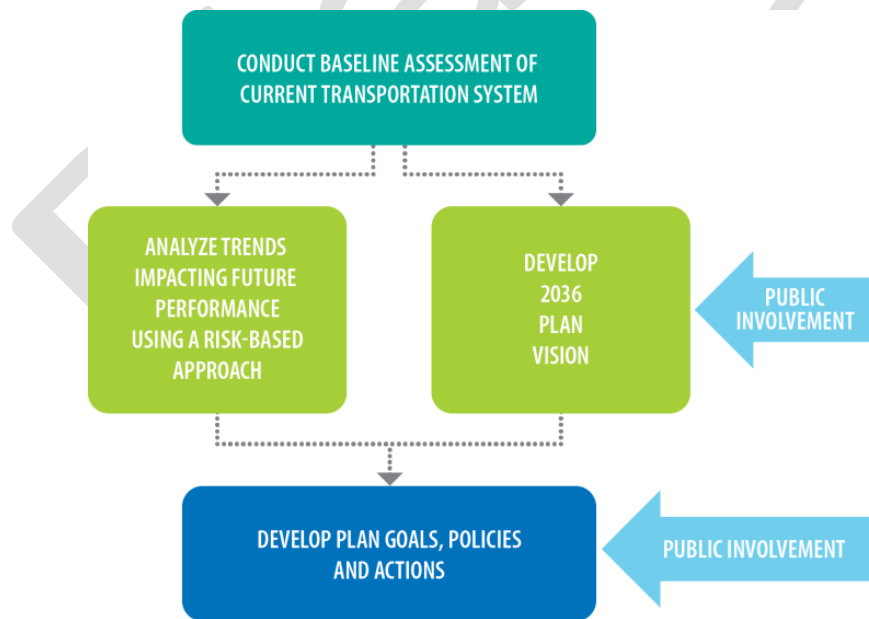
### Overall Approach

The public is the ultimate user of Alaska's transportation system: its roads, airports, ferries, transit, as well as walking and biking. Obtaining and soliciting meaningful input from the public and the state's public agency and private (business) stakeholders<sup>1</sup> and using this information to help create and meet the state's transportation vision, goals, and objectives is a key factor in a successful planning process. The DOT&PF developed and implemented a public involvement plan (PPP), based on the International Association for Public Participation's Public Involvement Spectrum, to provide a forum for participation throughout the project and during key phases of the planning process. Throughout the *Let's Keep Moving 2036* planning effort, the DOT&PF sought to include as many interested and affected individuals and organizations as possible to provide balanced and objective input and to help define the issues and opportunities facing the state into the future.

### Stakeholder and Public Involvement Process

DOT&PF's PPP included different levels of activities designed to reach different audiences at key stages of the plan's development (Exhibit 9).

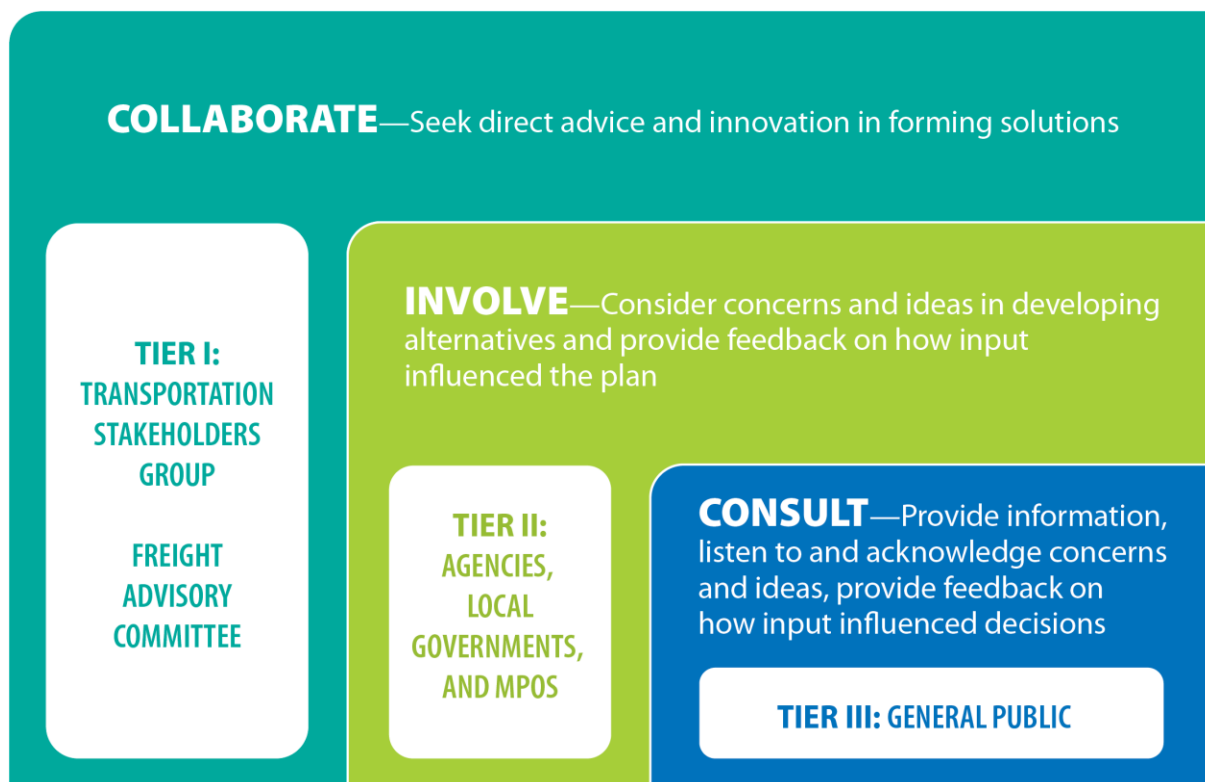
Exhibit 9: Public and Stakeholder Involvement in the Let's Keep Moving 2036 Plan



<sup>1</sup> Stakeholders and the public affected by the *Let's Keep Moving 2036* planning process include state residents and the general public, businesses, non-governmental community and economic development organizations, elected officials, Tribal governments, agencies and government entities, transportation and transit users, the media, and others.

Using a three-tier stakeholder engagement strategy, targeted outreach tools encouraged education and information sharing, as well as constructive dialogue and timely input in the LRTP's development (Exhibit 10).

Exhibit 10: Three-Tiered Outreach



Throughout the public involvement process, DOT&F's goals for stakeholder and public engagement were to:

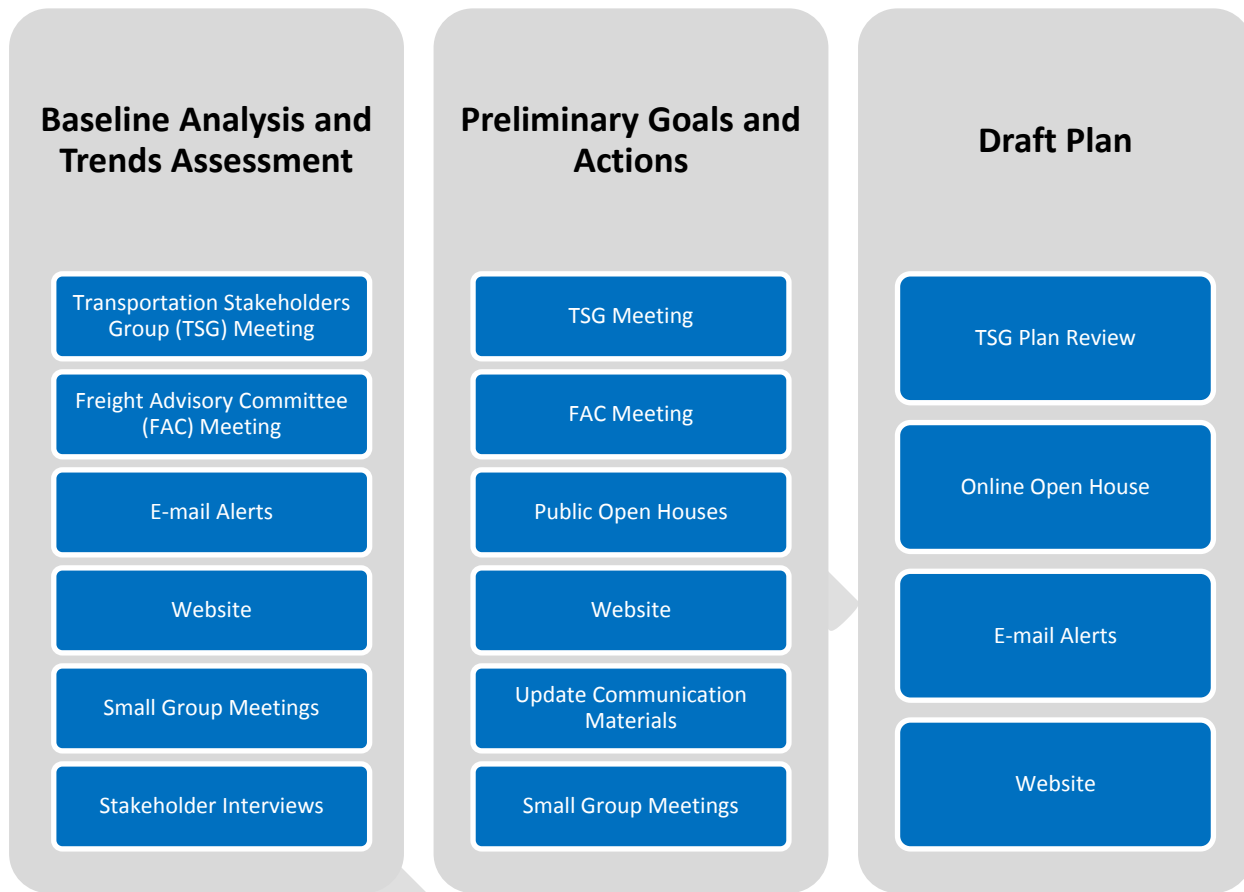
- **Inform** stakeholders and the public about the LRTP process and about statewide transportation infrastructure development and maintenance needs and issues
- **Involve** stakeholders and the public alike in helping to identify long-term direction about statewide transportation infrastructure needs and priorities
- **Consult** with the public and stakeholder organizations that have an interest in transportation and the LRTP to provide meaningful inputs and an authentic opportunity to participate in the planning process

### Structure

Based on the public involvement goals listed above, the DOT&PF used a variety of events, tools, and activities to solicit input from stakeholder groups at each stage of plan development. Exhibit 11 shows how each event, tool, and activity was used to support the planning process.



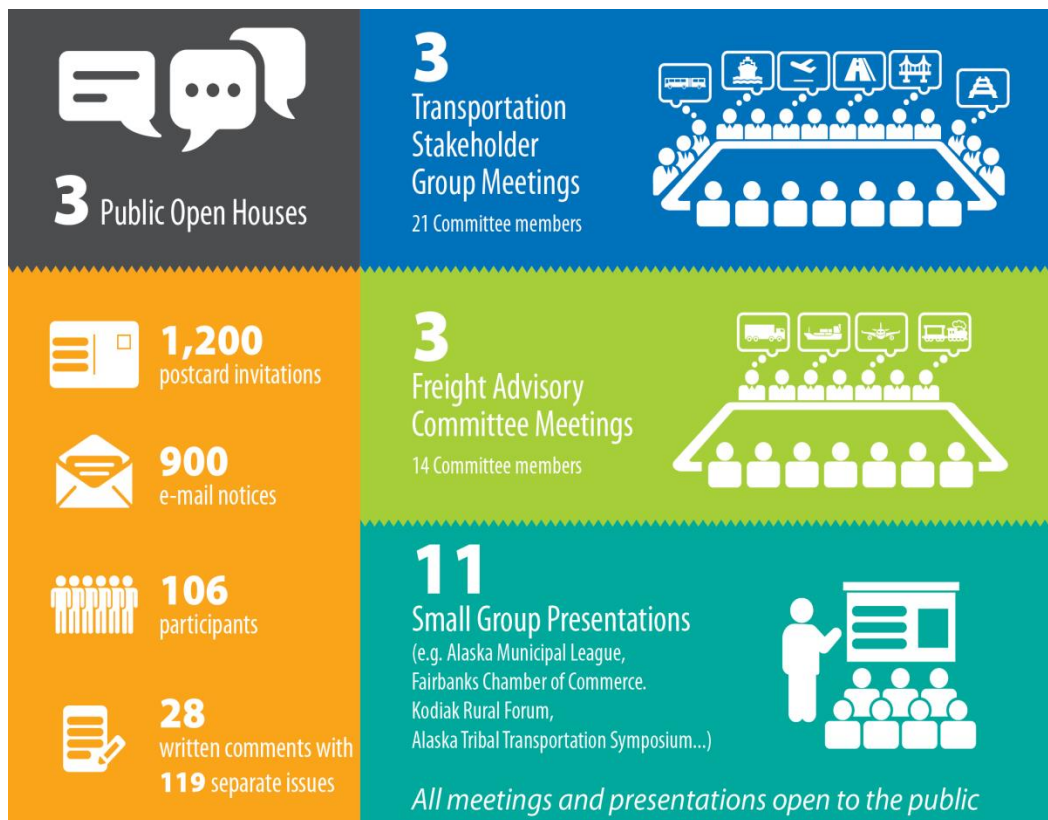
Exhibit 11: Planning Phases and Supporting Outreach Tools



### Engagement Tools and Techniques

Targeted outreach tools, including stakeholder and public outreach events shown in Exhibit 12, were developed and implemented to allow for education and information sharing with participants, and to engage in constructive dialogue and to ensure timely participant input at major phases of the plan's development. These events are described below.

Exhibit 12: Participation Events for Let's Keep Moving 2036 Plan



### Advisory Committees

The most engaged level of consultation occurred through participation in two advisory committees: the Transportation Stakeholders Group (TSG), which was comprised of various transportation modal users, interest groups, and agencies, and the Freight Advisory Committee, which was comprised of freight shippers and suppliers. These collaborative, interdisciplinary sounding boards provided the DOT&PF with feedback and recommendations on the plan's goals, recommended policies, and potential strategies.

#### Transportation Stakeholders Groups

The Transportation Stakeholders Group (TSG) served as a collaborative, interdisciplinary sounding board for the planning team. The TSG was charged with providing input on specific elements of the LRTP and advice on the plan generally, with emphasis on plan goals and objectives; baseline analysis, trends, and issues; and plan scenarios. Approximately 30 individuals, representative of a wide diversity of organizations, interests, regions, and modes of transportation, were invited to participate, including:

- Alaska Department of Commerce, Community and Economic Development, Division of Community and Regional Affairs
- Alaska Department of Natural Resources

- Alaska Energy Authority
- Alaska Industrial Development and Export Authority
- Alaska Mobility Coalition
- Alaska Municipal League
- Alaska Railroad Corporation
- Anchorage Metropolitan Area Transportation Solutions (AMATS)
- Aviation Advisory Commission
- City and Borough of Juneau
- City of Nome
- City of Unalaska
- DOT&PF Measurement Standards and Commercial Vehicle Enforcement
- Fairbanks Metropolitan Area Transportation System (FMATS)
- Federal Highway Administration, Western Federal Lands
- Marine Transportation Advisory Board
- Matanuska-Susitna Borough
- Municipality of Anchorage
- Rural Community Action Program (RuralCAP)
- State of Alaska, Office of the Governor
- University of Alaska Fairbanks

The TSG met three times: in March, May, and October 2014. The group was asked to consider various scenarios to plan for, with elements ranging from system preservation to travel demand, and finance; what policies they would recommend; and considerations of future risk for the plans policy areas. Risk areas included:

- Safety and cost
- Uncertainty
- Ramifications
- Capacity
- Culture
- Staffing Levels
- Reliability
- Public Opinion
- Benefit

By identifying the magnitude and probably of each risk area, the TSG provided recommendations on how the state could respond to potential transportation impacts.

#### Freight Advisory Committee

Similar to the TSG, the Freight Advisory Committee (FAC) was asked to focus on issues specific to freight transportation. The FAC is charged with providing input on specific elements of the LRTP related to the

transportation of commodities. Key issue areas for the FAC include freight trends and freight mobility needs; freight goals, strategies, and actions; and intermodal connectivity. The FAC was, in part, a subset of the TSG, and included representatives from the TSG and other entities. Organizations invited to participate included:

- Alaska Defense Logistics Agency Pacific
- Alaska Industrial Development and Export Authority
- Alaska Railroad Corporation
- Alaska Trucking Association
- Association of Village Council Presidents
- Crowley Marine Services
- DOT&PF, Office of the Commissioner
- DOT&PF, Measurement Standards and Commercial Vehicle Enforcement
- Everts Air Cargo/Alaska Air Carriers Association
- Fairbanks International Airport
- FedEx
- Port of Anchorage
- U.S. Army Alaska Command (2)
- U.S. Army Corps of Engineers

The FAC met three times, in conjunction with the TSG meetings: in March, May, and October 2014. During these meetings, the FAC was asked to provide input on the freight component's technical analysis, LRTP's goals related to freight, freight performance measures, and the potential for an Alaska Freight Network. The FAC recommended the following freight goals and strategies as part of this planning process:

- Invest in technologies that keep the State responsive to market needs
- Increase number of stranded markets reached
- Maintain State infrastructure for all modes including ensuring arterials are in good shape, identifying and maintaining freight routes to meet anticipated goods movement areas, keeping airports open, addressing maintenance deficiencies, creating a state transportation fund to better support underserved areas, and adjusting fuel tax for inflation
- Use Public-Private Partnerships to use infrastructure to leverage private development including identifying places where user fees can be used to maintain infrastructure (e.g. tolls) and increase the percentage of user contribution
- Plan for future needs during design
- Use geographic and intermodal connections to increase economic/ resource development including keeping freight routes open/accessible year-round
- Provide jobs for people
- Use intermodal connections to spur freight movement and job development by assessing and implementing bypass corridors for freight (around congested areas and reduce bottlenecks)

Input from the TSG and FAC were reflected in the materials, analysis, and recommendations presented in the LRTP. Documents and meeting notes from each of the TSG and FAC events were posted on the project website.

### *Public Open Houses and Online Open Houses*

In May 2014, the DOT&PF held a series of open houses to provide information about the update and to solicit information from the public about current and future transportation infrastructure needs and policies, and opinions about how the state should prioritize transportation system expenditures to balance needs statewide. The open houses were designed to encourage conversation on how the transportation system as a whole can best be planned for and managed to meet the state's current and future travel demands and infrastructure needs. Input was sought on the types of policies, performance measures, funding opportunities, and long-term transportation infrastructure goals of statewide importance that should be addressed in the plan. Meetings were held in:

- Fairbanks on May 7, 2014
- Mat-Su/Wasilla on May 8, 2014
- Anchorage on May 13, 2014

Each open house was held from 4:30 to 8:00 pm. The format for each event included a brief presentation about the LRTP, followed by a question and answer session starting at 5:30 pm each evening, and concluded with follow-up conversations related to various components of plan and posters on display.

In support of the open houses, post card invitations (Exhibit 13) were sent to more than 1,200 individuals and organizations from the project mailing list and more than 900 e-mail notices were also sent to potential participants. Event announcements were publicized in the "What's Up" listserv, state online public notices, and Anchorage Federation of Community Council's listserv. Print advertisements ran in the Fairbanks Daily News Miner on May 4 and 7, 2014, Mat-Su Valley Frontiersman on May 4 and 7, 2014, and Anchorage Daily News on May 9 and 13, 2014. In addition, an article about the plan update, "The State Seeks Input on Transportation Projects," appeared in the Frontiersman on May 6, 2014. In total, more than 100 people attended the public open houses.

Exhibit 13: Let's Keep Moving 2036 Open House Post Card

**Alaska Statewide Long Range Transportation Plan**

**LRTP**

**Public Open House Schedule**

|               |   |
|---------------|---|
| <b>May 7</b>  | Noel Wein Library<br>1215 Cowles Street<br>Fairbanks                        |
| <b>May 8</b>  | Curtis D. Menard Memorial Sports Center<br>1001 South Mack Drive<br>Wasilla |
| <b>May 13</b> | Loussac Library<br>3600 Denali Street<br>Anchorage                          |

All meetings will be from 4:30 PM to 8 PM with a presentation at 5:30 PM.

### The Purpose

The Alaska Department of Transportation and Public Facilities (DOT&PF) is updating the statewide long-range transportation plan (LRTP), which will provide future direction for our highways, aviation, transit, rail, marine, bicycle, and pedestrian transportation. The LRTP, written with agency and public collaboration, will develop Alaska's transportation priorities based on the common interests and needs of Alaskans statewide.

### DOT&PF wants to hear from you!

*Imagine the future... It's 2035. What will our transportation infrastructure look like? What works well today? What else will the future bring? What will come of our transportation system? What types of transportation will we use? What needs improvement now, five years from now, or well into the future?*

### How do we plan for the future?

We will hold three Public Open Houses this spring in Anchorage, Fairbanks and Wasilla with an On-line open house to follow in the fall. To learn more about the planning process, sign up for e-mail notifications, or send us your comments, visit the website below.  
[www.dot.alaska.gov/lrtpplanupdate](http://www.dot.alaska.gov/lrtpplanupdate)

DOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. Full Title VI Nondiscrimination Policy: [www.dot.alaska.gov/vst\\_statement.shtml](http://www.dot.alaska.gov/vst_statement.shtml). To file a complaint go to: [www.dot.alaska.gov/cvtrts/titlevi.shtml](http://www.dot.alaska.gov/cvtrts/titlevi.shtml). DOT&PF complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to participate in this public meeting should contact Julie Ileson, 907-644-2075, Public Involvement Manager, or Alaska Relay at telephone number: 711. Request should be made at least 5 days before the accommodation is needed make any necessary arrangements.

### Small Group Presentations

A series of presentations were also made throughout the development of the LRTP to the following groups, agencies, and organizations as part of the stakeholder and public outreach process:

- Alaska Community & Public Transportation Advisory Board
- Alaska Municipal League
- Alaska Statewide Trails Conference
- Alaska Trails
- Alaska Transit Conference
- Alaska Tribal Transportation Symposium
- AMATS Technical Committee
- Bureau of Indian Affairs Provider's Conference
- Fairbanks Chamber of Commerce Transportation Committee
- Fairbanks Metropolitan Area Transportation System (FMATS) Technical Committee
- Kodiak Rural Regional Leadership Forum Transportation Work Session
- National Tribal Transportation Conference (Anchorage)
- The Mat-Su Transportation Advisory Board



Presentations made to these groups included discussions of the overall approach and purpose of the planning processes, stakeholder and public outreach methods for those contributing inputs and comments, Alaska's transportation issues and trends, funding challenges, and plan timeline. The inputs and feedback provided by the groups to the DOT&PF were used to support the planning process and development of the LRTP.

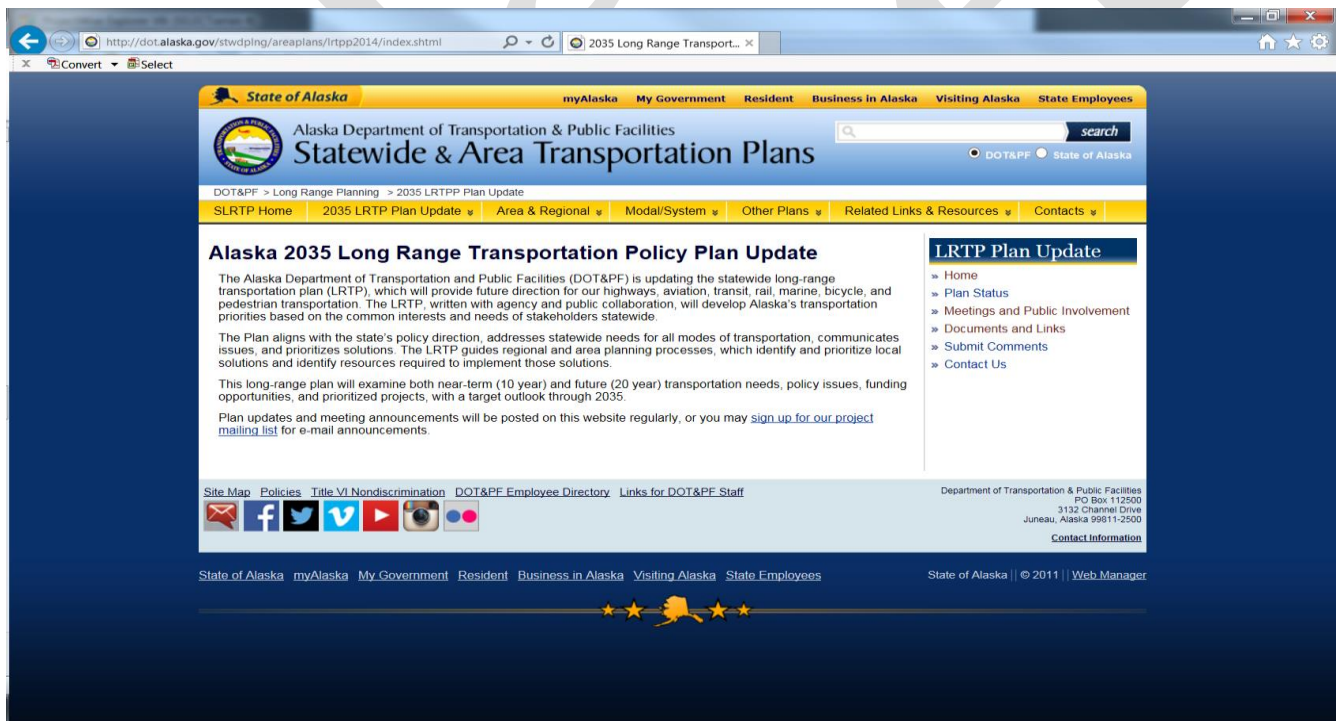
### Newsletters/Fact Sheets

One e-mail newsletter was distributed to more than 900 individuals on the project's mailing list. The newsletter was opened by 34 percent of recipients, nearly 280 people. The primary purpose of the mailing was to alert people to the May 2014 open houses and to solicit comment through the project website. A second e-mail announcement will be sent to individuals on the project e-mail list to announce availability of the draft plan, and the online open house.

### Project Website

DOT&PF created a LRTP project website ([www.dot.alaska.gov/lrtppplanupdate](http://www.dot.alaska.gov/lrtppplanupdate)) as shown in Exhibit 14, which was hosted on the Department's Statewide and Area Transportation Plans site section. The website included information on the plan status and schedule, project and related documents, meeting information (including TSG and FAC meeting materials), and a mechanism for submitting comments. Individuals were encouraged to sign up for the project mailing list via the website.

Exhibit 14: Let's Keep Moving 2036 Website Screenshot





### ***Online Open House***

The draft plan will be available for review on the project website and via an online open house. The online open house will be available throughout the 45-day comment period as a means to solicit public input about the strategies, recommendations, and outcomes of the planning process. The online open house will be advertised through print and online ads, listserv announcements (including the State of Alaska's online public notices) and an e-newsletter to be sent to more than 900 individuals and organizations on the project mailing list.

The resulting public comment and input will be used to help refine the Final LRTP. The online open house format will include information and seek input on the plan vision, trends, policy goals, funding challenges, measures and benchmarks, and implementation strategies. Comments received through the online open house will be used to shape the final plan.

### ***Comments***

Through the entire stakeholder and public outreach process, e-mail, handwritten, and web-submitted comments were tracked by individual commenter, delivery method (mail, e-mail, open house comment, etc.), date submitted, and issue area(s). Comments received through December 14, 2014 were considered as part of this draft document. The final set of comments will be submitted to the DOT&PF in a database as part of the documentation of this planning process.

### **Stakeholder and Public Input to Let's Keep Moving 2036 Plan**

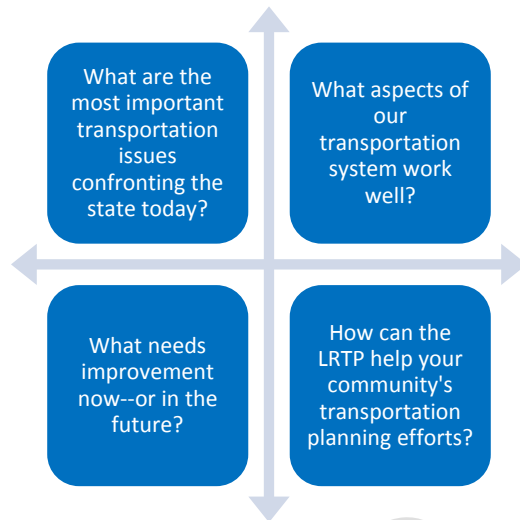
Through this outreach process, individuals were invited to submit comment forms at the open houses or to submit comments online via the project website. While some of these considered local transportation issues and local projects, such as the Juneau Access Improvements Project, others addressed financing, connectivity, plan goals, specific modes of transportation, transportation needs in rural Alaska, and missing elements. As of December 2014, more than 149 individual comments were received from 43 individuals and organizations from across the state<sup>2</sup>. The majority of these were comments received at the May 2014 open house events.

During the outreach process, the key questions and themes presented in Exhibit 15 were asked by the DOT&PF of the public. The DOT&PF's communications emphasized that the statewide plan is about the state's overall Vision. It sets policy and identifies performance measures that, in turn, meet the stated vision and guide state and regional planning processes. Specific projects, local solutions, and implementation resources needed are identified through more focused regional plans.

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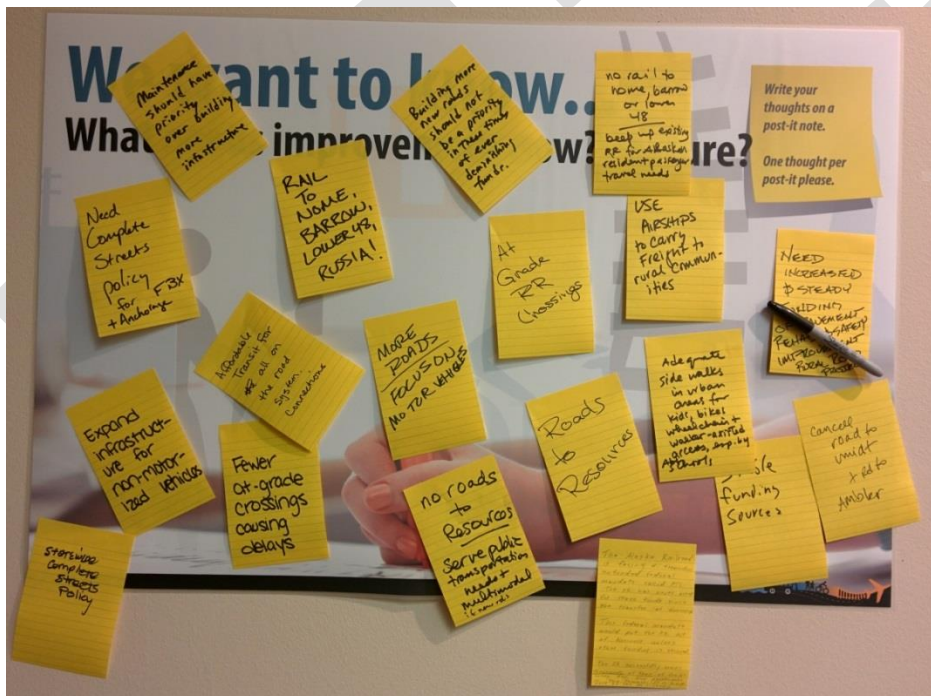
<sup>2</sup> This figure does not include a number of Anonymous comments received at the public open houses.

Exhibit 15: Key Public Themes and Responses to Support Public Involvement



The format of the public open houses encouraged participants to think long-term about statewide issues and concerns. Participants placed post-it note comments (Exhibit 16) or provided written comment forms in response to these questions and to pose other questions, concerns, or ideas.

Exhibit 16: Sample of Public Comments Posted at the Fairbanks Open House



As a whole, comments from the open houses ranged from support for “roads to resources” to opposition to mega projects that re-allocate funding from more pressing projects and policies that better address community needs. Comments offered support for multiple modes of transportation,

from trails, to airports, ferries, rail, and highways. Some comments expressed support for specific design features, while others voiced support or opposition for specific local projects. Transit was a recognized need throughout the comments received through the various outreach events. Exhibit 17 is a summary of responses to those questions.

Exhibit 17: Public Comments Heard at Public Open Houses (by Region)

| Fairbanks  | Wasilla   | Anchorage   |
|--|---|---|
| <i>What works well</i>   |   |   |
| FMATS (as an agency)   | Bike trails   | Coordinated (smart) traffic lights  |
| More funding to maintenance; less to mega projects                 | Overpasses  | Service levels in specific corridors  |
| Identifying road maintenance [needs] is fairly responsive          | Frontage roads  | Rural airports  |
|  | Park-n-Rides  | Roundabouts   |
|  |   | Project teams work well when they have clear direction—with public and with property owners.  |
| <i>What performance measures would you recommend</i>               |   |   |
| Infrastructure condition and safety                                | Satisfaction surveys/public comments                                    | Regional support for projects, prioritized by mode  |
| Mega project planning is wasteful                                  | Time to get between points at key times (e.g. rush hour)                | AADT, Safety, Support of Economic Development   |
| More state dollars to more road service districts (more districts) | We need roads that do not to be resurfaced so often.                    | Number of households/DUs within ¼, ½ mile of transit routes   |
| Access to transit for all areas on the road system                 | Opportunity to bypass stop and go shopping district for through traffic | Multi-model level of service metrics  |
| No more double trailers  | Rear-end accidents  | Service levels for existing demand  |
| Infrastructure maintenance and repair                              | Consistent travel times from point A to point B                         | Performance measure needed for integration of transportation into the fabric of a healthy community; complete streets. Do not develop measures focusing just on vehicle movement! |
| Reliable, safe ferry operations, both long- and short-run routes   |   | Rough fiscal balance; prioritize  |
| Fix roads before building new ones                                 |   | Less talk, more action; getting things done with infrastructure   |
| Miles of roads; flow (speed) high                                  |   | Reduction in fatal accidents/crashes  |

| Fairbanks  | Wasilla   | Anchorage   |
|--|---|---|
| Long- and short-route ferries as important part of public access in Southeast and Gulf of Alaska AND as part of tourism. |   | # of linear feet of separated pathways in good or better condition  |
| Evaluate construction and maintenance costs in a changing climate (i.e. 50 year projections)                             |   | # of linear feet of pedestrian infrastructure within state-owned right-of-way                                   |
| Condition of existing infrastructure   |   | Cost effective/bang for buck  |
| Congestion level and transit times   |   |   |
| Watch/weigh application of weight restrictions and indication of inadequate road condition                               |   |   |
| Pedestrian accessibility in all seasons  |   |   |
| Bike accessibility of bike trails in winter—yes. There are a lot of winter bike commuters                                |   |   |
| For freight transport:<br>Ton/miles per dollar<br>Ton/miles per gallon of fuel<br>Ton/miles per accident                 |   |   |
| For city busses:<br>Timeliness of arrivals<br>Usefulness of routes   |   |   |
| Air pollution reduction with less traffic and more public transportation to help Fairbanks get healthy air.              |   |   |
| <i>What needs improvement now and in the future?</i>   |   |   |
| Cancel megaprojects that only benefit limited areas  | More transit, especially for seniors                          | More bike/ped infrastructure; culvert improvements for fish   |
| Adequate sidewalks in urban areas for kids, bikes, wheelchairs, and walker-assisted access, especially by schools        | More highway connections to reduce congestion                 | Build for a long range plan. Consider, but do not be dictated by, local neighborhood. NIMBY will always oppose! |
| Stable funding sources   | Legislation statewide for two ways in and out of subdivisions | Communication with Regions to set priorities and integrate projects into emerging growth areas (Mat-Su, Kenai)  |

| Fairbanks   | Wasilla  | Anchorage  |
|---|--|--|
| Roads to resources  |  | Neighborhood concerns and wishes need to be listened to and incorporated into development plans. If the adjacent neighbors don't want a project, it should not move forward. |
| The Alaska Railroad is facing a tremendous unfunded federal mandate called PTC (positive train control). The railroad has never asked for state funds since the transfer of ownership. This federal mandate would put the railroad out of business unless other funding is secured. | Communication between the state agencies involved in transportation (i.e. DOT&PF/DHSS/DOE/DOC) | Protect against residential encroachment on airports, local as well as statewide.  |
| No roads to resources   | Local bus service needs huge expansion and improvement ASAP                                    | Clean the slate; work with communities and regions to pare "wants" to "needs"  |
| Serve public transportation needs and multimodal [connections] if new roads   | Sidewalks and bike trails  | Protect adjacent established residential neighborhoods from encroaching airports   |
| More roads, focus on motor vehicles   | Commuter/passenger rail service in metropolitan regions  | Transparency of decision-making process, with clear decision metrics   |
| At-grade railroad crossings   | Timing of traffic lights   | Get the politics out of STIP decisions   |
| Beef up existing railroad for Alaskan resident and passenger travel needs   |  | Use airships to carry freight to rural communities   |
| Statewide complete streets policy   |  | Sustainable decision making—we can't start and stop projects or not complete what we start   |
| Expand infrastructure for non-motorized vehicles  |  | Process too political—we <u>have</u> to say <u>no</u> sometimes, we cannot afford everything   |
| Maintenance should have priority over building more infrastructure  |  | Better bus service and public transportation   |
| Affordable transit for all on the road system—connections   |  | Maintain existing transportation elements in good condition, Fix what we have  |
| Fewer at-grade crossing causing delays  |  | Bike and pedestrian trails; public transportation  |

| Fairbanks   | Wasilla | Anchorage  |
|---|---------|--|
| Expand freight rail connections   |         | Better maintenance and preservation; safety upgrades                             |
| Building more new roads should not be a priority in these times of ever diminishing funds                 |         | Taxing authority—need some skin in the game for communities with means           |
| Need increased and steady funding of pavement rehabilitation and safety improvement, rural road projects. |         | We need a non-motorized plan (walking, biking, etc.); we need more commuter rail |

During the open houses, participants were also polled about what they consider to be the most important transportation issues facing the state (Exhibit 18). Not unexpectedly, financing transportation strategies, projects, and actions were ranked as the most critical concern of the public participants attending the open houses. Connectivity of transportation systems and modes, including linkages from roadway systems, transit services, and other systems were also of critical importance to the public. Public participation, environmental, and economic development issues were the next three highest concerns. For example, the DOT&PF’s ability to continue providing methods in which the public could consistently participate in the planning process is of critical concern, as are the agency’s continued assessment of growing environmental concerns and the need to develop transportation –related strategies, policies, and programs that can help foster the economic growth of communities and businesses throughout the state.

**Exhibit 18: Open House Participant Poll: What are the Most Critical Issues Facing Alaska’s Transportation System?**

| Issue                            | Number of Responses* |
|----------------------------------|----------------------|
| <b>Financing</b>                 | 16                   |
| <b>Connectivity</b>              | 10                   |
| <b>Public Involvement</b>        | 8                    |
| <b>Environment</b>               | 7                    |
| <b>Economic Development</b>      | 7                    |
| <b>Freight</b>                   | 3                    |
| <b>Goals/Objectives/Policies</b> | 3                    |
| <b>Other</b>                     | 3                    |
| <b>Transportation Issues</b>     | 2                    |

*\*Overall rating from open house participants only—not a statistically valid sample*

Additional comments will be received by DOT&PF during a 45-day public review on this draft document. Comments received via the website, e-mail, or the online open house will be considered in the final LRTP.

## KEY CHARACTERISTICS AND TRENDS

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This section describes the comprehensive technical analyses that were conducted of Alaska's transportation baseline and historical and future projections of trends in order to identify the risks that will impact the future performance of the transportation system and determine which risks require planning. This section discusses the following trends in more detail:

- **Demographics, employment, and economics.** Trends that affect the amount and type of transportation demand in Alaska, including population and economic growth and changing customer expectations and priorities. These trends all directly affect future travel demand.
- **Visitation/seasonality.** Trends that affect seasonal travel demand, driven by tourism and the availability of transportation infrastructure across seasons.
- **Travel demand.** Trends that arise from analyzing statewide vehicle miles traveled (VMT), motor vehicle registrations, and commuting modes.
- **Climate change/extreme weather events.** Trends that will adversely affect the condition of transportation infrastructure and increase the costs to operate and maintain the system over time.
- **Freight.** Trends that drive the market demand for freight transportation, including growth/changes to freight intensive and resource development industries, by which the state's overall economy and quality of life are dependent.
- **Safety.** Trends that impact the design, construction, operation of safe highways, ferries, and airports.

The analyses of these trends have informed the development of a Plan Vision and supporting policy goals and actions to guide future transportation investment to meet the needs of the State. The Plan Vision and supporting policy goals and actions can be found in the *Policy Plan* document.

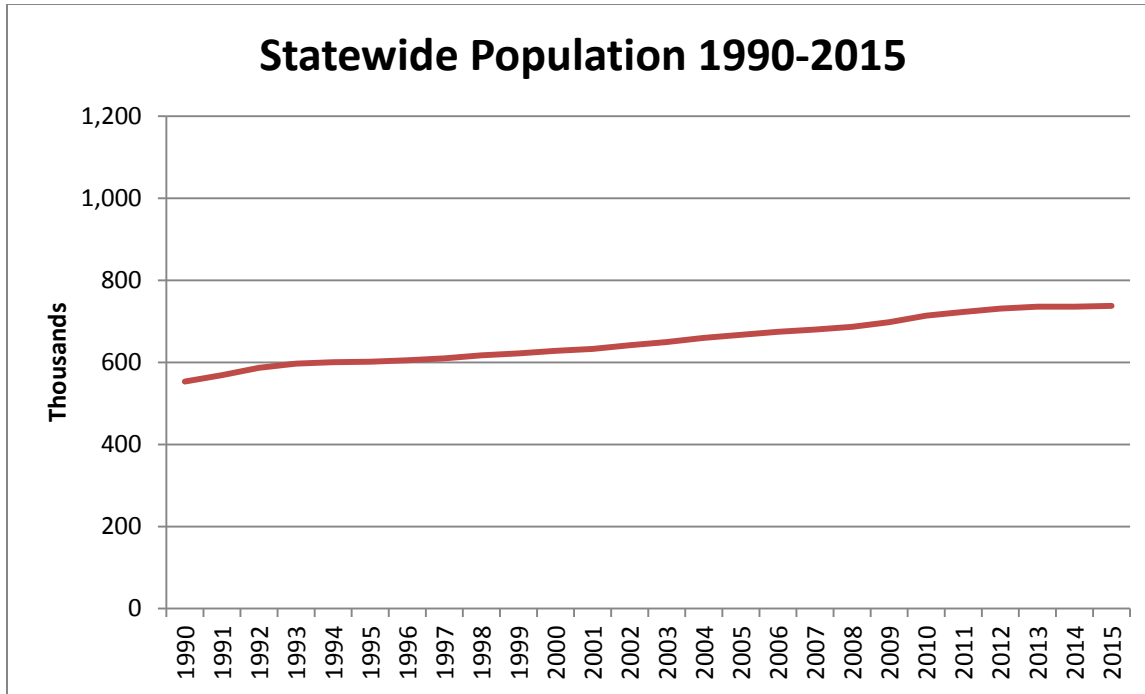


## Demographics, Employment, and Economics

### Current Population Trends

- Alaska’s population has increased by 33 percent, or at an annual average rate of 1.2 percent between 1990 and 2015, (Exhibit 19).
- As of 2015, the state’s population is 737,625.

Exhibit 19: Alaska Statewide Population, 1990 to 2015



Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

- Population growth has been uneven across the state. Between 1990 and 2015, the Anchorage/Mat-Su Region was the fastest growing region in the state, with an increase of 50.0 percent.
- The Northern Region was the second fastest growing region (36.4 percent), followed by the Gulf Coast (26.6 percent).

The Southeast Region experienced the smallest amount of growth (0.04 percent).

Exhibit 20 illustrates percent change of population by region and the boroughs that comprise each region. Percentages in red represent a projected decline in population.

Exhibit 20: Alaska Population by Region, Percent Change from 1990 to 2015

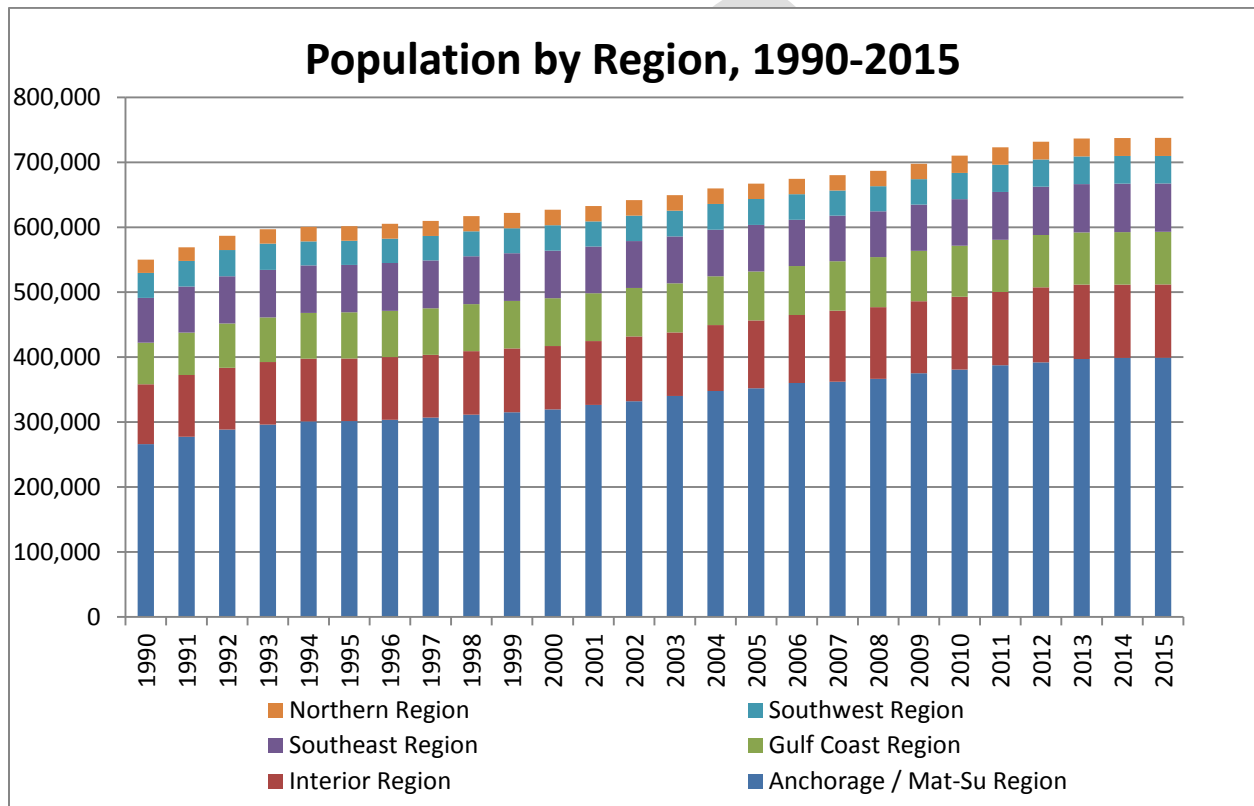
| Region                                      | 1990           | 2015           | Percent change, 1990-2015 |
|---|----------------|----------------|---------------------------|
| <b>Anchorage / Mat-Su Region</b>            | <b>266,021</b> | <b>399,086</b> | <b>50.0%</b>              |
| Anchorage, Municipality of                  | 226,338        | 298,908        | 32.1%                     |
| Matanuska-Susitna Borough                   | 39,683         | 100,178        | 152.4%                    |
| <b>Northern Region</b>                      | <b>20,380</b>  | <b>27,802</b>  | <b>36.4%</b>              |
| Nome Census Area                            | 8,288          | 10,040         | 21.1%                     |
| North Slope Borough                         | 5,979          | 9,895          | 65.5%                     |
| Northwest Arctic Borough                    | 6,113          | 7,867          | 28.7%                     |
| <b>Gulf Coast Region</b>                    | <b>64,063</b>  | <b>81,111</b>  | <b>26.6%</b>              |
| Kenai Peninsula Borough                     | 40,802         | 57,763         | 41.6%                     |
| Kodiak Island Borough                       | 13,309         | 13,819         | 3.8%                      |
| Valdez-Cordova Census Area                  | 9,952          | 9,529          | -4.3%                     |
| <b>Interior Region</b>                      | <b>92,111</b>  | <b>112,818</b> | <b>22.5%</b>              |
| Denali Borough                              | 1,764          | 1,781          | 1.0%                      |
| Fairbanks North Star Borough                | 77,720         | 98,645         | 26.9%                     |
| Southeast Fairbanks Census Area             | 5,913          | 6,899          | 16.7%                     |
| Yukon-Koyukuk Census Area                   | 6,714          | 5,493          | -18.2%                    |
| <b>Southwest Region</b>                     | <b>38,479</b>  | <b>42,413</b>  | <b>10.2%</b>              |
| Aleutians East Borough                      | 2,464          | 2,854          | 15.8%                     |
| Aleutians West Census Area                  | 9,478          | 5,649          | -40.4%                    |
| Bethel Census Area                          | 13,656         | 18,153         | 32.9%                     |
| Bristol Bay Borough                         | 1,410          | 887            | -37.1%                    |
| Dillingham Census Area                      | 4,012          | 5,007          | 24.8%                     |
| Lake and Peninsula Borough                  | 1,668          | 8,195          | 391.3%                    |
| Kusilvak Census Area                        | 5,791          | 1,668          | -71.2%                    |
| <b>Southeast Region</b>                     | <b>68,989</b>  | <b>69,018</b>  | <b>0.04%</b>              |
| Haines Borough                              | 2,117          | 2,493          | 17.8%                     |
| Juneau, City and Borough of                 | 26,751         | 33,277         | 24.4%                     |
| Ketchikan Gateway Borough                   | 13,828         | 13,778         | -0.4%                     |
| Prince of Wales-Outer Ketchikan Census Area | 6,278          | 6,446          | 2.7%                      |
| Sitka, City and Borough of                  | 8,588          | 8,929          | 4.0%                      |
| Skagway-Hoonah-Angoon Census Area           | 3,680          | 1,040          | -71.7%                    |
| Wrangell, City and Borough of               | 7,042          | 2,442          | -65.3%                    |
| Yakutat, City and Borough of                | 705            | 613            | -13.0%                    |

Sources: Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Census Bureau

- The Anchorage/Mat-Su region is the most populated region in the state and since 1994, more than half of the state's residents reside in this region.
- In 2015 the Anchorage/Mat-Su region comprised 54.1 percent of the statewide population, the Interior region comprised 28.1 percent, and the Gulf Coast region comprised 11.0 percent.
- The Anchorage/Mat-Su region and the Interior region contain the state's two most populated boroughs—Anchorage and Fairbanks. In 2015, the population in Anchorage was 298,908 and the population in Fairbanks was 98,645 representing 40.8 percent and 15.4 percent of the statewide population, respectively.

Exhibit 21 illustrates the distribution of the state's population by region.

Exhibit 21: Alaska Population by Region, 1994 to 2015



Sources: Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Census Bureau

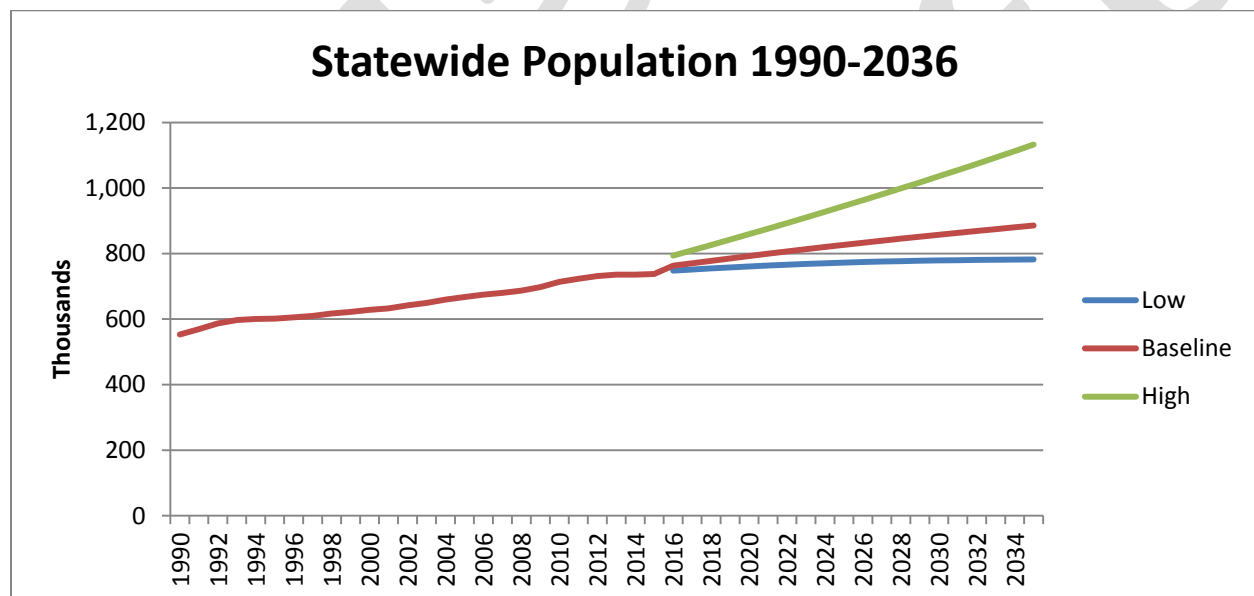
## Population Projections

### Statewide Projections

- The state’s baseline population projection indicates that the population is forecasted to increase from 737,625 people in 2015 to 885,846 people by 2035—a 20 percent increase over the 20-year period (Exhibit 22).
- The population projections prepared by the Department of Labor and Workforce Development, Research and Analysis Section utilize three scenarios—a baseline scenario, and to account for the unpredictable and uncertain nature of growth, two additional growth scenarios (low and high):
  - The baseline scenario assumes an annual net-migration ratio of zero, as Alaska’s net migration has averaged zero for the past two decades, and holds mortality, fertility, and out-migration rates constant. Annual growth is expected to be slow as the population ages over the next few years.
  - The low scenario projection assumes a ratio of -0.5 percent.
  - The high scenario projection assumes an annual net-migration of 1 percent.

These projections do not take into account the construction of the Alaska Natural Gas Pipeline project or the recent economic downturn. However, the Alaska Department of Labor and Workforce Development, Research and Analysis section will released updated population projection in April 2016 that will account for this downturn.

Exhibit 22: Alaska Statewide Population Trends and Forecasts, 1990 to 2015 Historical, 2016-2035 Projection



Source: Alaska Population Projections 2012 to 2042, prepared by Alaska Department of Labor and Workforce Development, Research and Analysis Section

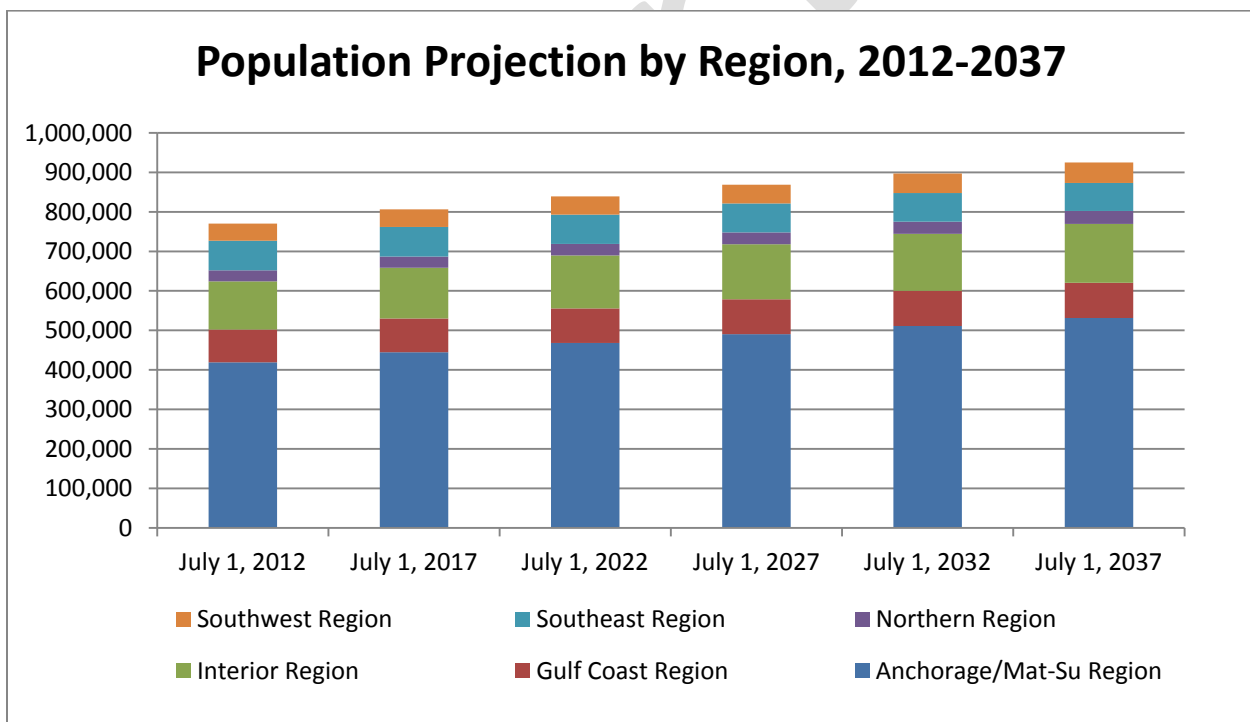
### Regional Projections

The regional projections were based on a set of assumptions developed from recent trends and knowledge of the specified populations; each borough/census was assigned its own unique mortality, fertility, and migration rates.

- While the statewide population increase is relatively modest, population will continue to grow in urban areas—which will lead to an increase in travel demand, congestion, and the expectation for increased intermodal access and new and expanded facilities to correspond with demand.
- The Anchorage/Mat-Su Region is expected to experience the fastest population growth (26.8 percent).
- The only region expected to lose population is the Southeast Region (-4.9 percent).

Exhibit 23 identifies the population projections between 2012 and 2037 for each region.

Exhibit 23: Alaska Population Forecasts by Region in Five-Year Increments, 2012 to 2037



Sources: Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Census Bureau

- Municipality of Anchorage, the Fairbanks North Star Borough, and Mat-Su are the three most populated regions in the state—and between 2012 and 2037:
  - The Anchorage population is expected to increase by 16.4 percent.

- The Fairbanks population will increase by 23.6 percent.
- The Mat-Su population is expected to increase by 57.5 percent, the highest of any borough in the state—this surge in population will result in more localized congestion, particularly as a result from increased trips between Mat-Su and Anchorage.

Exhibit 24 illustrates percent change of population by region and the boroughs that comprise each region between 2012 and 2037. Percentages in red represent a projected decline in population.

Exhibit 24: Alaska Population Forecasts by Region in Five-Year Increments, Percent Change from 2012 to 2037

| Region/Borough                    | July 1, 2012   | July 1, 2017   | July 1, 2022   | July 1, 2027   | July 1, 2032   | July 1, 2037   | % change, 2012-2037 |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------|
| <b>Anchorage/Mat-Su Region</b>    | <b>418,965</b> | <b>444,457</b> | <b>468,313</b> | <b>490,485</b> | <b>511,276</b> | <b>531,209</b> | <b>26.8%</b>        |
| Municipality of Anchorage         | 313,348        | 326,612        | 338,059        | 347,870        | 356,584        | 364,871        | 16.4%               |
| Matanuska-Susitna Borough         | 105,617        | 117,845        | 130,254        | 142,615        | 154,692        | 166,338        | 57.5%               |
| <b>Gulf Coast Region</b>          | <b>83,321</b>  | <b>85,517</b>  | <b>87,147</b>  | <b>88,162</b>  | <b>88,729</b>  | <b>89,067</b>  | <b>6.9%</b>         |
| Kenai Peninsula Borough           | 59,225         | 61,391         | 63,116         | 64,321         | 65,098         | 65,647         | 10.8%               |
| Kodiak Island Borough             | 14,245         | 14,402         | 14,479         | 14,473         | 14,460         | 14,435         | 1.3%                |
| Valdez-Cordova Census Area        | 9,851          | 9,724          | 9,552          | 9,368          | 9,171          | 8,985          | -8.8%               |
| <b>Interior Region</b>            | <b>121,969</b> | <b>128,363</b> | <b>134,073</b> | <b>139,238</b> | <b>144,166</b> | <b>149,162</b> | <b>22.3%</b>        |
| Denali Borough                    | 1,848          | 1,806          | 1,771          | 1,720          | 1,661          | 1,609          | -12.9%              |
| Fairbanks North Star Borough      | 106,822        | 112,843        | 118,191        | 123,018        | 127,560        | 132,030        | 23.6%               |
| Southeast Fairbanks Census Area   | 7,885          | 8,553          | 9,184          | 9,799          | 10,425         | 11,112         | 40.9%               |
| Yukon-Koyukuk Census Area         | 5,414          | 5,161          | 4,927          | 4,701          | 4,520          | 4,411          | -18.5%              |
| <b>Northern Region</b>            | <b>27,953</b>  | <b>28,565</b>  | <b>29,193</b>  | <b>30,006</b>  | <b>31,143</b>  | <b>32,680</b>  | <b>16.9%</b>        |
| Nome Census Area                  | 10,283         | 10,688         | 11,103         | 11,597         | 12,211         | 12,997         | 26.4%               |
| North Slope Borough               | 9,638          | 9,544          | 9,465          | 9,460          | 9,563          | 9,757          | 1.2%                |
| Northwest Arctic Borough          | 8,032          | 8,333          | 8,625          | 8,949          | 9,369          | 9,926          | 23.6%               |
| <b>Southeast Region</b>           | <b>74,863</b>  | <b>74,849</b>  | <b>74,384</b>  | <b>73,511</b>  | <b>72,419</b>  | <b>71,170</b>  | <b>-4.9%</b>        |
| Haines Borough                    | 2,679          | 2,716          | 2,736          | 2,735          | 2,707          | 2,649          | -1.1%               |
| Hoonah-Angoon C.A.                | 2,112          | 1,999          | 1,883          | 1,764          | 1,644          | 1,534          | -27.4%              |
| Juneau Borough                    | 33,419         | 33,839         | 34,045         | 34,042         | 33,879         | 33,617         | 0.6%                |
| Ketchikan Gateway Borough         | 13,938         | 13,843         | 13,644         | 13,369         | 13,071         | 12,762         | -8.4%               |
| Petersburg Census Area            | 3,197          | 3,097          | 2,989          | 2,850          | 2,709          | 2,574          | -19.5%              |
| Prince of Wales-Outer Ketch. C.A. | 6,399          | 6,324          | 6,241          | 6,159          | 6,098          | 6,027          | -5.8%               |
| Sitka Borough                     | 9,084          | 9,020          | 8,893          | 8,724          | 8,520          | 8,300          | -8.6%               |
| Skagway Municipality              | 986            | 1,015          | 1,021          | 1,014          | 1,013          | 1,005          | 1.9%                |
| Wrangell City and Borough         | 2,451          | 2,431          | 2,393          | 2,347          | 2,298          | 2,243          | -8.5%               |
| Yakutat Borough                   | 598            | 565            | 539            | 507            | 480            | 459            | -23.2%              |
| <b>Southwest Region</b>           | <b>43,346</b>  | <b>44,728</b>  | <b>46,081</b>  | <b>47,500</b>  | <b>49,301</b>  | <b>51,754</b>  | <b>19.4%</b>        |
| Aleutians East Borough            | 3,213          | 3,201          | 3,187          | 3,169          | 3,140          | 3,120          | -2.9%               |

| Region/Borough             | July 1, 2012 | July 1, 2017 | July 1, 2022 | July 1, 2027 | July 1, 2032 | July 1, 2037 | % change, 2012-2037 |
|----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------|
| Aleutians West Census Area | 5,868        | 5,862        | 5,844        | 5,798        | 5,727        | 5,639        | -3.9%               |
| Bethel Census Area         | 18,404       | 19,246       | 20,103       | 21,040       | 22,200       | 23,696       | 28.8%               |
| Bristol Bay Borough        | 961          | 933          | 897          | 851          | 818          | 779          | -18.9%              |
| Dillingham Census Area     | 5,027        | 5,066        | 5,104        | 5,151        | 5,221        | 5,341        | 6.2%                |
| Lake & Peninsula Borough   | 1,703        | 1,732        | 1,742        | 1,746        | 1,751        | 1,779        | 4.5%                |
| Kusilvak Census Area       | 8,170        | 8,688        | 9,204        | 9,745        | 10,444       | 11,400       | 39.5%               |

Source: Alaska Population Projections 2012 to 2042, prepared by Alaska Department of Labor and Workforce Development, Research and Analysis Section

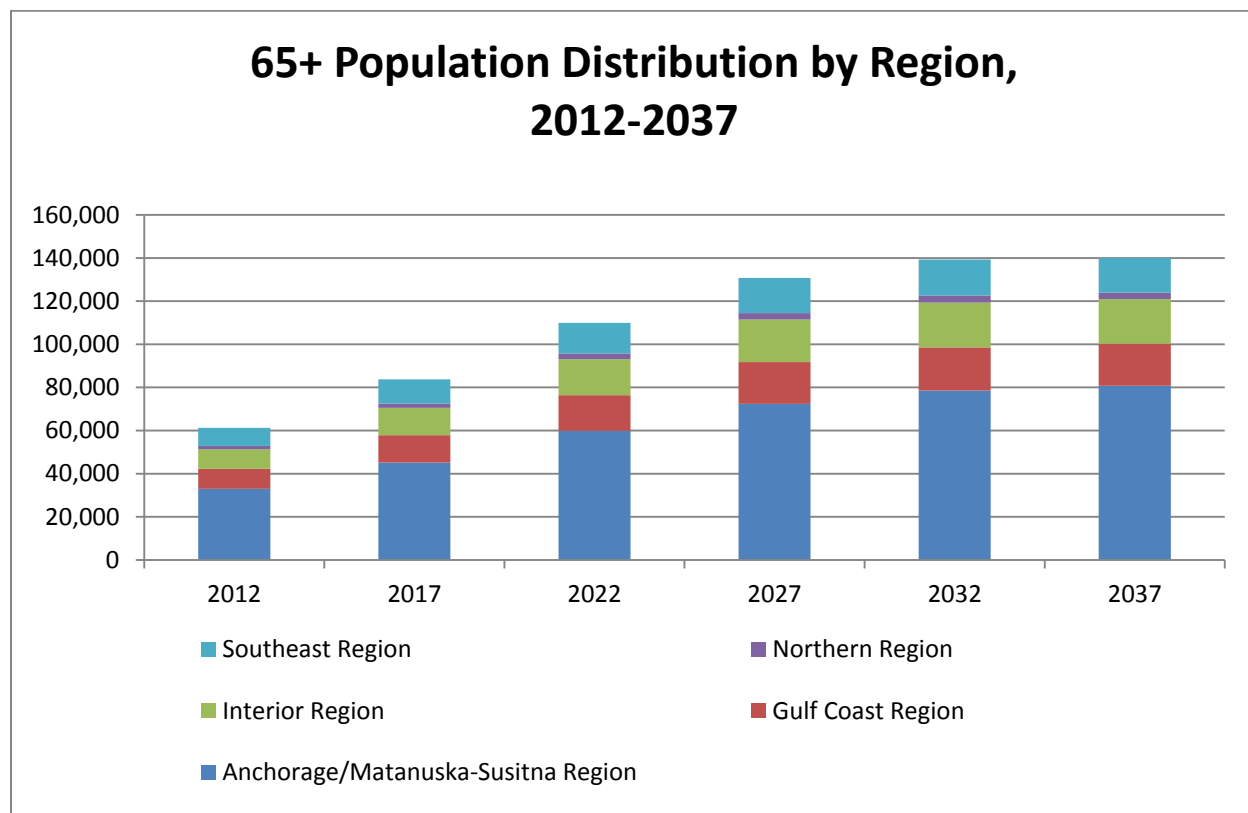
### Senior Population Projection

- Alaska's senior population is expected to grow at a faster rate than any other age group.
- Between 2012 and 2037, the senior population will increase 127 percent statewide. The growth is driven by the large cohort of aging baby boomers moving past age 65 over the next several years.
- The Anchorage/Mat-Su, Interior, and Gulf Coast regions will experience the greatest growth between 2012 and 2037:
  - The Anchorage/Mat-Su region will increase by 145 percent.
  - The Interior region will increase by 128 percent.
  - The Gulf Coast region will increase by 109 percent.

Since the elderly population is likely to drive less than those individuals in the prime employment years, they are not expected to contribute significantly to the overall statewide VMT. In addition, this population will require more specialized transportation options (e.g., more reliable transit or paratransit service) to meet their needs. Exhibit 25 illustrates the population projection for the 65+ age cohort.

[Exhibit 25: Alaska Statewide 65+ Population Growth Forecasts by Region, 2017 to 2037](#)





Source: Alaska Population Projections 2012 to 2042, prepared by Alaska Department of Labor and Workforce Development, Research and Analysis Section

#### Population of Alaskans with Disabilities

- Adults with disabilities are twice as likely as the population as a whole to have inadequate transportation. Therefore, transit is a key service for the disabled population in Alaska.
- Alaska has a significant population of individuals with disabilities. According to the 2008-2012 American Community Survey Data, approximately 11 percent of Alaska’s civilian, non-institutionalized population is disabled. The fraction is about the same in the Mat-Su Borough and the Municipality of Anchorage, while the proportions in the Fairbanks North Star Borough and Juneau are slightly less.
- Although the percentage of individuals with disabilities in the State has decreased by two percent since 2000, it is a population with relatively high dependence on transit. People with disabilities need accessible, affordable transportation options that allow them to reach employment, health care, education, housing, and the community at large.

## Veterans Population

- The proportion of veterans in Alaska is the largest of any other state, totaling nearly 15 percent of the population. This is significantly higher than the 10 percent nationwide average.<sup>3</sup>
- According to the 2008-2012 American Community Survey, 11 percent of veterans in Alaska are over the age of 65.<sup>4</sup> These elderly veterans are at a higher risk of having mobility issues and disabilities than the general population.
- The Fairbanks area is home to the largest percentage of veterans in the State, while Anchorage maintains the largest total number of veterans.<sup>5</sup>
- Similar to the elderly, the veteran population has unique transportation needs as many are disabled and need reliable transportation to access healthcare and other services (e.g., getting to and from Veterans Affairs facilities).

## Employment

Exhibit 26 below identifies the top 25 private employers in Alaska in 2010.

- The location of major employment centers affects commuting patterns:
  - The majority of employers have headquarters or their largest work site located in Anchorage, but only a few operate there exclusively. Carrs/Safeway is the only employer that is headquartered in Anchorage, but has stores in more than a dozen other communities.<sup>6</sup>
  - Seafood processors are located all over the state, particularly in coastal communities that are reliant on fishing, but none is located in Anchorage.
- In 1985, when the list was first compiled, only six companies had more than 1,000 employees, in contrast to 19 on the current list.

Exhibit 26: Alaska Statewide Top Private Employers by Region, 2010 (2010 most recent data)

| Rank | Firm name                    | Average monthly employment in 2010 | Type of business            | Headquarters or largest work site |
|------|------------------------------|------------------------------------|-----------------------------|-----------------------------------|
| 1    | Providence Health & Services | 4,000+                             | Hospital/medical center     | Anchorage                         |
| 2    | Walmart/Sam's Club           | 3,000 to 3,249                     | Grocery/general merchandise | Anchorage                         |
| 3    | Carrs/Safeway                | 2,750 to 2,999                     | Grocery                     | Anchorage                         |

<sup>3</sup> Alaska Department of Labor and Workforce Development (ADOL&WD). *Alaska Economic Trends*. April 2013. Volume 33. Number 4. ISSN 0160-3345

<sup>4</sup> U.S. Census Bureau, 2008-2012 American Community Survey. American FactFinder. Table S2101 Veteran Status [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_12\\_5YR\\_S2101](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_5YR_S2101).

<sup>5</sup> Alaska Division of Motor Vehicles, Department of Administration, 2013.

<sup>6</sup> <http://laborstats.alaska.gov/trends/jul11art1.pdf>

| Rank | Firm name  | Average monthly employment in 2010 | Type of business            | Headquarters or largest work site |
|------|--|------------------------------------|-----------------------------|-----------------------------------|
| 4    | Fred Meyer   | 2,500 to 2,749                     | Grocery/general merchandise | Anchorage                         |
| 5    | ASRC Energy Services                                 | 2,500 to 2,749                     | Oil field services          | Anchorage                         |
| 6    | Trident Seafoods                                     | 2,250 to 2,499                     | Seafood processing          | Akutan                            |
| 7    | BP Exploration Alaska                                | 2,000 to 2,249                     | Oil and gas extraction      | Anchorage                         |
| 8    | CH2M HILL  | 1,750 to 1,999                     | Oil field services          | Anchorage                         |
| 9    | NANA Management Services                             | 1,750 to 1,999                     | Catering/lodging/security   | Anchorage                         |
| 10   | Alaska Native Tribal Health Consortium (ANTHC)       | 1,500 to 1,749                     | Hospital/medical center     | Anchorage                         |
| 11   | Alaska Airlines                                      | 1,500 to 1,749                     | Air carrier                 | Anchorage                         |
| 12   | GCI Communications                                   | 1,250 to 1,499                     | Communications              | Anchorage                         |
| 13   | Banner Health (includes Fairbanks memorial Hospital) | 1,250 to 1,499                     | Hospital/medical center     | Fairbanks                         |
| 14   | Southcentral Foundation                              | 1,250 to 1,499                     | Hospital/medical center     | Anchorage                         |
| 15   | Yukon-Kuskokwim Health Corporation                   | 1,000 to 1,249                     | Hospital/medical center     | Bethel                            |
| 16   | FedEx  | 1,000 to 1,249                     | Air freight/courier service | Anchorage                         |
| 17   | ConocoPhillips Alaska                                | 1,000 to 1,249                     | Oil and gas extraction      | Anchorage                         |
| 18   | Alaska USA Federal Credit Union                      | 1,000 to 1,249                     | Financial services          | Anchorage                         |
| 19   | UPS (United Parcel Service)                          | 1,000 to 1,249                     | Air freight/courier service | Anchorage                         |
| 20   | McDonald's Restaurants of Alaska                     | 750 to 999                         | Eating establishment        | Anchorage                         |
| 21   | Wells Fargo  | 750 to 999                         | Financial services          | Anchorage                         |
| 22   | Doyon Universal Services                             | 750 to 999                         | Catering/lodging            | Anchorage                         |
| 23   | Home Depot   | 750 to 999                         | Building products           | Anchorage                         |
| 24   | Alaska Regional Hospital                             | 750 to 999                         | Hospital/medical center     | Anchorage                         |
| 25   | The Alaska Club                                      | 750 to 999                         | Health club                 | Anchorage                         |

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

When the public sector is included in the state's 10 largest employers, only four private sector employers remain in the top 10 (Exhibit 27).

- The public sector has grown more slowly than the private sector and will probably continue to do so, enabling more private-sector employers to populate the top rankings.
- In 2009, the Municipality of Anchorage ranked seventh on the list, but by 2010, its employment declined by 264, dropping down to number nine on the list behind Walmart/Sam's Club and Carrs/Safeway.<sup>7</sup>

<sup>7</sup> <http://laborstats.alaska.gov/trends/jul11art1.pdf>

Exhibit 27: Statewide Top 10 Private and Public Employers, 2010

| Rank | Firm name                    | Average monthly employment in 2010 |
|------|------------------------------|------------------------------------|
| 1    | Uniformed military           | 22,796                             |
| 2    | State of Alaska              | 18,337                             |
| 3    | Federal civilians            | 17,535                             |
| 4    | University of Alaska         | 7,579                              |
| 5    | Anchorage School District    | 7,157                              |
| 6    | Providence Health & Services | 4,000+                             |
| 7    | Walmart/Sam's Club           | 3,000 to 3,249                     |
| 8    | Carrs/Safeway                | 2,750 to 2,999                     |
| 9    | Municipality of Anchorage    | 2,846                              |
| 10   | Fred Meyer                   | 2,500 to 2,749                     |

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section; and U.S. Department of Defense, The Defense Manpower Data Center, May 13, 2010

Alaska has a relatively high concentration of public jobs—the demand for government jobs is driven by the extent of Federal and state land ownership and the role of the military in the Alaska economy, which leads to more natural resource jobs (e.g., jobs in agencies such as the Alaska Department of Natural Resources and the Department of Fish and Game) and higher levels of social services employment.

In addition, Alaska provides oversight that differs from other states, which also contributes to the high concentration of government jobs in the state:<sup>8</sup>

- DOT&PF operates an extensive ferry system to transport people and vehicles between coastal communities and supplement the state highway infrastructure.
- The Alaska Railroad Corporation is owned by the state but is the only government-run, full-service railroad in the country. It provided 667 jobs in 2013.
- Tribal government, which is a component of local government, has a prominent presence in Alaska. Tribes provide its members with employment training, counseling, and other family services. In 2013, tribal governments employed 3,643—which is 14 times more than tribal government employment nationwide.
- Rural boroughs and census areas have the highest per capita government employment to provide basic services—which is labor intensive when increased time and resources are necessary to reach remote populations. Yukon-Koyukuk Census Area has the highest per capita

<sup>8</sup> <http://laborstats.alaska.gov/trends/may15art3.pdf>

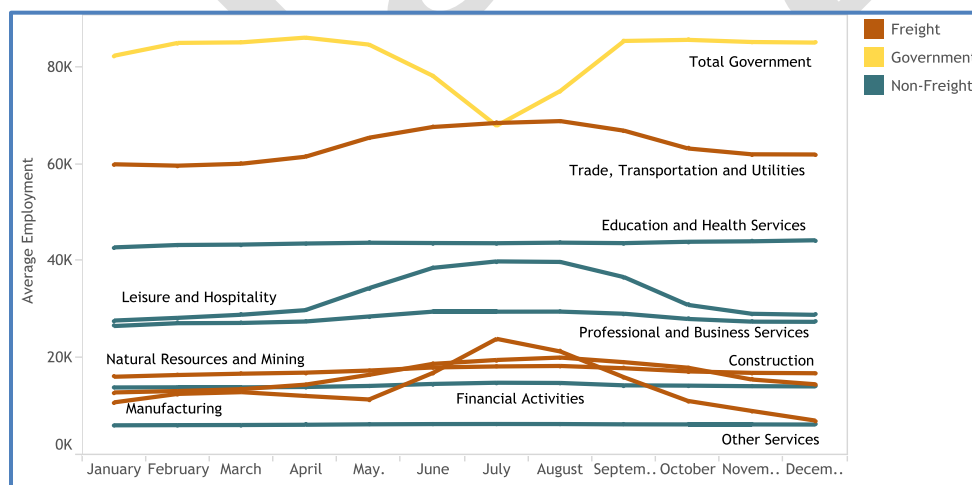
government employment, with 24.6 jobs per 100 residents. It has the largest land area of any county-equivalent in the U.S. and the lowest population density.

Alaska also receives more money per capita from the federal government; 24 percent of Alaska's fiscal year 2014 operating budget was provided by federal funds. Although the money is federal, it supports a large number of state and local government jobs.

### Economics

Alaska's severe winters have a large impact on the composition of the economy throughout the year. As illustrated in Exhibit 28, while government activity declines in summer months, leisure and hospitality employment increases, with other professional services remaining relatively constant. Freight-intensive industries are defined as those that handle freight as part of their primary business (including manufacturers, construction firms, transportation and warehousing businesses, retailers, manufacturers, utilities, and other natural resource producers) while non-freight industries are predominantly in the service sector, and while they may absolutely depend on freight services—their business is not primarily about moving freight. Freight-intensive industries show a general increase in summer months, with a fairly dramatic spike in manufacturing largely due to commercial fishing and processing, timber harvesting, and other seasonal activities. The highly seasonal nature of Alaska's economy means that freight transportation demand and requirements are seasonal as well. Imports of consumer goods decrease in the winter months as the state's population decreases, but imports of heating fuel and other sources of energy increase; materials to support tourism and leisure activities are most needed in the summer months.

Exhibit 28: Alaska Statewide Seasonality of Employment by Industry, 2009 to 2013 Average Employment by Month



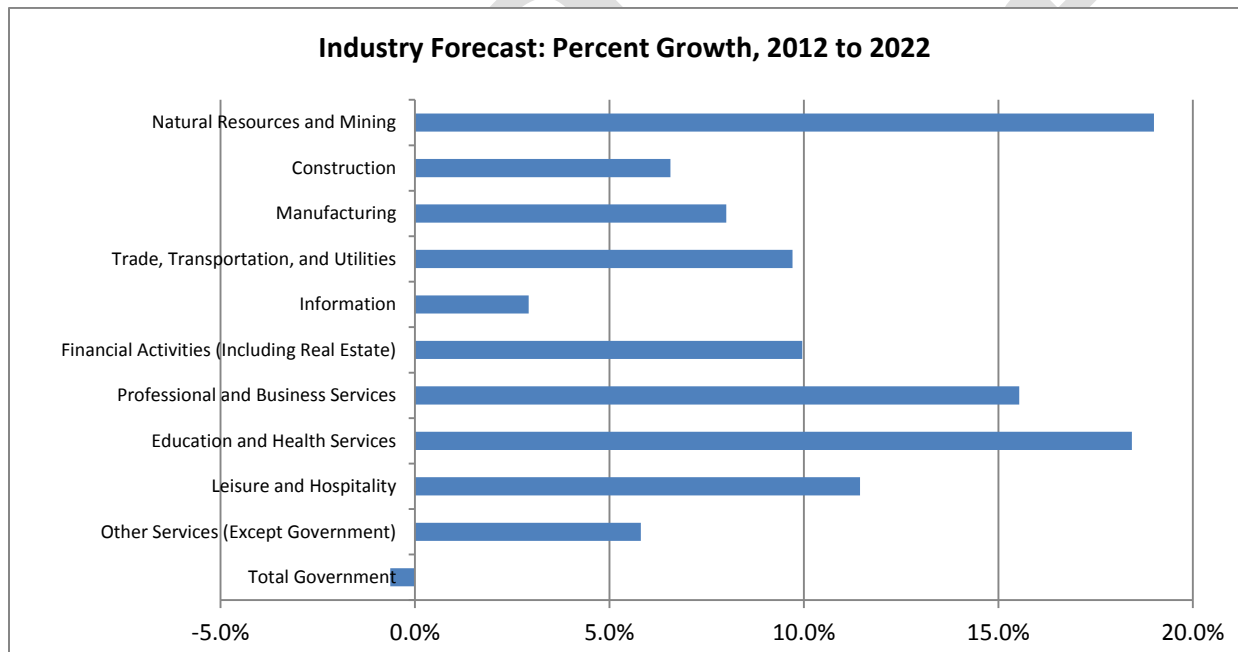
Source: Analysis of Alaska Department of Labor and Workforce Development data

**Industry Forecast**

Between 2012 and 2022, Alaska is projected to gain 36,133 jobs, which is a 10.8 percent increase—the statewide population is expected to increase by 10.3 percent during that same period. The two industries that are forecasted to experience the most growth between 2012 and 2022 are Natural Resources and Mining (19 percent) and Education and Health Services (18.4 percent). The demand for healthcare workers will be driven by the substantial senior population increase—the 65+ population will increase by 79 percent between 2012 and 2022. The increase in mining employment is driven by a combination of higher than average mineral commodity prices and the expansion of existing mines.<sup>9</sup> Exhibit 29 and Exhibit 30 provide a breakdown of the industry forecast between 2012 and 2022.

Government is the only sector projected to lose jobs—the federal job count is expected to drop 9 percent, and state and local government is projected to grow little to none. The federal government has been eliminating jobs in Alaska since 2011, with a decline of 588 jobs in 2012 and 833 jobs in 2013. These jobs reductions were mostly a result of federal budget problems and spending cuts from budget sequestration. Attrition and continued federal spending cutbacks in Alaska is expected to lead to further job loss. The stagnant growth of state and local government employment is attributed to reduced federal funding.<sup>10</sup>

**Exhibit 29: Alaska Statewide Economic Growth Forecasts by Industry, 2012 and 2022**



Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

<sup>9</sup> <http://laborstats.alaska.gov/trends/oct14art1.pdf>

<sup>10</sup> <http://laborstats.alaska.gov/trends/oct14art1.pdf>

Exhibit 30: Alaska Statewide Economic Percentage Growth Projection by Industry, 2012 and 2022

| Industry  | 2012<br>Estimated<br>Employment | 2022<br>Projected<br>Employment | Change<br>from 2012<br>to 2022 | Total<br>Percentage<br>Change |
|---|---------------------------------|---------------------------------|--------------------------------|-------------------------------|
| <b>Natural Resources and Mining</b>   | <b>18,062</b>                   | <b>21,494</b>                   | <b>3,432</b>                   | <b>19.0%</b>                  |
| <i>Agriculture, Forestry, Fishing and Hunting</i>                               | 1,033                           | 1,091                           | 58                             | 5.6%                          |
| <i>Mining</i>   | 17,029                          | 20,403                          | 3,374                          | 19.8%                         |
| <b>Construction</b>   | <b>16,545</b>                   | <b>17,632</b>                   | <b>1,087</b>                   | <b>6.6%</b>                   |
| <i>Construction of Buildings</i>  | 4,909                           | 5,630                           | 721                            | 14.7%                         |
| <i>Heavy and Civil Engineering Construction</i>                                 | 3,269                           | 3,374                           | 105                            | 3.2%                          |
| <i>Specialty Trade Contractors</i>  | 8,367                           | 8,628                           | 261                            | 3.1%                          |
| <b>Manufacturing</b>  | <b>13,894</b>                   | <b>15,006</b>                   | <b>1,112</b>                   | <b>8.0%</b>                   |
| <i>Food Manufacturing</i>   | 10,616                          | 11,319                          | 703                            | 6.6%                          |
| <i>Manufacturing, All Other</i>   | 3,278                           | 3,687                           | 409                            | 12.5%                         |
| <b>Trade, Transportation, and Utilities</b>                                     | <b>65,573</b>                   | <b>71,939</b>                   | <b>6,366</b>                   | <b>9.7%</b>                   |
| <i>Wholesale Trade</i>  | 6,373                           | 7,317                           | 944                            | 14.8%                         |
| <i>Retail Trade</i>   | 35,308                          | 38,823                          | 3,515                          | 10.0%                         |
| <i>Transportation and Warehousing</i>   | 21,717                          | 23,464                          | 1,747                          | 8.0%                          |
| <i>Utilities</i>  | 2,175                           | 2,335                           | 160                            | 7.4%                          |
| <b>Information</b>  | <b>6,189</b>                    | <b>6,370</b>                    | <b>181</b>                     | <b>2.9%</b>                   |
| <b>Financial Activities</b>   | <b>12,885</b>                   | <b>14,168</b>                   | <b>1,283</b>                   | <b>10.0%</b>                  |
| <i>Finance and Insurance</i>  | 7,023                           | 7,604                           | 581                            | 8.3%                          |
| <i>Real Estate and Rental and Leasing</i>                                       | 5,862                           | 6,564                           | 702                            | 12.0%                         |
| <b>Professional and Business Services</b>                                       | <b>29,337</b>                   | <b>33,895</b>                   | <b>4,558</b>                   | <b>15.5%</b>                  |
| <i>Professional, Scientific, and Technical Services</i>                         | 15,120                          | 17,578                          | 2,458                          | 16.3%                         |
| <i>Management of Companies and Enterprises</i>                                  | 2,559                           | 3,069                           | 510                            | 19.9%                         |
| <i>Administrative and Support and Waste Management and Remediation Services</i> | 11,658                          | 13,248                          | 1,590                          | 13.6%                         |
| <b>Education and Health Services</b>  | <b>76,123</b>                   | <b>90,154</b>                   | <b>14,031</b>                  | <b>18.4%</b>                  |
| <i>Educational Services, Public &amp; Private</i>                               | 31,219                          | 34,003                          | 2,784                          | 8.9%                          |
| <i>Health Care and Social Assistance, Public &amp; Private</i>                  | 44,904                          | 56,151                          | 11,247                         | 25.0%                         |
| <b>Leisure and Hospitality</b>  | <b>33,524</b>                   | <b>37,360</b>                   | <b>3,836</b>                   | <b>11.4%</b>                  |
| <i>Arts, Entertainment, and Recreation</i>                                      | 4,703                           | 5,259                           | 556                            | 11.8%                         |
| <i>Accommodation and Food Services</i>  | 28,821                          | 32,101                          | 3,280                          | 11.4%                         |
| <b>Other Services (Except Government)</b>                                       | <b>12,196</b>                   | <b>12,904</b>                   | <b>708</b>                     | <b>5.8%</b>                   |
| <b>Total Government</b>   | <b>49,323</b>                   | <b>49,009</b>                   | <b>-314</b>                    | <b>0.6%</b>                   |
| <i>Total State Government</i>   | 17,832                          | 18,774                          | 942                            | 5.3%                          |
| <i>Total Local Government</i>   | 17,123                          | 17,164                          | 41                             | 0.2%                          |
| <i>Total Federal Government</i>   | 14,368                          | 13,071                          | -1,297                         | -9.0%                         |

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section



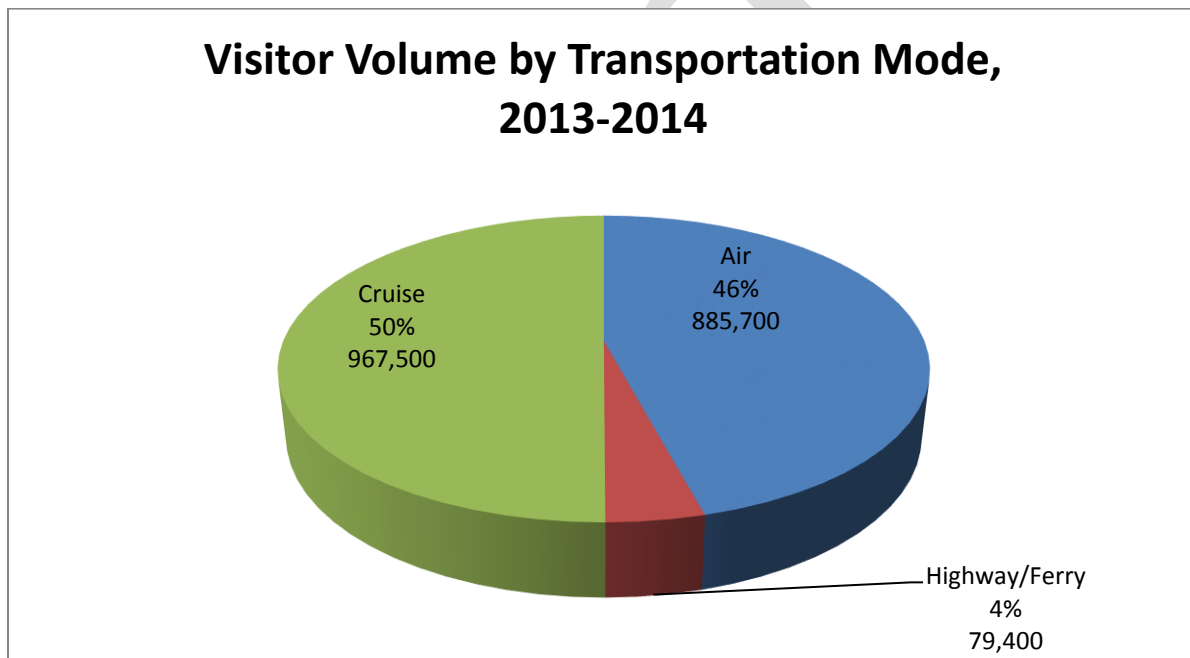
## Visitation/Seasonality

### Tourism

Visitation generates seasonal demand for transportation—since Alaska is a popular destination (particularly in the summertime) and draws visitors from around the nation and the world. The tourism industry continues to have a strong impact on the state's economy—resulting in revenue of more than \$1.8 billion annually (from direct visitor spending).<sup>11</sup> The tourism industry is comprised of cruise lines, air service, and highway/ferry traffic to Alaska, as well as thousands of businesses that provide services to tourists, including restaurants, hotels, recreation, and others.

Between October 2013 and September 2014, 1.9 million out-of-state visitors traveled to Alaska (Exhibit 31). About half of all visitors arrived by cruise, 46 percent arrived by air, and 4 percent of visitors arrived by highway/ferry.

Exhibit 31: Alaska Statewide Annual Visitors by Cruise Ship and Air, 2013-2014



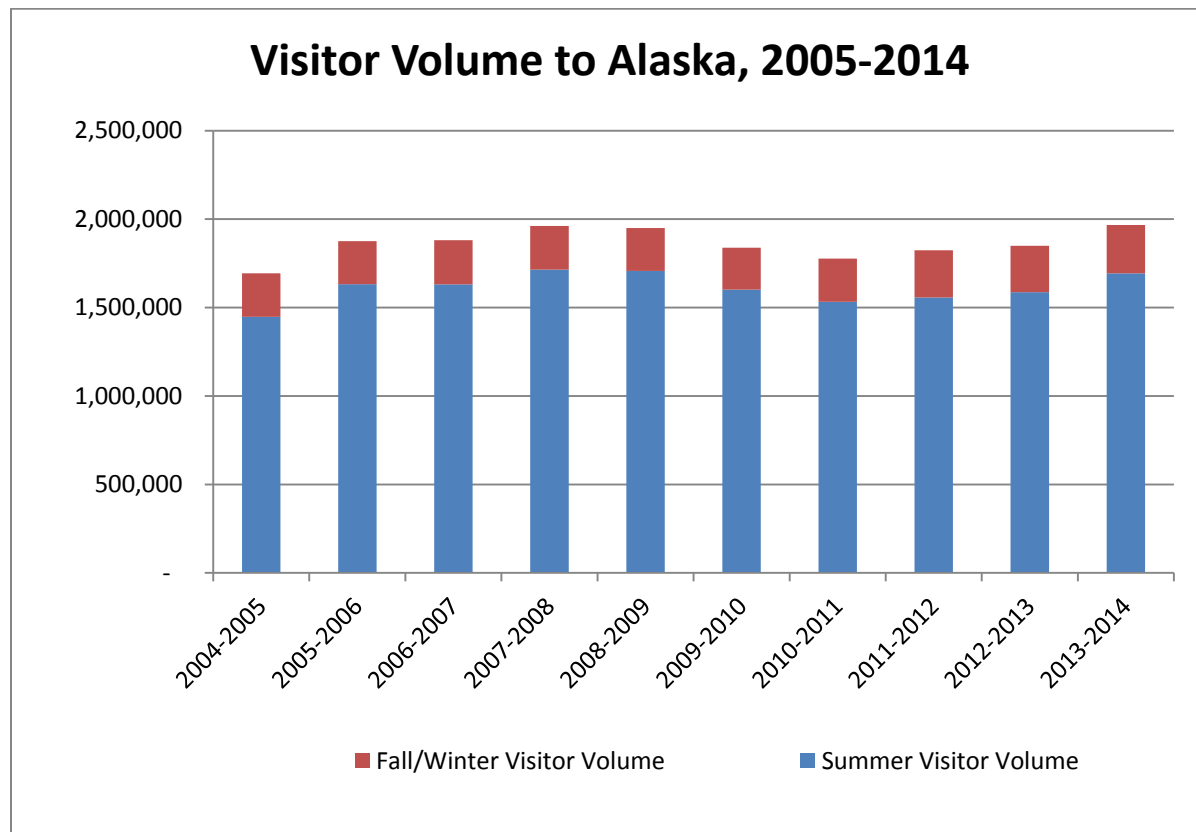
Source: *Economic Impact of Alaska's Visitor Industry, 2013-14*

There were 1.97 million visitors during the 2013 to 2014 season—which includes 1.69 million summer visitors and 273,000 fall/winter visitors. This is the highest number of visitors in the state's history—exceeding the previous peak in 2007 to 2008 by over 5,000 visitors—and the most growth from the

<sup>11</sup> <http://www.akrdc.org/tourism#sources>

previous year (6 percent) since 2005 to 2006. Although there was a slight decline in visitors from 2009 to 2011, there has been a steady increase between 2011 and 2014 (Exhibit 32).

Exhibit 32: Alaska Statewide Visitors by Season (Fall/Winter and Summer) from 2005 to 2014

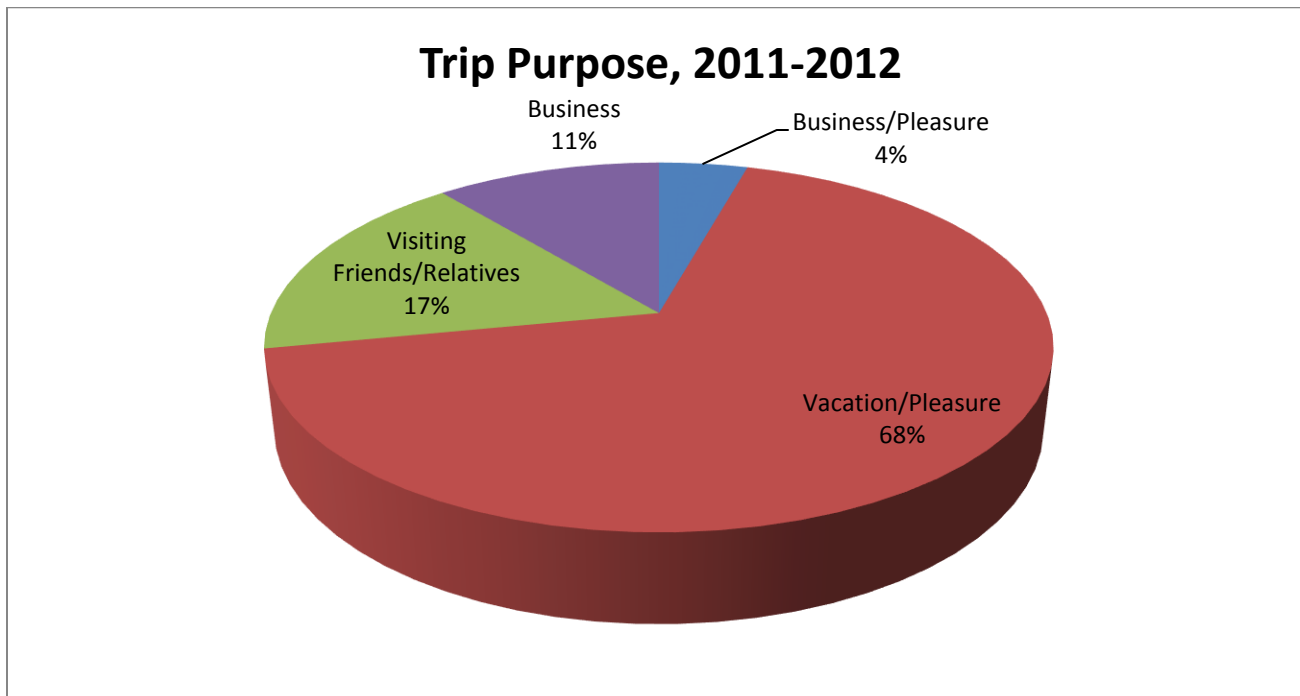


Source: Alaska Visitor Statistics Program VI Interim Visitor Volume Report, Fall/Winter 2013-2014, [https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2013\\_2014/AVSP%20VI%20Fall%20Winter%202013\\_14%20FINAL.pdf](https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2013_2014/AVSP%20VI%20Fall%20Winter%202013_14%20FINAL.pdf)

Between 2011 and 2012, most visitors traveled to Alaska for vacation/pleasure (68 percent); the second most common reason was to visit friends/relatives (17 percent), followed by business (11 percent), and business/pleasure (4 percent). Trip purpose varies by season—while the purpose of 77 percent of summertime visitors was vacation/pleasure, only 13 percent of fall/winter visitors came to Alaska for vacation/pleasure.

Exhibit 33 illustrates trip purpose for the 2011-2012 travel season.

Exhibit 33: Visitation to Alaska by Trip Purpose, 2011-2012



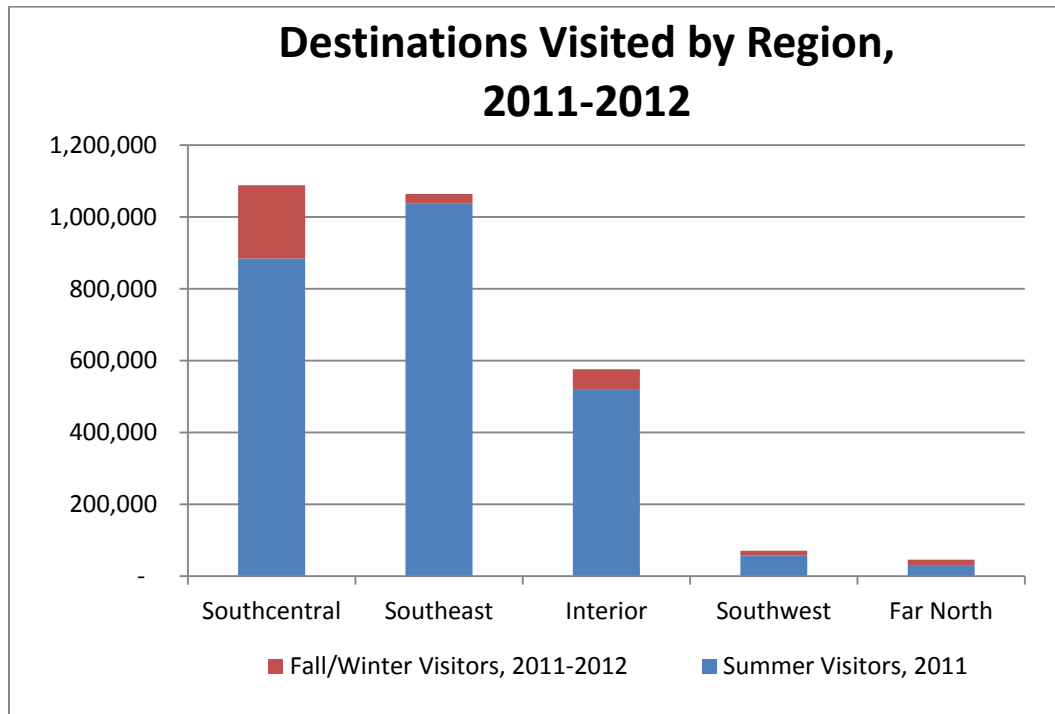
Source:

[https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/FW2011\\_12FinalFullDocument.pdf](https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/FW2011_12FinalFullDocument.pdf) and <https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/Summer/02%202011AVSP-FullReport.pdf>

The Southeast region was the most visited region by summer travelers (Exhibit 34); Juneau was the most visited destination, followed by Ketchikan, then Anchorage and Skagway. Two national parks, Denali and Glacier Bay, attracted about a quarter of visitors each, and seven of the top 10 destinations are cruise ship ports (Exhibit 35). The Southcentral region was the most visited region by fall/winter travelers (Exhibit 34); Anchorage was the most visited destination in fall/winter, followed by Fairbanks, and then Palmer/Wasilla (Exhibit 36).

Visitors tend to travel more widely throughout the state in the summertime—there is a greater distribution of visitors across the state’s different regions in the summertime than there is during the fall/winter.

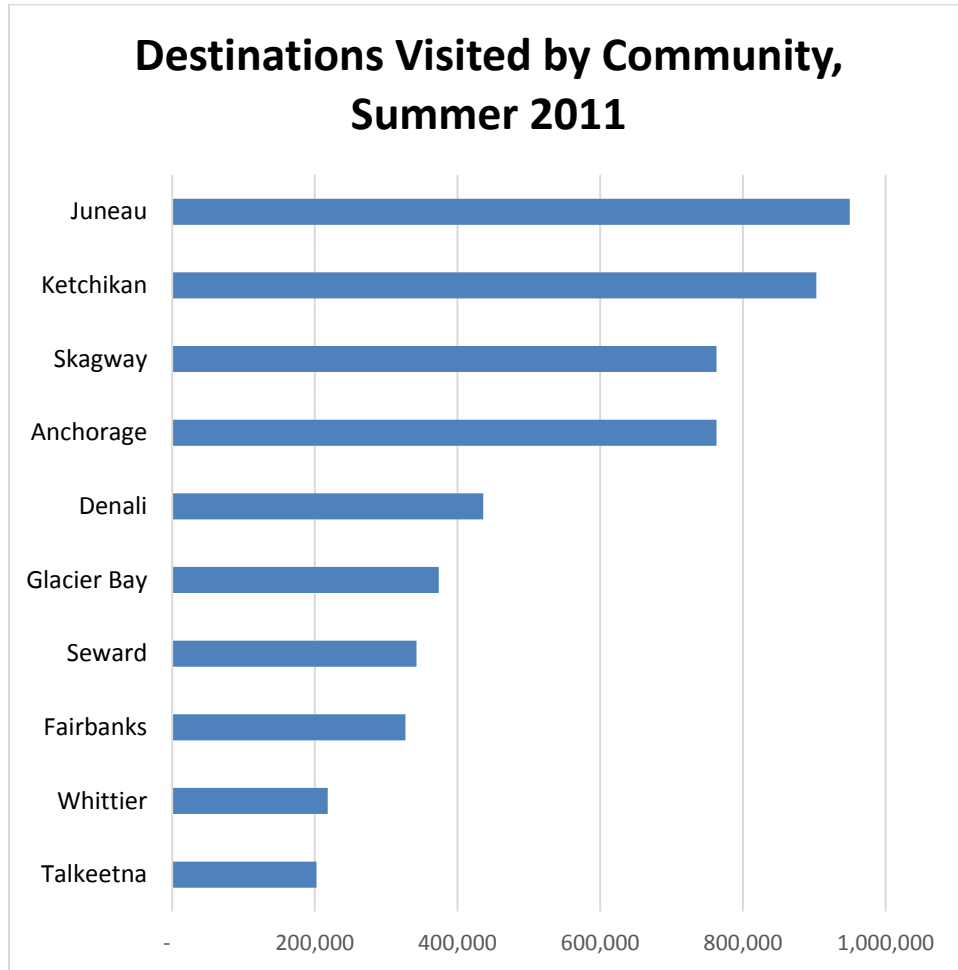
Exhibit 34: Top Tourist Destinations in Alaska by Region, 2011-2012



Source:

<https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/Summer/04%202011AVSP-ExecutiveSummary.pdf>

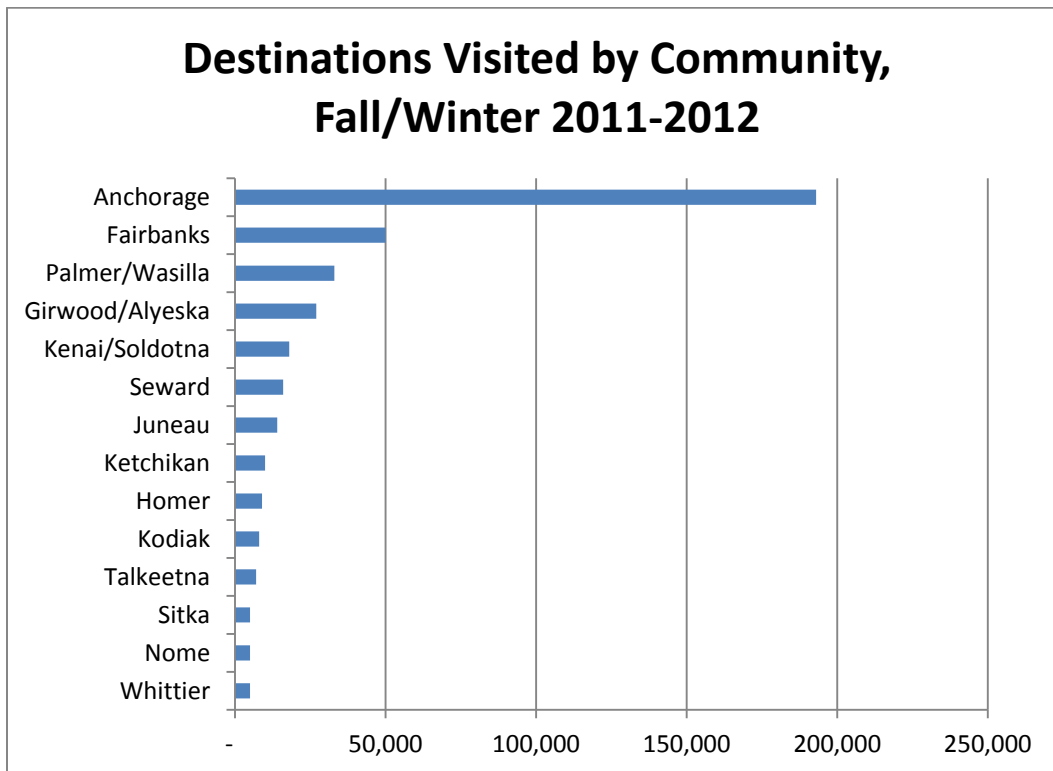
Exhibit 35: Top Tourist Destinations in Alaska by Community, Summer 2011



Source:

<https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/Summer/04%202011AVSP-ExecutiveSummary.pdf>

Exhibit 36: Top Tourist Destinations in Alaska by Community, Fall/Winter 2011-2012



Source:

<https://www.commerce.alaska.gov/web/Portals/6/pub/TourismResearch/AVSP/2011and2012/Summer/04%202011AVSP-ExecutiveSummary.pdf>

### Transportation Infrastructure Seasonality

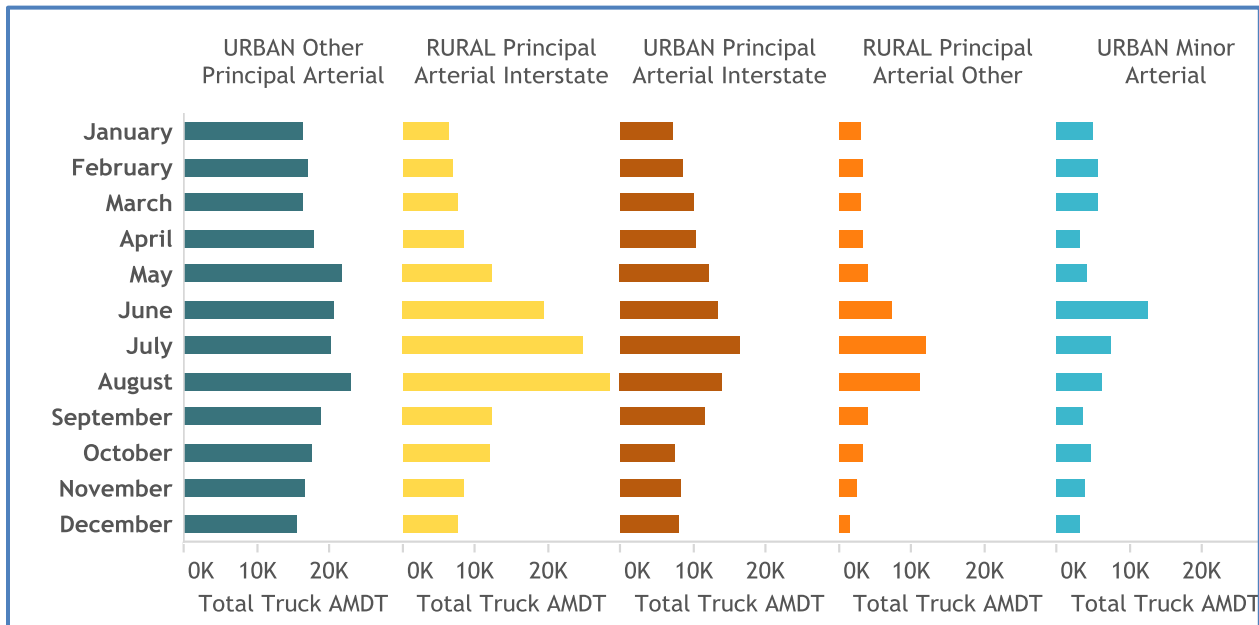
The availability of key transportation infrastructure to meet the demand for freight transportation in Alaska is variable depending on the season:

- **Ports and Rivers.** During warmer months, coastal and river communities can be reached by barge shipments of fuel and other heavy bulk commodities. However, during colder months, when ports and rivers freeze, these communities may be reachable only by air.
- **Trucking activity** in Alaska depends partly on demand and partly on the availability of roads. During the spring (April to June), the weight of trucks passing through certain road segments must be restricted since the thawing process during this time of the year leads the subgrade to be vulnerable to heavy loads, reducing the life of the road. Truck weight is usually restricted by 75 to 85 percent. The Dalton Highway was reconstructed to minimize the type of weight restrictions required. However, some remote communities and industrial production sites are reachable only in colder months, when ice roads can be constructed across tundra and frozen waterways. Exhibit 37 reports the average monthly truck trips by different road classifications for the Central Region.

- **Urban roads** have the least seasonal fluctuations. Demand is largely driven by the needs of urban populations and movements to and from major gateway facilities, and where roads in good condition are typically available all year.
- **Rural roads** have significant seasonal fluctuations, where demand is largely driven by industrial production with seasonal peaking characteristics.

The demand for freight transportation is driven by the amount and type of economic activity and is served by multiple transportation modes—including road, air, water, rail, and pipeline. These modes accommodate services that represent the supply of freight transportation capacity to meet demand.

Exhibit 37: Seasonality of Trucking in the Central Region, 2010 through 2012



Source: Analysis of Alaska DOT&PF.

## Travel Demand

### Existing Infrastructure

Alaska has four main highways, as shown in Exhibit 38:

- A-1 is 408 miles long and connects Anchorage to the Canadian Border (Glenn Highway/Tok Cutoff Road/Alaska Highway). This road continues through Canada until reaching the Continental U.S. in the state of Washington.
- A-2 is 202 miles long and connects Fairbanks to the A-1 at Tok (Richardson Highway/Alaska Highway).

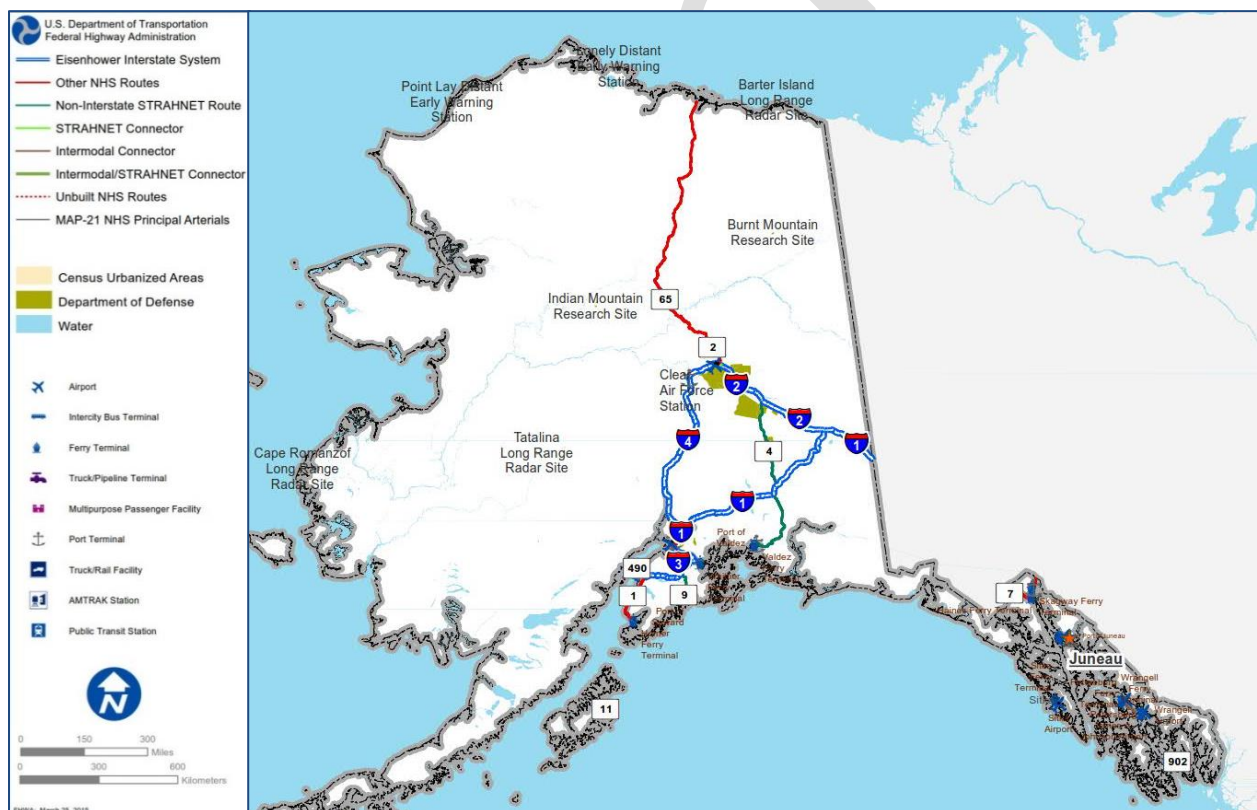


- A-3 is 148 miles long and connects Anchorage to the Kenai Peninsula eventually reaching the port town of Homer (Seward Highway/Sterling Highway).
- A-4 connects Anchorage to Fairbanks, the second largest city in the state (best known as Parks Highway).

There are six other highways that are as important and in some cases carry comparable traffic volume:

- The **Dalton Highway** goes from Fairbanks to the Arctic Ocean, spanning 414 miles (represented by a red line in Exhibit 38).
- The **Richardson Highway** is 368 miles long and connects Fairbanks to the Port of Valdez (dark green on the map).
- The **Seward Highway** connects the port town of Seward (light green on map) to Anchorage, intersecting the **Sterling Highway** after 37 miles.
- The **Steese Highway** is 161 miles long, and connects Fairbanks to Circle, which is about 50 miles from the Arctic Circle.
- The **Elliott Highway** is 152 miles, and extends from Fox to Manley Hot Springs.

Exhibit 38: Alaska Statewide Main Highway System, 2015



Source: [http://www.dot.alaska.gov/stwdplng/transdata/pub/NHS\\_map\\_Alaska.pdf](http://www.dot.alaska.gov/stwdplng/transdata/pub/NHS_map_Alaska.pdf)

Exhibit 39 presents a breakdown of the state's highway system centerline miles by functional class. A majority of the state's highway mileage are located in rural areas while less than 10 percent are located in urban areas.

**Exhibit 39: Alaska Statewide Highway System Center Miles by Functional Class, 2013**

| Functional System              | Rural Centerline Miles (2013) | Urban Centerline Miles (2013) |
|--------------------------------|-------------------------------|-------------------------------|
| Interstate                     | 1,024                         | 57                            |
| Other Freeways and Expressways | -                             | -                             |
| Other Principal Arterial       | 808                           | 114                           |
| Minor Arterial                 | 452                           | 130                           |
| Major Collector                | 1,415                         | 125                           |
| Minor Collector                | 762                           | 64                            |
| Local                          | 595                           | 44                            |
| <b>Total</b>                   | <b>5,057</b>                  | <b>534</b>                    |

Source: FHWA Highway Statistics, 1993 and 2013

The state of Alaska has just over 15,500 lane miles. Out of the 15,500 lane miles, approximately 11,500 lane miles are paved. Exhibit 40 presents the paved road mileage of each region (Northern, Central, and Southeast) as well as the state's total unpaved road mileage for the current and previous models.

Compared to the data presented in *Let's Get Moving 2030*, paved lane mileage across each region and the state increased by about 1 percent each year since 2009. The Northern region continues to have the greatest number of lane miles, while the Southeast region has the fewest miles.

**Exhibit 40: Highway System Lane Miles by DOT&PF Region, 2009 vs. 2015**

|                                     | Lane Miles, Previous Model (2009) | Lane Miles, Updated Model (Current) |
|-------------------------------------|-----------------------------------|-------------------------------------|
| Northern (Paved)                    | 5,228                             | 5,613                               |
| Central (Paved)                     | 4,236                             | 4,448                               |
| Southeast (Paved)                   | 1,328                             | 1,419                               |
| <b>State Total (Paved)</b>          | <b>10,758</b>                     | <b>11,480</b>                       |
| <b>State Total (Unpaved)</b>        | <b>4,063</b>                      | <b>4,063</b>                        |
| <b>State Total (Paved, Unpaved)</b> | <b>14,821</b>                     | <b>15,543</b>                       |

Source: ADOT&PF Maintenance Department

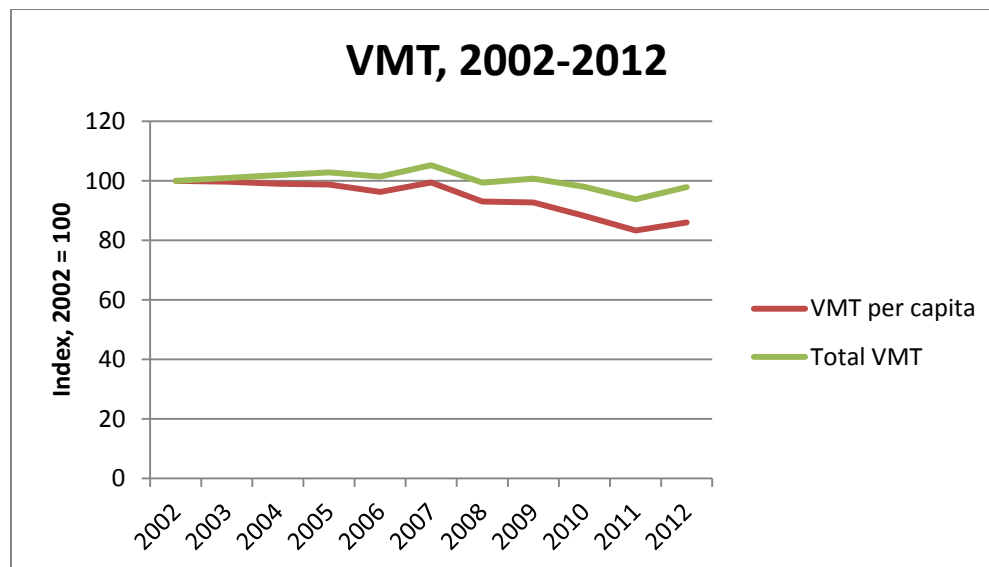
## Travel Demand Trends

### Vehicle Miles Traveled

- Between 2002 and 2012, VMT declined 2.12 percent (from 4.9 billion VMT to 4.79 billion VMT)
- VMT was the lowest in 2011, 4.59 billion VMT
- During the same timeframe, VMT per capita declined 14.01 percent

Exhibit 41 below illustrates the VMT per capita in Alaska between 2002 and 2012. Over the 10-year horizon, VMT per capita has decreased 14 percent. The state's decline in vehicle miles traveled despite a steady growth in population is consistent with the nationwide trend—vehicle miles traveled per-capita in the United States declined 7.4 percent from 2005 to 2012 (from 10,108 per-capita miles in 2005 to 9,361 miles per-capita in 2012). 46 states and the District of Columbia had a reduction in the average number of driving miles per person from 2005 to 2011, including Alaska.<sup>12</sup>

Exhibit 41: Alaska Statewide Vehicle Miles of Travel, 2002 to 2012



Source: State Transportation Statistics<sup>13</sup>

- At the regional level, vehicle miles traveled have also been on the decline—between 2003 and 2013, VMT declined 7.8 percent in Fairbanks, and 27.1 percent in Anchorage (Exhibit 42). These regions are Federal-Aid Urbanized Areas, which are areas with 50,000 or more persons that at a minimum, encompass the land area delineated as urbanized areas by the Bureau of Census.
- Exhibit 43 outlines the regional VMT for Fairbanks and Anchorage as a percentage of the statewide VMT for each year between 2003 and 2013:

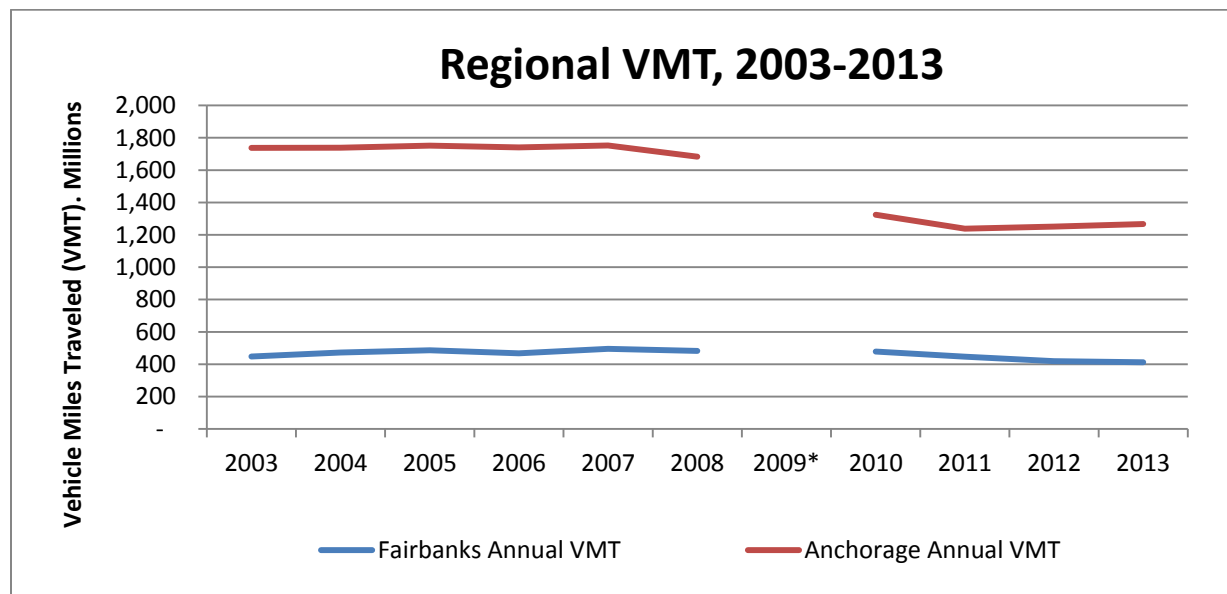
<sup>12</sup> Baxandall, P. (2013). *Moving Off the Road*. U.S. PIRG Education Fund.

<sup>13</sup> [http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/state\\_transportation\\_statistics/index.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/state_transportation_statistics/index.html)

- Fairbanks has stayed between 8 to 10 percent of the annual statewide VMT.
- Anchorage has ranged between 26 and 35 percent of the statewide VMT.

Plan  
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Exhibit 42: Travel Demand Trends by Region, 2003-2013



\*Data not available for 2009

Source: Highway Statistics Series, <https://www.fhwa.dot.gov/policyinformation/statistics.cfm>

Exhibit 43: Regional VMT as a Percentage of Statewide VMT

| Region    | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009* | 2010   | 2011   | 2012   | 2013   |
|-----------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|
| Fairbanks | 9.05%  | 9.47%  | 9.66%  | 9.42%  | 9.61%  | 9.86%  | --    | 9.98%  | 9.73%  | 8.77%  | 8.51%  |
| Anchorage | 35.16% | 34.84% | 34.80% | 35.03% | 34.01% | 34.39% | --    | 27.60% | 26.96% | 26.17% | 26.13% |

\*Data not available for 2009

Source: Highway Statistics Series, <https://www.fhwa.dot.gov/policyinformation/statistics.cfm>

The frequency of how much residents drive differs among regions—people tend to drive more or less depending on how urban or rural the state is.<sup>14</sup> Urban areas are more compact and driving may be less necessary than in low density areas where development tends to be more spread out, increasing the distances people need to drive to get to and from their destinations.

Whether or not the downward trend of vehicle miles traveled will persist remains uncertain. However, many of the factors that had previously contributed to the increase in driving are now reaching their peak, including the baby boom, large-scale highway construction, and the increase in household income and automobile ownership.<sup>15</sup>

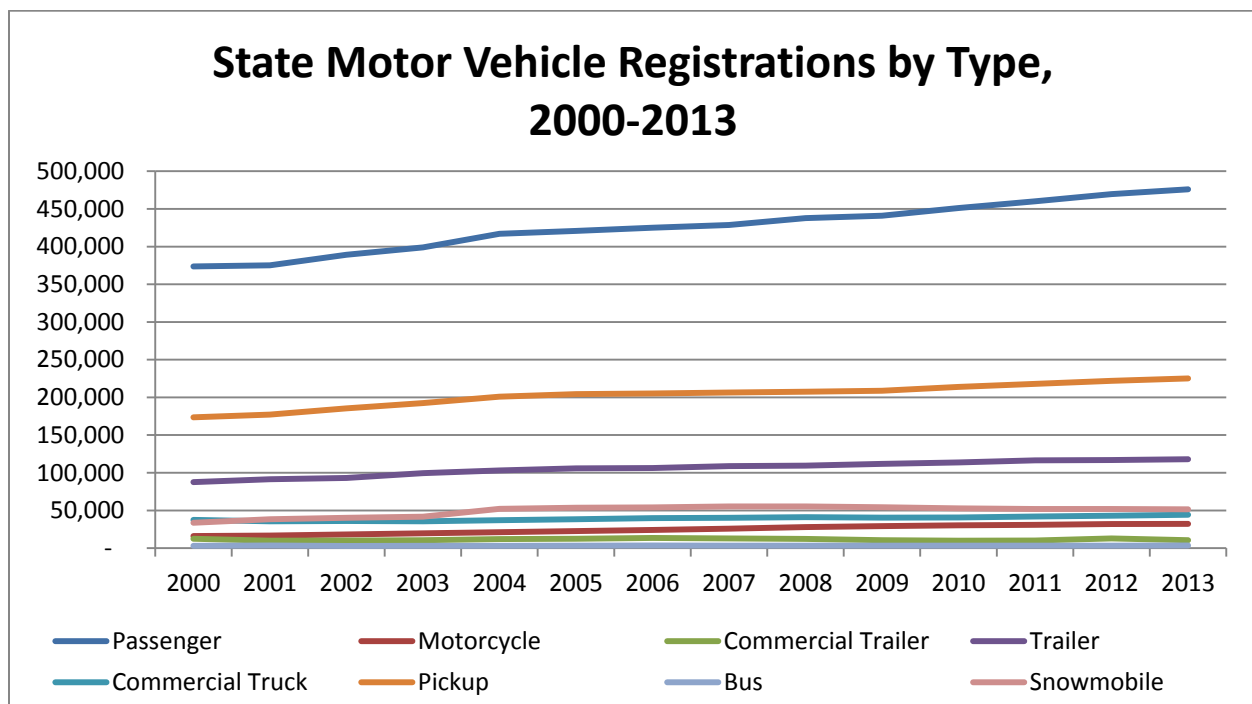
<sup>14</sup> Baxandall, P. (2013). *Moving Off the Road*. U.S. PIRG Education Fund.

<sup>15</sup> McCahill, C., & Spahr, C. (2013). *VMT Inflection Point: Factors Affecting 21st Century Travel*. State Smart Transportation Initiative.

### Motor Vehicle Registrations

- Although the population has steadily increased over the last 10 years, the number of state motor vehicle registrations for all vehicles in the state has risen by 23.5 percent between 2000 and 2013 (Exhibit 44).
- Interestingly, while registrations for automobiles decreased between 2001 and 2011 by nearly 27,000, the number of registered trucks and buses rose from 356,441 in 2001 to 511,246 in 2011.<sup>16</sup>
- Even though the number of registered vehicles increased at a rate greater than the increase in population, total vehicle miles traveled (VMT) per year has *decreased* by 2.7 percent.

Exhibit 44: Number of Statewide Vehicles by Type Registered in Alaska, 2000-2013<sup>17</sup>



Source: Alaska Division of Motor Vehicles: <http://doa.alaska.gov/dmv/research/research.htm>

Exhibit 45 compares state-motor vehicle registrations for automobiles and trucks, annual vehicle miles traveled, and population.<sup>18</sup>

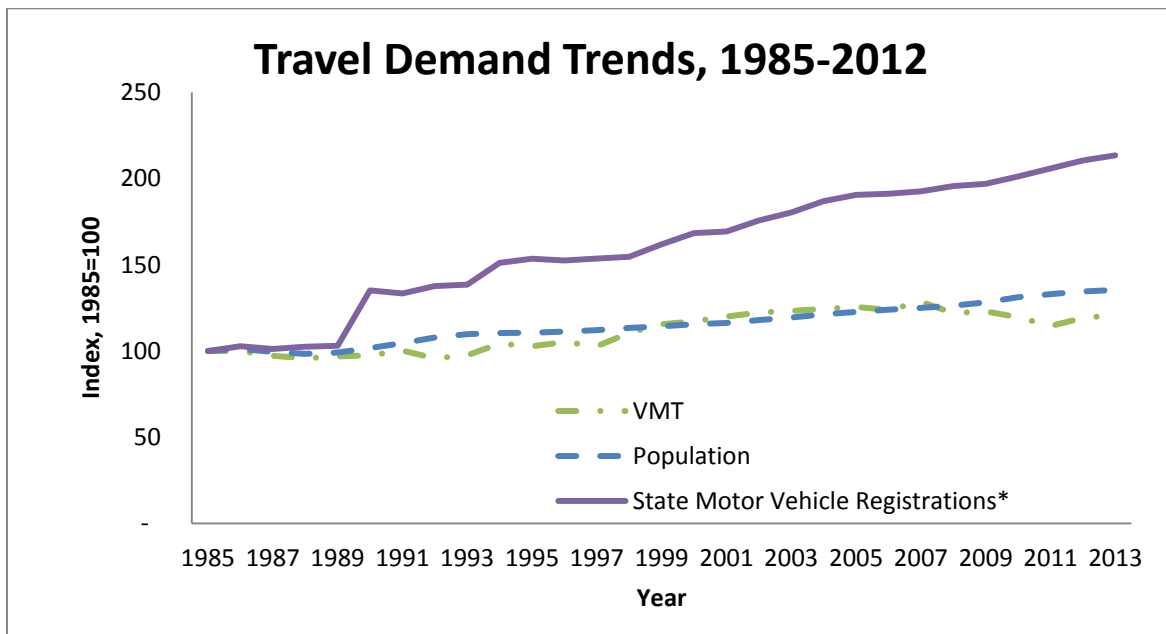
<sup>16</sup> FHWA Highway Statistics Series

<sup>17</sup> Some areas of the State do not require vehicle registration and are therefore not included in this graphic.

<sup>18</sup> Alaska DOT & PF Highway Performance Monitoring System (HPMS) for VMT, Alaska Department of Labor and Workforce Development, Research and Analysis Section for Population, and FHWA Highway Statistics for Registered Vehicles

- Population and state motor vehicle registrations have steadily increased since 1985, while vehicle miles traveled has declined in the past 5 years.
- The annual vehicle miles traveled decreased by 4.3 percent between 2010 and 2011.
- Since the population continues to increase but the VMT has experienced a recent decline, this may indicate that people are either traveling less or traveling on alternative modes such as transit. Although the VMT increased slightly between 2011 and 2013 (5.6 percent), the rate of increase is still lower than the pace of population growth.

Exhibit 45: Alaska Statewide Travel Demand Trends (VMT, Population, Vehicle Registrations), 1985 to 2012



\*Includes automobiles, buses, trucks; excludes motorcycles, trailers, and snow mobiles

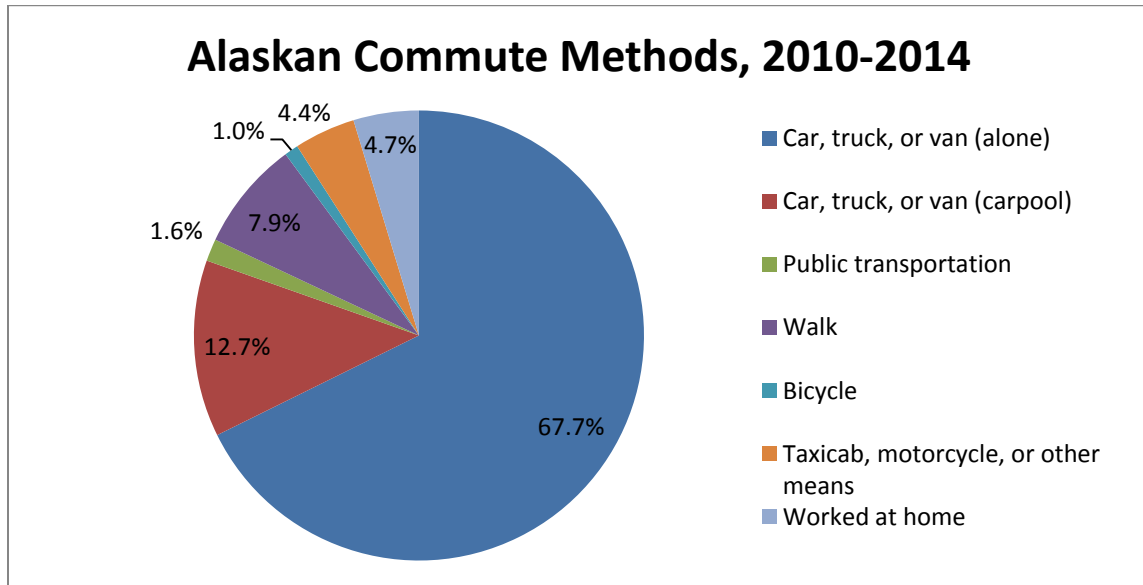
Sources: Alaska DOT & PF Highway Performance Monitoring System (HPMS) for VMT, Alaska Department of Labor and Workforce Development, Research and Analysis Section for Population, and FHWA Highway Statistics for Registered Vehicles, BEA for Real GDP

### Commuting Methods

The primary commute mode for Alaskans is driving alone via car, truck, or van (67.7 percent), while 12.7 percent of Alaskans carpool. Aside from driving, 7.9 percent walk to work, 1.6 percent of commuters use public transportation, and 1.0 percent bike (Exhibit 46).



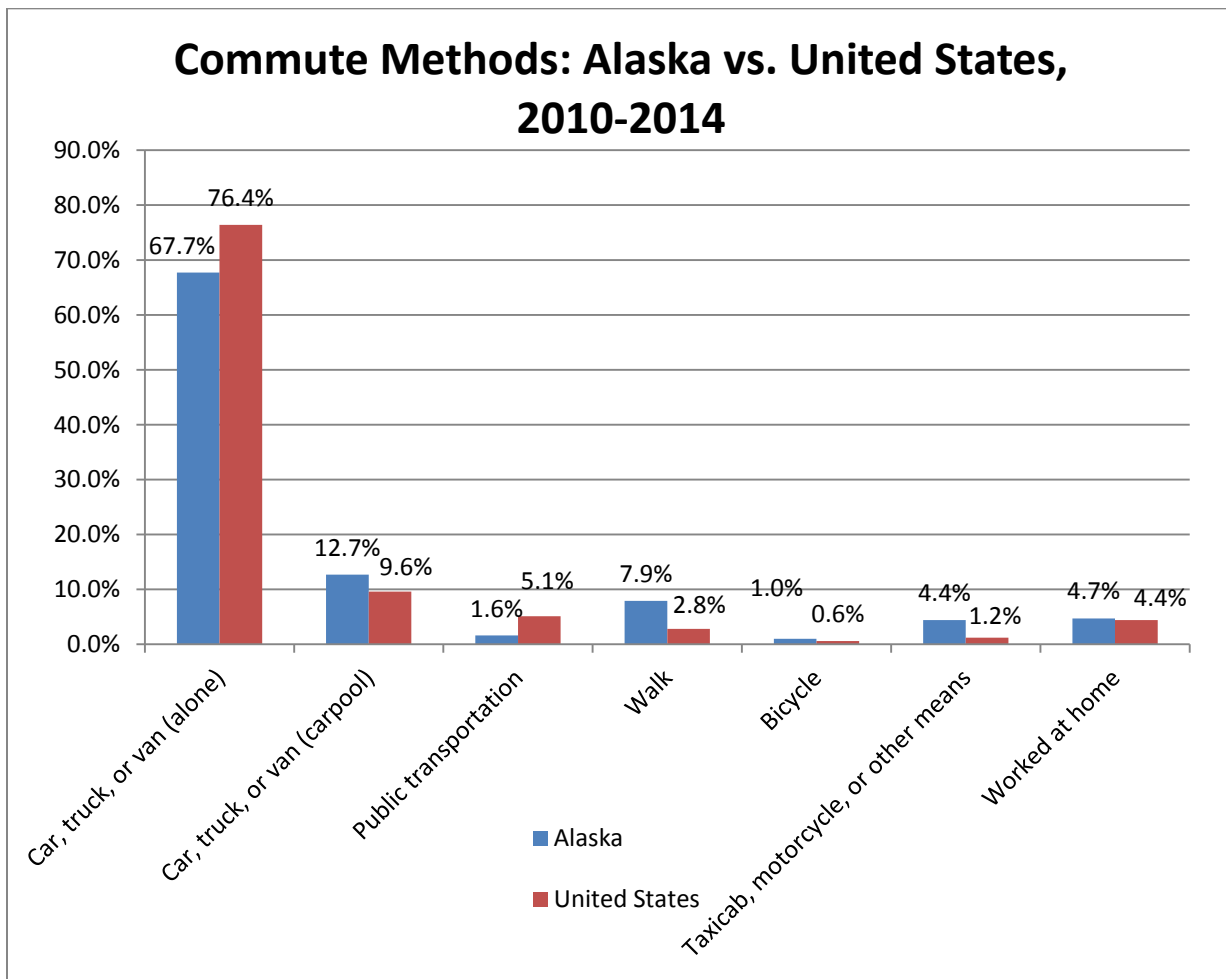
Exhibit 46: Alaskan Commuters by Transportation Mode, 2010-2014



Source: U.S. Census Bureau, American Community Survey, 2010-2014

Exhibit 47 compares commute modes in Alaska to those of the United States (all 50 states). This comparison, however, should take into account Alaska's smaller population, the geographic distribution of the population, and its unique geography. While more Americans drive to work alone than Alaskans, more Alaskans carpool to work than the nation as a whole. More Alaskans also commute via carpool, walk, and bicycle than the national percentage, this is attributed mainly to the high concentration of people living in smaller towns.

Exhibit 47: Comparison of Alaskan and U.S. Commuters by Transportation Mode, 2010-2014



Source: U.S. Census Bureau, American Community Survey, 2009-2014

## Future Travel Demand

Future travel demand trends were identified through the *2035 Metropolitan Transportation Plan for Anchorage Bowl and Chugiak-Eagle River* and *Fairbanks Metro 2040*:

- In 2035, the Anchorage metropolitan area will have 560,000 more daily trips than in 2007 (a 44 percent increase). Travel growth will put more stress on the transportation system and create capacity deficiencies in the road network. Daily travel within the metropolitan area will continue to grow because of steady growth in the Anchorage metropolitan area and Mat-Su Valley. Daily vehicle miles traveled are also anticipated to increase, which is attributed not only to more trips, but also to a larger share of trips that are forecast to travel longer distances from suburban locations to places of employment.<sup>19</sup>
- Traffic volumes in Fairbanks are generally expected to grow at annual rates under 2 percent per year, and in most instances, under 1 percent per year. Future capacity needs in Fairbanks are identified on specific roadways based on their forecast future volume-to-capacity ratio. DOT&PF maintains an operational standard of V/C less than 0.90 for its roadways. Segments with a future V/C of 0.90 or higher (according to travel demand model constructed for the FMATS region) are located on Richardson Highway, College Road, Peger Road, Cushman Street, Steese Expressway, and Johansen Expressway (see *Fairbanks Metro 2040* for specific segments). Segments where V/C is forecasted to be over 1.2 (which indicates significant congestion) are all located on Steese Highway.<sup>20</sup>

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<sup>19</sup> [http://www.muni.org/Departments/OCPD/Planning/AMATS/2036%20MTP/AMATS%20Chapter-5\\_20120511\\_s.pdf](http://www.muni.org/Departments/OCPD/Planning/AMATS/2036%20MTP/AMATS%20Chapter-5_20120511_s.pdf)

<sup>20</sup> <http://fmats.us/wp-content/uploads/2012/08/FMATS-2040-MTP.pdf>

## Freight

Freight movement was essential to Alaska's initial development and remains critically important today. Over 90 percent of discretionary revenues collected by the State come from petroleum production, and high percentages of the State's workforce and wages are directly linked to freight-dependent industries. Mining and fishing are key industries that provide employment for many Alaskans. Alaska has large quantities of petroleum, zinc, coal, copper gold, rare earth metals, and other valuable commodities that are in high demand around the world. Almost all of these products are exported to other states and countries. Alaska produces few of the consumer goods its workforce and population require, so these goods must be imported from other states and countries.

As a result, Alaska's overall economy and quality of life depend on freight transportation "supply chains" that span the State, nation, and world.

- Alaska's size and geography pose unique challenges for the freight transportation system. Much of Alaska's freight is generated by remote resource extraction industries that require long-distance transportation and service corridors, like the Dalton Highway and the Trans-Alaska Pipeline System. Most of the population lives in Anchorage, Fairbanks, and Juneau; these cities attract the bulk of consumer goods that come into the state and are connected by major seaport and airport infrastructure. Anchorage and Fairbanks also serve as hubs for rail and truck transportation.
- There are also hundreds of smaller cities and communities located throughout Alaska's vast geography. Many of these communities are not connected to the road network, and require basic goods like food and fuel to be brought in long distances by air or barge. The Essential Air Service Program and Bypass Mail Program provide important support for ensuring continued flow of goods to these communities by passing some of the costs of these services on to other users/taxpayers. In spite of the programs, the costs associated with importing and distributing basic consumer goods results in consumer prices that are far above national averages, especially in Alaska's remote areas.
- To serve its industries and population, the state has invested heavily in its freight transportation infrastructure. The state has large seaports that handle containerized inbound cargo at Anchorage and other locations, and seaports with specialized facilities to handle bulk commodities at Valdez, Nikiski, Seward, and elsewhere. It has two main international airports that serve as hubs for goods to reach remote airports and airstrips throughout the state, and many smaller airports serving other communities. Highways connect the main cities, while smaller and seasonal ice roads allow vehicles and trucks to wind inward towards the interior as the geography and climate permit. Freight rail and pipelines provide services in critical corridors. In the lower 48 states, "last mile" connections usually refer to trucks; in Alaska off the road and rail systems, these connections are sometimes made by snowmobiles and/or ATVs. Alaska's freight transportation is truly multi-modal.

- In Alaska, the relationship between commodity prices, resource development, and freight transportation infrastructure is especially close. Much of Alaska's freight movement is driven by private-sector resource development, especially petroleum and natural gas. The ongoing decline of North Slope oil production has been recognized as a source of uncertainty (for transportation demand) and risk (for State revenues), but with the recent dramatic declines in global energy prices, uncertainty and risk issues are elevated. How extensive will future private-sector resource development be, and where, and when? What transportation improvements will be required to serve it? How fast will Alaska's workforce and population grow (and where), given that a large share of that workforce is supported directly and indirectly by resource industries? What are the likely impacts and opportunities associated with climate change and variability, and other global / external factors? How much funding will be available for the transportation system improvements that Alaska's communities and stakeholders may need or want, from public sources and from private owners and partners?

Against this backdrop, the ADOT&PF and its state, regional, and local partners face the challenge of managing the existing freight infrastructure and planning for its future needs. The *Freight Element of the LRTP* presents perspectives on what drives the market demand for freight transportation, how the market is served today, as well as trends impacting the future, and the role that government can play in meeting freight system needs. The Freight Element is intended to support decisions about freight transportation policies, strategies, and actions, within the context of the state's LRTP.

### Existing Conditions/Trends

The demand for freight is driven by the quantity and type of economic activity. For example, freight intensive industries, non-freight industries, and the Government drive freight transportation. In 2013, 55% of Alaska's Gross State Product was from freight-intensive industries, while 28% was from other industries, with the remaining 17% from government (see Exhibit 48). At 29.5%, mining was the largest contributing industry followed by transportation and warehousing.

Exhibit 48: Alaska Gross State Product, 2013

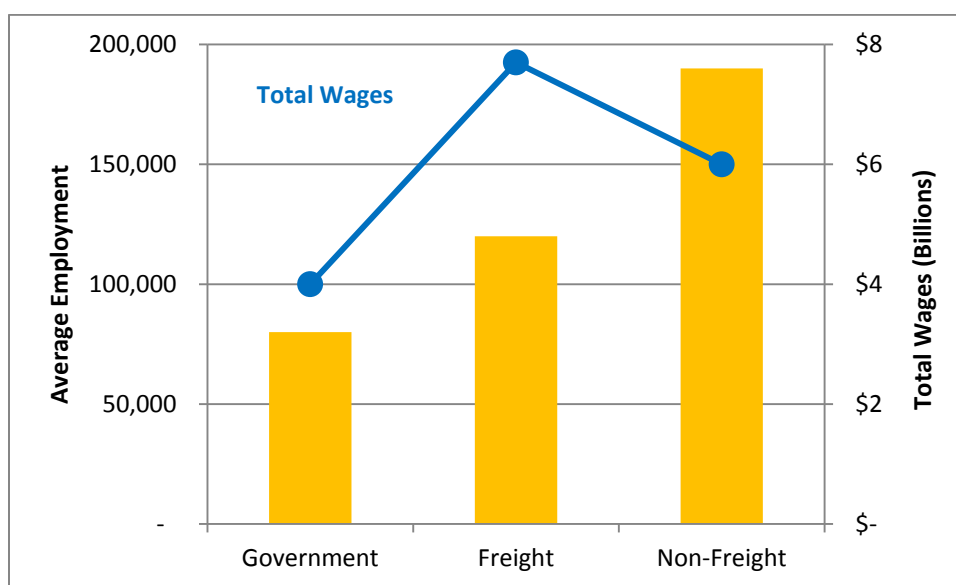
| Industry                                      | \$ Millions   | Share        |
|---|---------------|--------------|
| Mining  | 17,488        | 29.5%        |
| Transportation and Warehousing                | 6,479         | 10.9%        |
| Construction                                  | 2,367         | 4.0%         |
| Retail Trade                                  | 2,089         | 3.5%         |
| Manufacturing                                 | 1,753         | 3.0%         |
| Wholesale Trade                               | 1,219         | 2.1%         |
| Utilities                                     | 747           | 1.3%         |
| Agriculture, Forestry, Fishing, and Hunting   | 406           | 0.7%         |
| <b>Subtotal, Freight-Intensive Industries</b> | <b>32,548</b> | <b>54.8%</b> |

| Industry                          | \$ Millions   | Share        |
|-----------------------------------|---------------|--------------|
| <b>Subtotal, Other Industries</b> | <b>16,640</b> | <b>28.0%</b> |
| <b>Subtotal, Government</b>       | <b>10,617</b> | <b>17.1%</b> |
| <b>All Industry, Total</b>        | <b>59,335</b> | <b>100%</b>  |

Source: Analysis of U.S. Bureau of Economic Analysis Data

In 2013, freight intensive industries were directly responsible for 34% of the state’s full-time employment and 39% of the state’s wages from employment. On a per-employee basis, wages in freight industries were 40% higher than in non-freight intensive industries and 11% higher than in government (see Exhibit 49).

Exhibit 49: Employment and Wages by Major Industry Type, 2013



Source: Analysis of Alaska Department of Labor and Workforce Quarterly Census of Employment and Workforce (QCEW) data

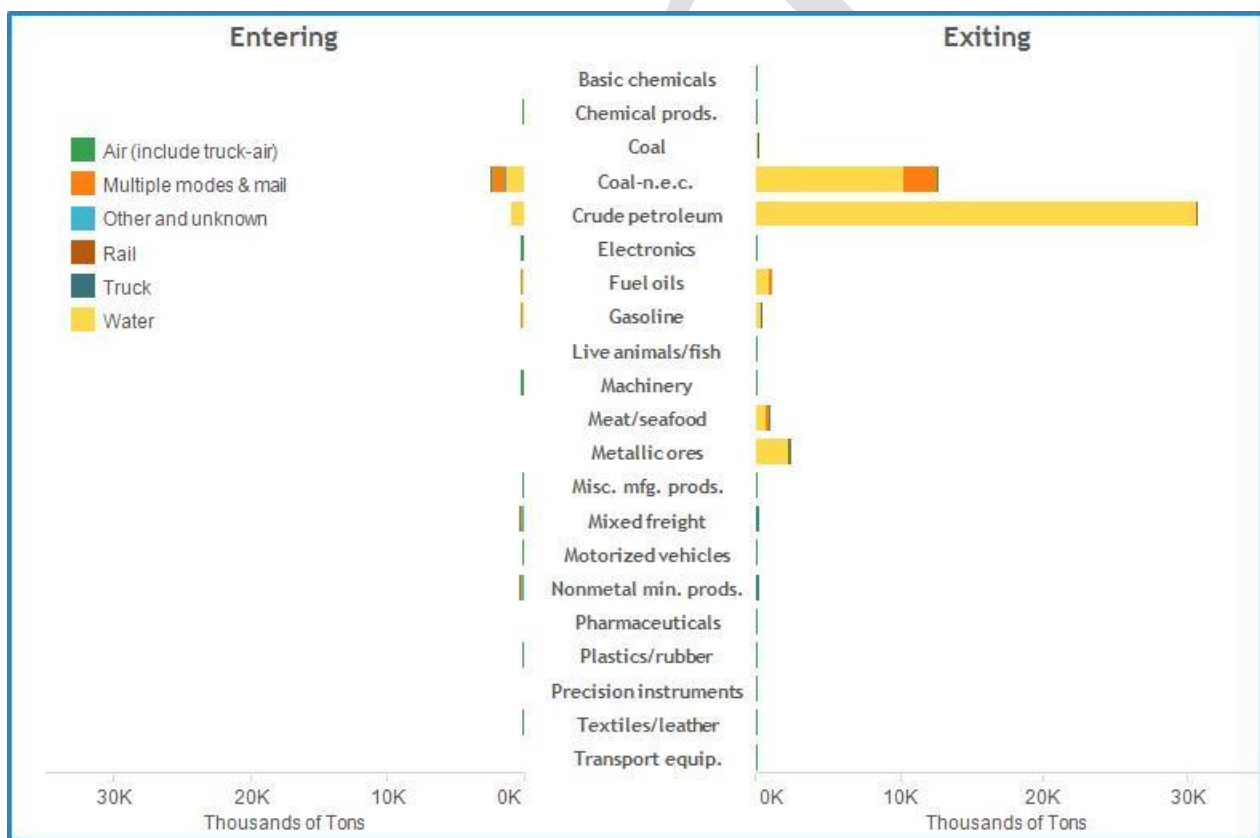
### Trade Imbalance and Dependence

Alaska is characterized by a dramatic imbalance between its produced and consumed commodities. For example, most of what Alaska produces is exported to other states and countries, while most of what Alaska consumes is provided by other states and countries. This imbalance creates an especially strong dependence on effective trading connections and services. In addition, freight entering the state is mostly composed of relatively valuable lower-weight consumer goods and industrial machinery and supplies, moved primarily by air. Freight exiting the state, on the other hand, is dominated by heavy lower-value bulk commodities, especially petroleum, moved primarily by water.

Exhibit 50 shows the estimated tonnage of freight entering and exiting Alaska in 2012. The largest tonnages are clearly exiting Alaska. Waterborne tonnage exiting Alaska is associated with crude petroleum and “coal n.e.c.” (or “not elsewhere classified”); with coal n.e.c. including coal and petroleum related products such as natural gas. Some coal n.e.c. is also moving by multiple modes, which in this case, is moved primarily rail and water. Metallic ores, meat and seafood, and fuel oils report significant exiting tonnage. On the entering side, only coal n.e.c. shows significant tonnage.

However, this relationship is very different from the perspective of commodity value. As shown in Exhibit 51, entering commodity values are much higher than exiting values. The leading commodities entering Alaska include electronics, machinery, miscellaneous manufactured products, mixed freight (usually the contents of international shipping containers), precision instruments, pharmaceuticals, and textiles. The vast majority of these goods are entering the state by air cargo, although some arrive as intermodal marine cargo. On the exiting side, crude petroleum and coal n.e.c. and meat/seafood move primarily by water while electronics, machinery, and precision instruments move primarily by air.

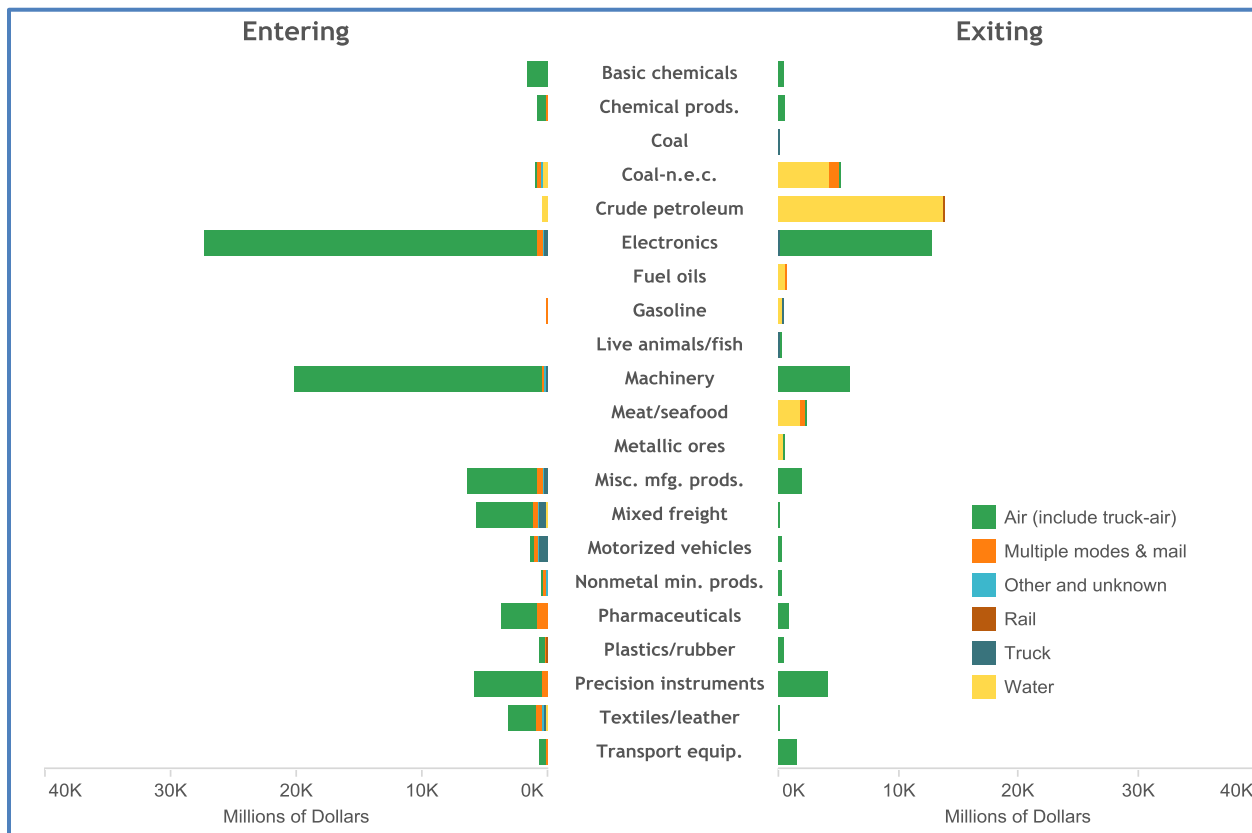
Exhibit 50: Alaska Domestic and International Trade Tonnage, Excluding Pass-Through, 2012



Source: WSP/PB Analysis of Freight Analysis Framework 3 data



Exhibit 51: Alaska Domestic and International Trade Value, Excluding Pass-Through, 2012



Source: WSP/PB Analysis of Freight Analysis Framework 3 data

For shipments exiting Alaska, the leading trade partners for tonnage include California and Washington (which receive crude petroleum for refining), while the leading trade partner for value is Eastern Asia. For shipments entering Alaska, the leading trade partners for tonnage are Eastern Asia, Washington, and Europe, while the leading trade partner for value is Eastern Asia.

### In-state Supply Chains

Alaska is a very large state with long supply chains. Freight exported from Alaska must be moved long distances, from extraction and production facilities to ports and airports. Freight imported must be distributed from a few gateway ports and airports to users distributed throughout the entire state. The resulting supply chains mean that each ton of freight has to move more miles to serve Alaska than any other state, leading to significantly higher freight costs for Alaska business and consumers. In 2012, the average truck trip length (miles per ton), was 194 miles for Alaska compared to 139 miles for Montana and 116 for Idaho. In-state flows are especially important because they encompass most of the demand that must be accommodated by Alaska’s highways, railroads, waterways, airways, and pipelines. Fuel oils, gasoline, petroleum, and coal account for the majority of tons moved internally within Alaska.

### *Pass-Through Traffic*

Alaska is in a unique geographic position, midway between the lower 48 states and Asia, serving as a gateway for pass-through air cargo. Alaska's freight infrastructure, and its economic activity related to pass-through freight, is therefore linked to larger global trade. Alaska is extensively used as a global gateway in supply chains that have origins and destinations outside of the state and U.S. This is due to Alaska being in a prime location for refueling international air cargo flights between the U.S. and Asia, which carry high value goods such as electronics, machinery, precision instruments, and pharmaceuticals. Almost all of these refueling stops take place at Ted Stevens Anchorage International Airport (ANC). Global package logistics companies such as UPS and FedEx have sorting and warehousing facilities near ANC. International air cargo is also handled at Fairbanks.

### *Modal Tonnage and Value*

Freight in Alaska is moved by truck, air, water, rail, and pipeline. These modes accommodate services that represent the supply of freight transportation capacity to meet demand. Each mode varies with respect to tonnage and value shares and the type of trade they accommodate, while each fills a critical niche in the overall multimodal transportation network in the state.

As shown in

Exhibit 52 and Exhibit 53, Alaska's freight transportation modes moved more than 120 million tons of freight, worth nearly \$454 billion (in 2012), including:

- 51.0% of tonnage moved within Alaska, while 41.0% exited, 5.6% entered, and 2.4% passed through the state.
- 45.1% of tonnage was moved by water, 26.7% by truck, 14.6% by pipeline, 4.3% by multiple modes and mail, 4.2% by rail, 3.0% by air, and 2.2% by other and unknown (assumed to be fly-away aircraft and delivery trucks).
- 18.0% of value was moved within Alaska, while 11.8% exited, 29.9% entered, and 40.4% passed through the state.

- 62.73% of value was moved by air, 22.6% by other and unknown (assumed to be fly-away aircraft and delivery trucks), 5.8% by water, 4.8% by truck, 1.9% by pipeline, 1.7% by multiple modes and mail, and 0.5% by rail.

Exhibit 52: Alaska Freight Tonnage by Mode (in Thousands of Tons), 2012

| Mode                             | Within<br>(51.0%) | Exiting<br>(41.0%) | Entering<br>(5.6%) | Through<br>(2.4%) | Total          |
|----------------------------------|-------------------|--------------------|--------------------|-------------------|----------------|
| Water (45.1%)                    | 4,859             | 45,515             | 3,256              | 493               | <b>54,123</b>  |
| Truck (26.7%)                    | 30,580            | 388                | 780                | 269               | <b>32,017</b>  |
| Pipeline (14.6%)                 | 17,535            | -                  | -                  | -                 | <b>17,535</b>  |
| Multiple modes and mail (4.3%)   | 281               | 2,950              | 1,888              | 7                 | <b>5,126</b>   |
| Rail (4.2%)                      | 4,972             | 93                 | 29                 | 1                 | <b>5,095</b>   |
| Air (including air-truck) (3.0%) | 426               | 324                | 720                | 2,164             | <b>3,634</b>   |
| Other and unknown (2.2%)         | 2,574             | 10                 | 11                 | 1                 | <b>2,596</b>   |
| <b>Total</b>                     | <b>61,227</b>     | <b>49,280</b>      | <b>6,684</b>       | <b>2,935</b>      | <b>120,126</b> |

Source: Analysis of Freight Analysis Framework 3 data

Exhibit 53: Alaska Freight Value by Mode (in Millions of Dollars), 2012

| Mode                              | Within<br>(18.0%) | Exiting<br>(11.8%) | Entering<br>(29.9%) | Through<br>(40.4%) | Total          |
|-----------------------------------|-------------------|--------------------|---------------------|--------------------|----------------|
| Air (including air-truck) (62.7%) | 848               | 30,262             | 71,393              | 182,263            | <b>284,766</b> |
| Other and unknown (22.6%)         | 102,274           | 54                 | 126                 | 131                | <b>102,585</b> |
| Water (5.8%)                      | 1,683             | 21,154             | 3,078               | 274                | <b>26,189</b>  |
| Truck (4.8%)                      | 3,593             | 470                | 17,759              | 67                 | <b>21,889</b>  |
| Pipeline (1.9%)                   | -                 | -                  | 8,726               | -                  | <b>8,726</b>   |
| Multiple modes and mail (1.7%)    | 4,957             | 1,406              | 821                 | 404                | <b>7,588</b>   |
| Rail (0.5%)                       | 19                | 25                 | 2,090               | 1                  | <b>2,135</b>   |
| <b>Total</b>                      | <b>81,771</b>     | <b>53,371</b>      | <b>135,596</b>      | <b>183,140</b>     | <b>453,878</b> |

Source: Analysis of Freight Analysis Framework 3 data

## Freight Carriers, Networks, and Facilities

### Trucking

Compared to other states, trucks in Alaska carry less tonnage and value than other modes primarily because 1) of lack of trucks passing through Alaska on their way to other states, and 2) Alaska's higher use/dependence on air and water modes. By tonnage, the primary commodities moved by truck include gravel, nonmetallic minerals, fish, waste/scrap, fuel oils, gasoline, and logs. By value, the primary commodities moved by truck include machinery (typically industrial), fish, gasoline, fuel oils, mixed freight (typically containerized or moving to/from warehouse/distribution facilities), motor vehicles and foodstuffs, along with a wide range of consumer and industrial products. Alaska's main highways are shown in Exhibit 38.

Exhibit 54 shows the leading truck corridors in Alaska based on location and functional classification, truck volumes, and truck percentages (share of total vehicle trips that area trucks).

Exhibit 54: Leading Alaska Truck Corridors

| Route                      | Estimated of Annual Average Daily Truck Traffic (Both Directions Combined) at Highest AADTT Segment | Estimated Truck Percentage (Share of Total AADT Associated With Trucks) at Highest Percentage Segment |
|----------------------------|---|---|
| Dalton Highway             | Over 100  | 82%   |
| Seward Highway             | Up to 3000  | 18%   |
| Parks Highway below Denali | Over 2000   | 22%   |
| Sterling Highway           | Nearly 2000   | 15%   |
| Steese Expressway          | Over 1400   | 14%   |
| Tongass Expressway         | Up to 1200  | 13%   |
| Parks Highway above Denali | Nearly 1000   | 21%   |
| Richardson Highway         | Over 700  | 28%   |

Source: Analysis of Alaska DOT&PF Annual Traffic Volume Reports.

The reports cover different years ranging between 2004 and 2012 depending on the region and route. Please refer to Appendix A for details.

### Air

Alaska has approximately 300 communities of which only about a third are connected to the roadway system. Other communities can only be accessed by water or air. Air cargo plays a very critical and

unusual role in distributing freight. The main air cargo commodities moving within Alaska are fuel oils and gasoline. These are heavy, low-value commodities that in the lower 48 states, rarely if ever move by air due to the high cost of air freight. Rural communities also rely on the United States Postal Service's Bypass Main Program, which delivers air freight at postal rates. In 2013, the program served 43 communities in Alaska, representing 27% of all communities supported by the program in the US. The largest cargo airports in Alaska are Ted Stevens Anchorage International Airport (ANC) and Fairbanks International Airport (FAI). Other airports handling over 10,000 tons of enplaned and deplaned mail and freight in 2013 included Bethel, Kotzebue, Nome, Deadhorse, Juneau, and Barrow. In Alaska, the primary air cargo by tonnage are electronics, machinery, miscellaneous manufactured products, and precision instruments.

### Marine

Marine transportation also plays an important role in freight movement in Alaska. The leading waterborne commodities by tonnage and value moved by marine include crude petroleum, coal n.e.c., seafood, and ores. These commodities primarily are moving outbound to other states or global markets. Alaska received inbound containerized goods from U.S. and foreign ports.

Water is also important because it supports the Alaska economy. In Southeast Alaska, approximately 26% of all employment income comes from marine-related trades including fishing, tourism, freight movement and related activities. In the Southwest, the seafood industry is the largest economic sector responsible for most private jobs. High volume ports (and their dominant freight activity) in Alaska include:

- Port of Valdez (crude petroleum exports)
- Port of Anchorage (import of consumer goods and petroleum)
- Port of Seward (export of coal lignite)
- Port of Nikiski (petroleum)
- Port of Kivalina (exports smelted products and non-ferrous ores and imports distillate fuel oils)
- Ports of Unalaska (exports seafood products and imports distillate fuel oils)

### Railroad

The Alaska Railroad Corporation (ARRC) transports both freight and people. The ARRC connects the Ports of Seward and Whittier to Fairbanks (passing through Anchorage). In Whittier, the ARRC connects with rail barges (barges with rail tracks allowing railcars to be rolled on and off) that continue to Seattle and Prince Rupert, British Columbia. At Seward, there are large freight facilities for loading cargo ships. In 2013, the top commodities moved by the ARRC included:

- Sand and gravel (2.0 million tons)
- Coal (1.4 million tons)
- Petroleum products (947,000 tons)
- Chemicals (155,000 tons)

- Intermodal (104,000 tons)

### Pipeline

Pipelines are a very efficient way to move large quantities over long distances. In Alaska, the best known pipeline is the Trans-Alaska pipeline which is operated by the Alyeska Pipeline Service Company. It links the Prudhoe Bay Oil Fields in northern Alaska to the Port of Valdez. It is one of the largest pipelines in the world, spanning 800 miles with a diameter of 48 inches. Oil shipments using this pipeline peaked in 1988 at 2 billion barrels a day, and have been declining since.

### *Seasonal Variation*

In Alaska, freight movement is highly seasonal, due to production and employment cycles, as well as changes in the availability of key infrastructure, especially roads and waterways.

### **Future Expected Conditions/Trends**

There is a high likelihood that the primary trends presented below experienced in recent years impacting freight will continue statewide into the future:

- **Population Growth will continue to Drive Increased Consumption.** Alaska's population is expected to grow and to increasingly concentrate in larger urban areas. This will result in a higher demand for consumer goods including more freight tonnage and truck movement.
- **Overall Growth in Freight-Intensive Industries.** Alaska's overall economy and its freight-intensive industries will continue to expand, creating increased demand of inbound, outbound, and within-state goods movement. This will create increased freight volumes by all modes, in both urban (e.g., location of key gateway and logistics facilities) and in rural areas (e.g., location of resource extraction and other freight activities).
- **Changes in Resource Development Industries.** Future levels and economic growth related to energy and other resource production will continue to have significant impact on the state's freight transportation network, and with freight demand in particular. For example, if energy production slows significantly, the flow of resource commodities within and outbound from Alaska could slow down significantly, but also reduce in-migration and population growth (historically, large swings in Alaska's population have been associated with resource development), with the additional effect of flattening demand for inbound consumer goods. If, on the other hand, resource production increases rapidly, the rapid development of new transportation capacity – pipelines, ports, etc. may be needed-- not only to handle increasing volumes of resource commodities, but also to meet the consumer needs of a rapidly-expanding workforce.

The future outlook for Alaska's key resource development industries are expected to include:

- **Oil.** Oil has been Alaska's most important commodity. Oil production in Alaska has been declining since the 1980s and these declines are expected to continue through 2023. There is potential for new oil production in the future due to recent increased exploration efforts on the North Slope. There is interest in conducting oil exploration activity in other parts of Alaska such as Central Region and near the Bering Sea.
- **Natural Gas.** Natural gas in Alaska is primarily used to meet local electricity and heating needs. The State has large natural gas deposits. There is considerable interest in developing projects that will allow access to these deposits, especially on the North Slope, and allow Alaska to resume its natural gas exports.
- **Mineral Production.** Significant deposits of zinc, gold, silver, coal, and other valuable resources are distributed throughout the state. Often, high transportation costs and environmental effects have made the extraction of these valuable resources unfeasible; but in cases where these challenges could be overcome, mineral extraction has been a significant contributor to the state's economy. Most of Alaska's mineral production comes from Usibelli (coal), Red Dog (zinc and lead), Fort Knox (gold), Nixon Fork (gold), Pogo (gold), Greens Creek (silver and gold), and Kensington (gold). The value of mineral production has grown from \$1 billion in 2001 to \$3.5 billion in 2011 and this trend is expected to continue to grow into the future, but at the lower rate.
- **Seafood.** Fishing is the most important economic driver in many parts of the State. The main seafood exports are Salmon, Halibut, other Groundfish, and Shellfish. Forecasting the future of the fishing industry is difficult because it can fluctuate dramatically year-to-year based on changes in climatic conditions from El Nino, decadal Pacific Oscillations, and global warming.
- **Power Generation.** Alaska's residents, industries, and transportation services consume fuel produced from a variety of sources, including coal, natural gas, petroleum, and hydroelectric facilities. In 1960, petroleum was the leading source of fuel consumed in Alaska. Since the late 1980's, and continuing to the present, the leading source has been natural gas. In addition, power generating facilities are a major consumer of fuels, and generate significant freight traffic, usually by barge, rail, or truck.

### *Commodities and Modal Trends and Forecasts*

Alaska's national forecasts expect that demand for non-energy related industrial goods and products (e.g., mixed freight, machinery, instruments, among others) will increase, creating greater demand on international gateways and supply chains. National forecasts also expect declines in the tonnages of crude petroleum and other energy products. However, there is a high degree of uncertainty regarding energy forecasts, since production depends on global demand and pricing, availability of competing supplies, the cost of production/transportation/export from Alaska, and other variable factors.

Forecasting how the economy will develop in the future is fundamental to understanding freight transportation needs in Alaska. Projected changes in traded commodities, those moving to, from, or

through Alaska, are summarized in Exhibit 55 and Exhibit 56 by trade type and transportation mode. Key future trends related to these traded commodities include:

- Domestic trade from Alaska to other states will decline significantly, mostly due to reducing movements of crude petroleum from Alaska to other states by water
- Domestic trade from other states to Alaska will decline slightly
- International exports from Alaska are forecast to increase substantially
- International imports to Alaska are forecast to increase
- International pass-through traffic is forecast to increase substantially
- Despite the decline in crude petroleum tonnage, total trade volume is projected to increase overall

Future expected changes in trade tonnage will impact the need to distribute goods within Alaska; production and consumption of non-traded commodities will also impact the volume of goods distributed within Alaska. As shown in Exhibit 56, annual demand is expected to slightly rise for the following modes:

- Other and unknown (3.1%, which is assumed to include fly-away air cargo and truck deliveries)
- Multiple modes and mail (1.6%, which includes intermodal freight services)
- Trucking (0.4%, in addition to truck tonnage included in the previous two modes)
- Rail (0.2%)

Annual demand is expected to decline for water (-0.8%) and pipeline (-2.8%), largely due to projected declines in North Slope crude petroleum production.

Exhibit 55: Forecasted Changes in Tonnage To, From, and Through Alaska (in Thousands), 2011 to 2040

|   | Air<br>(includes<br>truck-<br>air) | Multiple<br>modes<br>and mail | Other<br>and<br>unknown | Pipeline | Rail | Truck | Water       | Total<br>Change    | Average<br>Annual<br>Growth<br>Rate |
|---|------------------------------------|-------------------------------|-------------------------|----------|------|-------|-------------|--------------------|-------------------------------------|
| <b>Domestic Trade</b>                     |                                    |                               |                         |          |      |       |             |                    |                                     |
| Dom. AK to US                             | 1                                  | -1,168                        | 0                       |          | -19  | 642   | -<br>13,490 | -<br><b>14,034</b> | <b>-2.2%</b>                        |
| Dom. US to AK                             | 22                                 | 129                           | 2                       |          |      | 167   | -636        | <b>-316</b>        | <b>-0.3%</b>                        |
| <b>International Trade, Not Pass-Thru</b> |                                    |                               |                         |          |      |       |             |                    |                                     |



|  | Air<br>(includes<br>truck-<br>air) | Multiple<br>modes<br>and mail | Other<br>and<br>unknown | Pipeline    | Rail         | Truck        | Water         | Total<br>Change | Average<br>Annual<br>Growth<br>Rate |
|--|------------------------------------|-------------------------------|-------------------------|-------------|--------------|--------------|---------------|-----------------|-------------------------------------|
| Intl. Export<br>AK-Origin AK-<br>Gateway         |                                    | 161                           | 2,217                   | 251         | 1,829        | 1,773        | 646           | <b>6,877</b>    | <b>2.9%</b>                         |
| Intl. Export<br>AK-Origin US-<br>Gateway         | 2                                  | 54                            | 4                       |             | 73           | 291          | 4,123         | <b>4,547</b>    | <b>4.4%</b>                         |
| Intl. Import<br>AK-Gateway<br>AK-<br>Destination |                                    | 3                             | 1,181                   | -39         | 15           | 70           | 115           | <b>1,345</b>    | <b>1.5%</b>                         |
| Intl. Import<br>US-Gateway<br>AK-<br>Destination | 1                                  | 37                            | 0                       |             | 0            | 90           | 1             | <b>129</b>      | <b>2.9%</b>                         |
| <b>International Trade, Pass-Thru</b>            |                                    |                               |                         |             |              |              |               |                 |                                     |
| Intl. Export<br>US-Origin AK-<br>Gateway         | 1,760                              | 169                           | 15                      |             | 2            | 154          | 65            | <b>2,165</b>    | <b>4.7%</b>                         |
| Intl. Import<br>AK-Gateway<br>US-<br>Destination | 3,822                              | 3                             | 2                       |             | 0            | 411          | 257           | <b>4,495</b>    | <b>3.7%</b>                         |
| <b>Total Change</b>                              | <b>5,608</b>                       | <b>-612</b>                   | <b>3421</b>             | <b>212</b>  | <b>1,900</b> | <b>3,598</b> | <b>-8,919</b> | <b>5,208</b>    | <b>0.4%</b>                         |
| <b>Average<br/>Annual<br/>Growth<br/>Rate</b>    | <b>4.1%</b>                        | <b>-0.6%</b>                  | <b>4.1%</b>             | <b>1.5%</b> | <b>2.0%</b>  | <b>2.7%</b>  | <b>-1.1%</b>  | <b>0.4%</b>     |                                     |

Source: Analysis of Freight Analysis Framework 3 data

Exhibit 56: Forecasted Changes in Tonnage within Alaska, 2011-2040

| FAF Mode          | Change in Tons (000)<br>Between 2011 and 2040 | Average Annual Growth<br>Rate, 2011-2040 |
|-------------------|---|--|
| Other and Unknown | 3,148   | 3.1%                                     |

|                          |        |       |
|--------------------------|--------|-------|
| Truck                    | 2,834  | 0.4%  |
| Rail                     | 287    | 0.2%  |
| Multiple Modes and Mail  | 139    | 1.6%  |
| Air (includes truck-air) | -109   | -1.4% |
| Water                    | -919   | -0.8% |
| Pipeline                 | -6,922 | -2.8% |

Source: Analysis of Freight Analysis Framework 3 data

### *Modal Network and Facilities Trends and Forecasts*

#### Trucking

In 2013, combination trucks<sup>21</sup> traveled 122 million miles in Alaska, with 34% moving on interstate highways, 40% on arterials, and 26% on other roads. Combination trucking activity is increasing with a 33% increase in Alaska from 2010 to 2013. Around 50% of the miles driven by these types of trucks are in urban areas, with the other 50% driven in rural areas. While combination trucking activity is increasing rapidly in the state, single-unit trucking activity has remained stagnant. In 2013, these trucks drove 3% fewer miles than in 2010. However, single-unit trucking still contributed 360 million miles of movements on Alaska's roadways with an equal distribution among urban and rural areas.

#### Air

Air cargo projections are available for ANC, FAI, and Alaska's aviation system as a whole from the 2013 Alaska International Airport System Planning Study. Air cargo projections included:

- At ANC, transit (or pass-through) tonnage will grow by 2.7% per year, while domestic and international cargo enplaned or deplaned will grow by 4.3% per year. Within-state air cargo enplaned at ANC is projected to grow by 0.8%.
- At Fairbanks International Airport (FAI), transit tonnage is projected to grow by 3.0% per year, while domestic cargo enplaned or deplaned is projected to grow by 4.3% per year, with growth rates very similar to ANC. However, within-state air cargo is projected to be relatively unchanged.
- At other airports in Alaska, air cargo tonnages are expected to increase moderately, at an average rate of 1.8% annually. The Northern region is expected to grow the fastest at 1.9% annually with the Southeast the slowest at 1.4% per year.

<sup>21</sup> A combination truck refers to a truck that has an attached trailer for hauling cargo. A single-unit truck refers to a truck where the cargo carrying area is integrated with the body of the truck.

## Marine

Historic trends and future projections for marine cargo present a mixed story. For example, future volumes will largely depend on the extent of resource development projects and construction activity supported by marine freight. The Port of Valdez has seen significant declines in volume since 2006, due to reduced production of North Slope crude moved by pipeline to the port for shipment to out-of-state refineries. If these declines continue, as currently projected, the same level of year-to-year traffic losses is anticipated. Alternatively, if crude production stabilizes or increases, port volumes could stabilize or increase.

Container traffic through the Port of Anchorage is expected to increase slightly through 2023. Fuel volumes are expected to decrease slightly, and then rebound slightly. The Port of Anchorage will move significant tonnages of cement, materials, and large/heavy “project cargo” to support planned construction projects throughout the state.

Vessel traffic through the Northern Sea Route has been growing rapidly over the last few years. In 2013, 71 vessels took this route, up from 46 the year before. It is difficult to predict how many vessels will be using this route in the future, because of the lack of historical data or precedent to draw from. One estimate cited by the US Army Corps of Engineers calculated that the figure could be as high as 1,200 ships per year by 2020, a dramatic increase, and one that could potentially support Arctic Port development.

## Railroad

Rail tonnage is expected to grow at a modest rate per year through 2035. However, there will be changes in the composition of rail commodities. For example, petroleum products will decrease by 4.7% per year, although they currently represent only 19% of all cargo. Volumes of most commodities are expected to remain roughly unchanged. Coal will increase moderately by 1.8% per year. These forecasts do not include the effect of potential new rail extensions that could be built over the coming decades.

## Pipeline

Projections for the pipeline's future use are very uncertain because of the dependence on the amount of future exploration and drilling activities, especially in the ANWR region. The pipeline currently serves as the only alternative for transporting Alaska's oil for export and commercialization.

## *Likelihood of Increased Seasonal Variability*

Increasing average temperatures, rising sea levels, and related effects will exacerbate seasonal variations in freight demand and freight infrastructure availability across many regions of the state, creating greater unpredictability and variability in freight commodity movements from season-to-season and year-to-year.

## Needs

To provide acceptable freight system performance, defined as available, reliable, affordable, timely, safe and secure, the *Alaska LRTP Freight Element* addresses the following expected needs and opportunities:

- **Bringing more resources efficiently to markets.** Providing freight transportation capacity to directly support new resource development if and when it occurs. This will include a variety of initiatives such as new construction of a statewide liquid natural gas (LNG) pipeline; development of “roads to resources” under the state’s “R2R” program; improvement of the Dalton Highway, coastal ports, and possibly other infrastructure to accommodate proposed mining operations; construction of the Susitna Hydroelectric project; and potential development of an Arctic Port to support exploration of petroleum reserves in the Beaufort and Chukchi seas.
- **Improving truck access to intermodal facilities (ports, airports, etc.) and enhancing freight mobility in growing urbanized areas and key corridors.** Reducing truck congestion and improving travel time reliability and safety in urban areas and key corridors is a key need. Needs for improving truck moves to/from ports, airports, and other major freight trip generators will be essential, while at the same time, accommodating the needs of a changing population, which will be larger and increasingly concentrated in urban areas.
- **Maintaining and enhancing critical trade gateway facilities.** Maintaining and improving trade gateways including seaports, airports, and land border crossings, are the lifelines for Alaska’s producers and consumers.
- **Maintaining and enhancing critical connections with Alaska’s rural communities, and doing so with constrained public funds.** Maintaining and improving multi-modal connectivity among and between Alaska’s urban and rural communities, including the provision of alternative facilities, services, or modes to improve reliability, cost, and overall performance, is an essential future planning consideration for the state.

Freight planning must consider uncertainty and risk. The key areas associated with these risks in Alaska include:

- **Identifying how resource development and other freight drivers might evolve in the future.** While the public sector may have some influence on future freight demand, the primary drivers are population growth and private industry activities. However, the public sector can play a very significant role in ensuring the multi-modal transportation system is positioned to meet future needs. Preserving and/or improving performance may involve repairing or expanding infrastructure, implementing new technologies or management practices, improving service availability and reliability, and/or adopting innovative policy, financing and implementation approaches.
- **Addressing the impacts of climate change and increasing climate variability.** Climate change will impact both the transportation system and the underlying commodity movements and markets that generate demand and utilization over the system. These changes create risks such

as increased seasonal fluctuations in demand and infrastructure availability, as well as potential long-term changes in Alaska's economy and infrastructure. They also create opportunities, such as the potential to develop an Arctic port.

- **Managing freight transportation costs.** With a high dependence on goods imported from other states and countries, a high dependence on air cargo (one of the most expensive forms of freight transportation), and long supply chain distances within the state, the cost of goods in Alaska communities off the road system tends to be very high. Without "bypass mail" service, in which rural air cargo is delivered at postal rates, the cost would be even higher.
- **Addressing funding uncertainties.** Much of Alaska's infrastructure is aging, and the costs of maintaining and operating the system are increasing. At the same time, system expansion and modernization will be required. The good news is that much of Alaska's freight infrastructure is privately-owned, self-funded from revenue streams, or built through public-private partnerships administered through AIEDA and other public partners. The bad news is that much of Alaska's freight infrastructure is funded through traditional transportation state and federal funding sources. State funding will likely be reduced in the short term, but federal surface transportation funding provided through the recent FAST reauthorization should maintain Alaska's highway and transit funding for the next five years.

### *Performance Measures*

Alaska's freight transportation infrastructure may accommodate, encourage, or constrain the demand for freight movement. Based on the level of performance offered, the freight system can significantly affect industry location and expansion decisions, as well as larger population settlement patterns.

Alaska's freight transportation system is performing reasonably well today. Performance risks which are expected to increase in coming years include:

- Congested truck routes and intermodal connectors
- Limited route and modal service choices, especially for rural communities
- Unreliability or unavailability of services due to seasonal effects or other disruptions
- Overall cost of goods
- Missing infrastructure links and facility improvements that are needed to serve new industries and population growth

The Freight Element builds on general freight performance categories including availability, reliability, affordability, speed, safety, and security and provides a framework to quantify, measure, and monitor key freight performance metrics, including:

- Availability – includes whether a modal service is available at all
- Reliability – includes door-to-door on-time performance, risk of temporary or sustained disruption, possibility that a service may not be available, risk of losing connectivity or service

due to reliance on a single mode (freight shippers rank reliability as the single most important factor in freight transportation logistics decisions)

- Cost – includes prices paid for transportation services, inventory, “buffering” against risks, premiums paid because a preferred mode is not available
- Speed – includes total delivery time with some freight (e.g., perishables) requiring speed as a top priority, and paying premium prices for the fastest available services, while other freight (e.g., coal or stone) is less concerned with speed and more with price, and will prefer slower modes at lower prices
- Safety and Security – includes the risk of loss, breakage, tampering, loss of visibility, or other loss of value during the shipment process

## Climate Change / Extreme Weather Events

Alaska’s location and geographic extent has presented many unique climate stressors uncommon in the lower 48 states. There are three primary factors that influence climate in Alaska: <sup>22</sup>

1. **Latitude.** The State experiences extreme seasonal variability in solar radiation due to the geographic extent of Alaska and its high latitude environment.
2. **Continentality.** A significant portion of Alaska is influenced by ocean waters and the seasonal distribution of sea ice; locations influenced by the sea typically experience relatively small seasonal temperature variability with high humidity, whereas inland locations can experience large daily and annual temperature range, low humidity, and relatively light and irregular precipitation.
3. **Elevation.** The altitude of a given location above sea level influences its climate. While lower elevations experience extreme cold in the winter and high summertime temperatures, locations at high elevations receive much greater precipitation and generally have cooler temperatures.

## Climate Trends

Previous studies have identified climate risks that pose a threat to the state’s critical infrastructure outlined in Exhibit 57.<sup>23</sup>

### Exhibit 57: Anticipated Impacts of Climate Trends

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<sup>22</sup> Shulski, M., and Wendler, G. (2007). *The Climate of Alaska*. University of Alaska Press, Fairbanks, Alaska, 214.

<sup>23</sup> Adaptation Advisory Group. (2010). *Alaska’s Climate Change Strategy: Addressing Impacts in Alaska*. Juneau, AK.

ConnorCold Bay, B., and Harper, J. (2013). “How Vulnerable Is Alaska’s Transportation to Climate Change?” *TR News*, Washington, D.C., (284), 23–29.

MacArthur, J., Mote, P., Ideker, J., Figliozzi, M., and Lee, M. (2012). *Climate Change Impact Assessment for Surface Transportation in the Pacific Northwest and Alaska*. Olympia, Washington.

Markon, C. J., Trainor, S. F., and Chapin, F. S. (2012). *The United States National Climate Assessment - Alaska Technical Regional Report*. Reston, Virginia, 148.

| Trends   | Anticipated Impacts  |
|--|--|
| <b>Increasing temperatures</b>   | <ul style="list-style-type: none"> <li>• Melting polar ice raising sea level</li> <li>• Retreat of glaciers</li> <li>• Increase storm intensity, wildfires, coastal flooding, droughts, crop failures, and loss of habitat and threatened plant and animal species.</li> </ul> |
| <b>Changing precipitation</b>  | <ul style="list-style-type: none"> <li>• Increase in occurrence of extreme precipitation events</li> <li>• Induce higher stream flows and could lead to more flooding</li> </ul>   |
| <b>Warming and thawing permafrost</b>  | <ul style="list-style-type: none"> <li>• Multiple vulnerabilities—including drier landscapes and more wildfires—that will increase the cost of maintaining infrastructure</li> <li>• Release of heat-trapping gases that increase climate warming</li> </ul>                   |
| <b>Sea level change</b>  | <ul style="list-style-type: none"> <li>• Exacerbate the impact of coastal storms</li> <li>• Increased coastal erosion and flooding</li> </ul>  |
| <b>Coastal erosion</b>   | <ul style="list-style-type: none"> <li>• Increase vulnerability to coastal residents</li> <li>• Damage to coastal communities, deepening pressure to relocate</li> </ul>   |
| <b>Decreased duration (cold season) and extent (warm season) of sea ice and Arctic changes</b> | <ul style="list-style-type: none"> <li>• Coastal erosion, leaving coastal communities more susceptible to larger waves generated by severe storms</li> <li>• Greater ship access and offshore development</li> </ul>   |

Consideration for these trends in the long-range planning process is important because they could increase infrastructure vulnerability and increase the cost of maintenance and reconstruction. In addition, given the limited redundancy of the Alaska Transportation System, there is an increased risk to system performance. Warming permafrost, coastal erosion, and increasingly dramatic storms and flood events are already causing frequent cracking, and washing away of the State’s highways, runways, and other infrastructure.<sup>24</sup>

<sup>24</sup> <http://onlinepubs.trb.org/onlinepubs/trnews/trnews284Alaska.pdf>

## *Temperature*

Long term temperature increases in Alaska vary across regions and seasons. Most of the increases have occurred in the winter and spring, with the least amount of change in autumn.<sup>25</sup> Exhibit 58 below illustrates the change in seasonal average temperatures across regions and seasons for each community.

Plan  
Draft

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<sup>25</sup> <http://akclimate.org/ClimTrends/Change/TempChange.html>



Exhibit 58: Total Change in Mean Seasonal and Annual Temperature (°F), 1949-2014

| Region              | Location       | Winter | Spring | Summer | Autumn | Annual |
|---------------------|----------------|--------|--------|--------|--------|--------|
| <b>Arctic</b>       | Barrow         | 7.4    | 5.2    | 3.5    | 6.3    | 5.6    |
| <b>Interior</b>     | Bettles        | 6.7    | 3.8    | 1.6    | 1.8    | 3.6    |
|                     | Fairbanks      | 6.7    | 3.1    | 2.1    | 0.8    | 3.3    |
|                     | Delta Junction | 8.5    | 3.0    | 0.8    | 0.7    | 3.3    |
|                     | McGrath        | 7.5    | 4.0    | 2.4    | 2.2    | 4.1    |
|                     | Kotzebue       | 6.8    | 1.6    | 2.6    | 2.9    | 3.5    |
| <b>West Coast</b>   | Nome           | 4.3    | 2.6    | 2.2    | 1.4    | 2.7    |
|                     | Bethel         | 6.7    | 3.3    | 1.7    | 0.7    | 3.2    |
|                     | King Salmon    | 8.2    | 3.8    | 1.3    | 1.4    | 3.7    |
|                     | St. Paul       | 0.2    | 1.0    | 2.3    | 1.2    | 1.2    |
|                     | Cold Bay       | 1.8    | 1.1    | 1.9    | 1.1    | 1.5    |
|                     | Talkeetna      | 8.6    | 4.8    | 2.6    | 3.2    | 4.8    |
| <b>Southcentral</b> | Gulkana        | 7.6    | 2.1    | 0.6    | 0.1    | 2.6    |
|                     | Anchorage      | 5.5    | 3.2    | 1.2    | 1.6    | 3.0    |
|                     | Homer          | 6.0    | 3.2    | 2.9    | 2.3    | 3.6    |
|                     | Kodiak         | 1.0    | 1.8    | 1.2    | 0.0    | 1.0    |
|                     | Yakutat        | 5.0    | 2.6    | 1.9    | 1.0    | 2.6    |
| <b>Southeast</b>    | Juneau         | 6.2    | 2.7    | 1.8    | 1.5    | 3.0    |
|                     | Annette        | 3.2    | 2.1    | 1.5    | 0.6    | 1.9    |
|                     | <b>Average</b> | 5.7    | 2.9    | 1.9    | 1.6    | 3.1    |

Source: The Alaska Climate Research Center

In 2014, the mean average annual temperature of the 19 first order climatological stations in Alaska was 35.6 °F, which is a 3 °F increase from the 30-year normal of 32.6 °F. This increase surpasses the previously held record for the warmest year in 1926. In 2013, the average temperature deviated 0.7 °F from the normal while in 2012, the temperature deviated -2.9°F from the normal.<sup>26</sup>

All regions across the state experienced above normal temperatures in 2014, as illustrated in Exhibit 59.

<sup>26</sup> <http://akclimate.org/Summary/Statewide/Annual/2014>

Exhibit 59: 2014 Mean Temperature and Deviations from Mean

| Station         | Temperature      |                |               |
|-----------------|------------------|----------------|---------------|
|                 | Observed<br>(°F) | Normal<br>(°F) | Delta<br>(°F) |
| Anchorage       | 39.6             | 37.1           | 2.5           |
| Annette         | 46.9             | 46.6           | 0.3           |
| Barrow          | 14.9             | 11.8           | 3.1           |
| Bethel          | 34.9             | 30.7           | 4.2           |
| Bettles         | 26.1             | 23.5           | 2.6           |
| Cold Bay        | 42.5             | 38.8           | 3.7           |
| Delta Junction  | 31.7             | 29.0           | 2.7           |
| Fairbanks       | 30.9             | 27.7           | 3.2           |
| Fulkana         | 29.0             | 28.2           | 0.8           |
| Homer           | 43.7             | 38.7           | 5.0           |
| Juneau          | 43.0             | 42.1           | 0.9           |
| King Salmon     | 40.4             | 35.2           | 5.2           |
| Kodiak          | 43.7             | 40.9           | 2.8           |
| Kotzebue        | 28.4             | 22.9           | 5.5           |
| McGrath         | 31.7             | 27.4           | 4.3           |
| Nome            | 31.6             | 27.4           | 4.2           |
| St. Paul Island | 38.2             | 35.4           | 2.8           |
| Talkeetna       | 38.4             | 36.0           | 2.4           |
| Yakutat         | 41.1             | 40.3           | 0.8           |

Source: The Alaska Climate Research Center

If this warming trend continues, Alaska could be impacted in a number of ways—including melting polar ice raising sea level, the retreat of glaciers, increasing storm intensity, wildfires, coastal flooding, droughts, crop failures, and loss of habitat and threatened plant and animal species.<sup>27</sup>

### Precipitation

The mean annual observed precipitation of the 19 first order climatological stations was 34.82 inches, which is 4 percent above the long-term mean (Exhibit 60). Regionally, Barrow experienced the largest positive deviation from normal precipitation, followed by Fairbanks. The large increase in precipitation

<sup>27</sup> <http://climatechange.alaska.gov/cc-ak.htm>

in Barrow is attributed to warmer temperatures in the North Slope and more water observed in both the Beaufort and Chukchi Seas, supplying a ready source of water vapor.<sup>28</sup> Fairbanks' deviation can be attributed to the extremely high precipitation—in June 2014, precipitation was 260 percent of the normal amount, which set the wettest June record for Fairbanks. Increases in precipitation will induce higher stream flows and could lead to more flooding.<sup>29</sup>

Exhibit 60: 2014 Precipitation Deviations from Normal (1981-2010)

| Station         | Precipitation |             |            |           |                     |
|-----------------|---------------|-------------|------------|-----------|---------------------|
|                 | Observed (in) | Normal (in) | Delta (in) | Delta (%) | Observed/Normal (%) |
| Anchorage       | 18.87         | 16.58       | 2.29       | 14%       | 114%                |
| Annette         | 108.94        | 101.63      | 7.31       | 7%        | 107%                |
| Barrow          | 7.4           | 4.53        | 2.87       | 63%       | 163%                |
| Bethel          | 15.82         | 18.54       | -2.72      | -15%      | 85%                 |
| Bettles         | 16.5          | 14.9        | 1.6        | 11%       | 111%                |
| Cold Bay        | 33.81         | 41.67       | -7.86      | -19%      | 81%                 |
| Delta Junction  | 11.08         | 11.62       | -0.54      | -5%       | 95%                 |
| Fairbanks       | 17.16         | 10.81       | 6.35       | 59%       | 159%                |
| Fulkana         | 14.31         | 11.26       | 3.05       | 27%       | 127%                |
| Homer           | 22.62         | 24.34       | -1.72      | -7%       | 93%                 |
| Juneau          | 68.69         | 62.27       | 6.42       | 10%       | 110%                |
| King Salmon     | 22.41         | 19.49       | 2.92       | 15%       | 115%                |
| Kodiak          | 89.44         | 78          | 11.44      | 15%       | 115%                |
| Kotzebue        | 9.61          | 11          | -1.39      | -13%      | 87%                 |
| McGrath         | 11.8          | 18          | -6.2       | -34%      | 66%                 |
| Nome            | 14.21         | 16.81       | -2.6       | -15%      | 85%                 |
| St. Paul Island | 23.62         | 23.67       | -0.05      | 0%        | 100%                |
| Talkeetna       | 20.24         | 27.97       | -7.73      | -28%      | 72%                 |
| Yakutat         | 134.96        | 155.12      | -20.16     | -13%      | 87%                 |

Source: The Alaska Climate Research Center

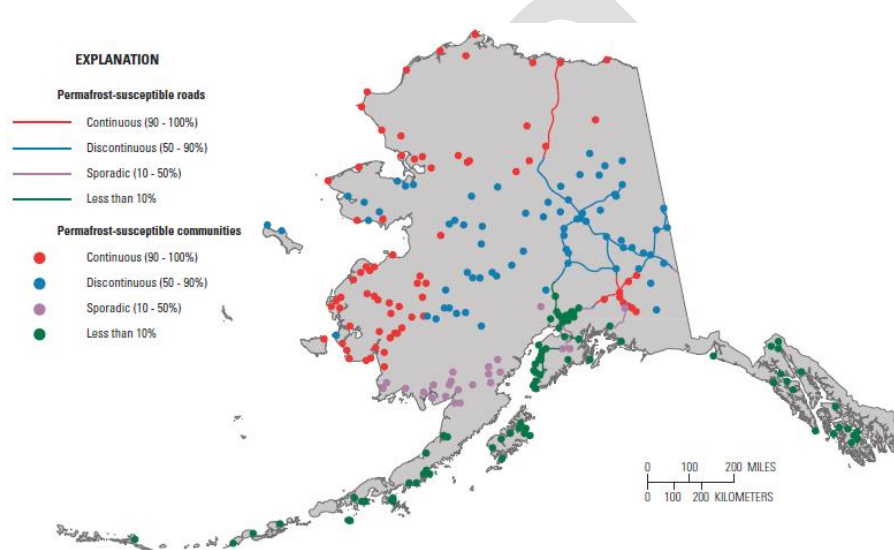
<sup>28</sup> G. Wendler, B. Moore, K. Galloway, 2014, Strong Temperature Increase and Shrinking Sea Ice in Arctic Alaska, *The Open Atmospheric Science Journal*, 8, 7-15

<sup>29</sup> <http://climate.dot.gov/documents/workshop1002/smith.pdf>

### Thawing of Permafrost

Alaska has more than 6,600 miles of coastline—and approximately 80 percent of that land mass has an underlayer of permafrost.<sup>30</sup> The thawing of permafrost can lead to the release of heat-trapping gases into the atmosphere that can increase climate warming. In addition, it will affect Alaska’s infrastructure as temperatures become increasingly warmer (leading to drier landscapes and more wildfires) and permafrost is disrupted during infrastructure construction. Thawing permafrost can lead to damage to buildings, road, and pipelines, and potential hazards caused by uneven ground surface settlement related to thawing of ground ice, resulting in additional maintenance, mitigation, adaptation, and/or relocation costs.<sup>31</sup> This will result in additional cost to reduce or mitigate infrastructure damage or settlement, or result in additional maintenance, rebuilding, and reinvestment for existing infrastructure. Exhibit 61 below identifies the roads and communities that are located in areas vulnerable to permafrost degradation.

**Exhibit 61: Alaskan Roads and Communities Susceptible to Permafrost Thaw**



**Summary of Alaska Highways Susceptible to Permafrost**

| Permafrost extent        | Road distance, in miles |
|--------------------------|-------------------------|
| Continuous (90 - 100%)   | 456                     |
| Discontinuous (50 - 90%) | 1,211                   |
| Sporadic (10 - 50%)      | 189                     |
| Less than 10 %           | 281                     |

**Summary of Alaska Communities Susceptible to Permafrost**

| Permafrost Extent        | Total Communities | Population |
|--------------------------|-------------------|------------|
| Continuous (90 - 100%)   | 87                | 40,811     |
| Discontinuous (50 - 90%) | 79                | 47,140     |
| Sporadic (10 - 50%)      | 26                | 5,235      |
| Less than 10 %           | 129               | 396,821    |

Source: *The United States National Climate Assessment—Alaska Technical Regional Report, Adopted from U.S. Arctic Research Commission Permafrost Task Force, 2003*

<sup>30</sup> <http://onlinepubs.trb.org/onlinepubs/trnews/trnews284Alaska.pdf>

<sup>31</sup> <http://climatechange.alaska.gov/cc-ak.htm>

## Sea Level Change

Relative sea level, which is defined as the height of the ocean surface relative to the height of the land surface, is the most effective metric to measure the impacts of sea level on the built environment. Unlike many parts of the continental U.S., changes in both sea levels and land surfaces vary along Alaska's coastline. Mean sea level has changed along the Alaska coast at slow rates (less than 0.08 to 0.1 inches per year). For example, in the Gulf of Alaska the ocean surface has been falling at rates of up to a fraction of an inch per year (primarily within the range of 0.04-0.07 inches/year).<sup>32</sup>

In contrast to slow rates of sea level change, the Alaskan land surface can move up or down several times faster. Uplift or subsidence of the land surface controls the emergence and submergence of the coastline. In Alaska, the primary factors controlling land surface uplift or subsidence are tectonic plate buildup and glacial mass changes. For example, in the Kenai Peninsula glacial mass changes cause uplift rates of 0.4 inches per year or more (with peak uplift rate exceeding 1.2 inches per year) which is significantly greater than mean sea level rise along the Alaskan coastline.<sup>33</sup>

Tectonic plate movements also affect land uplift or subsidence. In southern Alaska the oceanic Pacific plate is being thrust underneath the North American plate. This creates paired bands of subsidence, which is mostly offshore, and uplift, which is mostly onshore; earthquakes generally reverse this pattern. For example, the Great Alaska earthquake of 1964 resulted in the uplift of a large area in Prince William Sound and the Copper River delta which is now subsiding whereas Cook Inlet on the Kenai Peninsula subsided during the 1964 earthquake and has been uplifting since then.<sup>34</sup>

Global mean sea level in Alaska is expected to rise 24 to 63 inches (0.2-0.6 inches/year) through the 21st century. Even if sea level were to rise on the lower end of estimates, it is likely that circulation patterns will change in the Northeast Pacific Ocean again and result in a period of greater than global average mean sea level rise for the Alaskan coastline. For the majority of the Alaskan coastline, this means that sea level change will be dominated by land submergence. However, in Southeast Alaska this would still result in emergence, but with rates of land surface uplift that are less than today. The occurrence of another earthquake in combination with greater rates of sea level rise could result in even greater rates of coastal emergence or submergence.<sup>35</sup>

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<sup>32</sup> Markon, C. J., Trainor, S. F., and Chapin, F. S. (2012). *The United States National Climate Assessment - Alaska Technical Regional Report*. Reston, Virginia, 148.

<sup>33</sup> Markon, C. J., Trainor, S. F., and Chapin, F. S. (2012). *The United States National Climate Assessment - Alaska Technical Regional Report*. Reston, Virginia, 148.

<sup>34</sup> Markon, C. J., Trainor, S. F., and Chapin, F. S. (2012). *The United States National Climate Assessment - Alaska Technical Regional Report*. Reston, Virginia, 148.

<sup>35</sup> Markon, C. J., Trainor, S. F., and Chapin, F. S. (2012). *The United States National Climate Assessment - Alaska Technical Regional Report*. Reston, Virginia, 148.

## Coastal Erosion

The erosion of inhabited shorelines along the western Alaskan coast, particularly in the southeast Chukchi Sea, due to extreme wave events presents a significant concern to many communities. Although the waves generated from coastal storms are only approximately 10 to 13 feet in height, their impact on low-lying, permafrost-rich bluffs can cause several feet of shoreline to wash away in one storm. Over the last two decades, the mean significant wave height in the southeastern Chukchi Sea increased at an average rate of 0.066 feet/year and increased at an average rate of 0.082 feet/year in the Pacific-Arctic region.<sup>36</sup> This increased wave height may be attributed to a longer open-water season, which can be attributed to a decline in sea ice.<sup>37</sup>

## Sea Ice and Arctic Changes

Arctic Alaska is located north of the Brooks Range, and is also referred to as the North Slope of Alaska. Summers are short and winters are very long; there are only three months a year when the mean temperature is above freezing. This has resulted in permafrost that thaws in the summer only. In recent years, a warming trend has been observed. Sea ice data available between 1979 and 2012 show a strong decrease in sea ice concentrations of 14 percent for Beaufort Sea and 16 percent for Chukchi Seas. During the same time period, there was a mean annual temperature increase of 36.9 °F, which points to an accelerated increase of warming over the prior decades. If this trend continues, sea ice will become a winter phenomenon in the Beaufort and Chukchi Seas and will disappear in late summer and early autumn.<sup>38</sup> Furthermore, over the past 50 years erosion rates in the Arctic have been high and are expected to continue to increase due to warming trends, which results in longer open-water periods and thus increased wave action.<sup>39</sup>

Less ice means more open water—which leads to a greater absorption of solar energy and subsequently, an increased warming in the ocean. This, in turn, leads to accelerated ice loss. The loss of sea-ice cover changes habitat for arctic species and leaves coastal communities more exposed to larger waves generated by severe storms. However, more open water will also result in increased access and vessel traffic to the Arctic—which creates more opportunities for natural resource development.<sup>40</sup>

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<sup>36</sup> Francis, O. P., Panteleev, G. G., and Atkinson, D. E. (2011). "Ocean wave conditions in the Chukchi Sea from satellite and in situ observations." *Geophysical Research Letters*, 38(24), online ed.

<sup>37</sup> Connor, B., and Harper, J. (2013). "How Vulnerable Is Alaska's Transportation to Climate Change?" *TR News*, Washington, D.C., (284), 23–29.

<sup>38</sup> <http://benthamopen.com/contents/pdf/TOASCJ/TOASCJ-8-7.pdf>

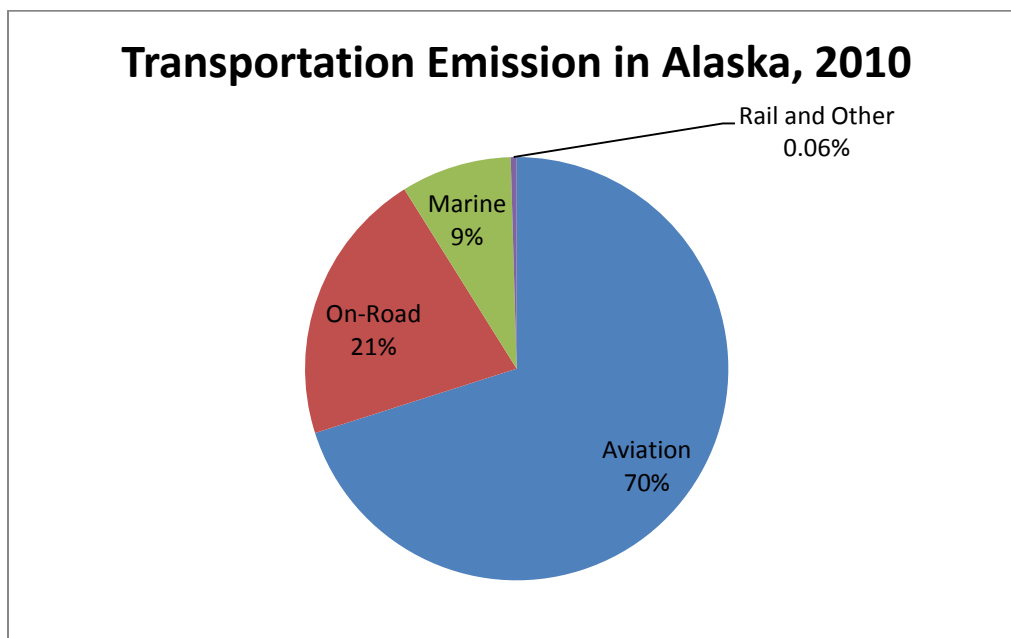
<sup>39</sup> Clement, J. P., Bengston, J. L., and Kelly, B. P. (2013). *Managing for the Future in a Rapidly Changing Arctic: A Report to the President*. Washington, D.C., 59.

<sup>40</sup> <http://climatechange.alaska.gov/cc-ak.htm>

## Greenhouse Gas Emissions

In addition to the climate trends discussed in the previous section, greenhouse gas emissions will also drive future climate change patterns. Statewide greenhouse gas emissions from all sources have been on the decline, including those from transportation source. Statewide emissions peaked in 2005 and by 2009, had declined 23 percent.<sup>41</sup> Transportation emissions are generated by burning fuel in cars, trucks, snow machines, boats, aircraft, construction equipment, and other mobile equipment.<sup>42</sup> While the industrial sector, including the oil and gas industries, produces the most greenhouse gas emissions in the state, the transportation sector produces the second most. In 2010, transportation contributed to nearly a third of the state's greenhouse gas emissions. Exhibit 62 illustrates the breakdown of transportation emissions by mode. Aviation comprises the majority of transportation emissions (70 percent), followed by on-road, (21 percent), marine (9 percent) and Rail and other (0.06 percent).

Exhibit 62: Transportation Emissions in Alaska, 2010



Source: Alaska State Greenhouse Gas Emissions Inventory, March 2015

Exhibit 63 depicts the transportation sector emission trends between 1990 and 2010.<sup>43</sup> The decline in aviation emissions between 2007 and 2009 (a 35 percent decrease) can be attributed, in part, to the recession and changes in transport patterns. Marine emissions experienced a similar pattern, although

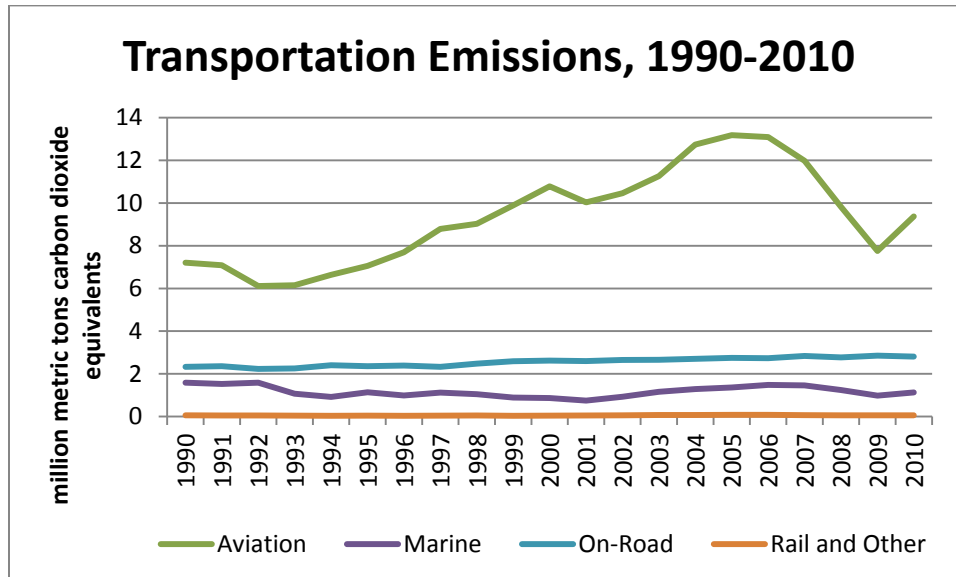
<sup>41</sup> <https://dec.alaska.gov/air/anpms/Projects&Reports/DOCS/GHG-Inventory-Report-2015.pdf>

<sup>42</sup> <https://dec.alaska.gov/air/anpms/Projects&Reports/DOCS/GHG-Inventory-Report-2015.pdf>

<sup>43</sup> <https://dec.alaska.gov/air/anpms/Projects&Reports/DOCS/GHG-Inventory-Report-2015.pdf>

at a much lower level. On-road emissions have increased steadily over the last two decades, while emissions from Rail and other transportation sources (including tractors), have remained relatively flat.

Exhibit 63: Transportation Emissions in Alaska, 1990-2010



Source: Alaska State Greenhouse Gas Emissions Inventory, March 2015

## Safety

Safety is a serious consideration in Alaska’s transportation planning process as a means to eliminate transportation system-related deaths. The DOT&PF has updated its safety plans, processes, and agency and private sector stakeholder involvement methods over the past decade on an on-going basis to help improve the state’s overall safety program. While the primary plans and policies supporting the DOT&PF’s safety program are addressed outside of the LRTP process, linking these elements to the LRTP is an important step in developing as comprehensive a planning document as possible for Alaska. The following section presents the latest safety planning and policy efforts developed by the state to meet the latest trend of significantly reducing statewide transportation system related fatalities and accidents.

There were 12,576 motor vehicle-related crashes in Alaska in 2011, and as a result of these crashes 4,785 Alaskans suffered injuries and 71 were killed. Alaska’s goal for transportation safety, known as *Toward Zero Deaths*, is to gradually eliminate all transportation-related deaths by reducing the number of fatalities and major injuries occurring on the state’s public roadways each year. To identify existing safety trends and strategies to accomplish this zero-death goal, the *2012 Strategic Traffic Safety Plan* and the *FFY 2015 Highway Safety Plan* were reviewed and summarized in this section. These sources were used to present Alaska’s existing and future safety conditions, trends, and the strategies for achieving the state’s safety goals and objectives.



Alaska's 2012 *Strategic Traffic Safety Plan (STSP)*, updated from the 2007 Strategic Highway Safety Plan (SHSP), provides a comprehensive approach to reducing the number of transportation-related fatalities and major injuries on the state's entire public roadway system, not just on highways. By focusing on all public roads, the STSP considers the safety of all transportation modes, not just vehicle users. Building on the 2007 Plan, the 2012 STSP continues to focus on three primary emphasis areas:

- Driver Behavior, targeting impaired driving, and young (under age 20) and older (age 65 and over) drivers
- Roadways, focusing on lane departures, intersections, and collisions with animals
- Special Users, addressing crashes involving pedestrians, bicyclists, and/or motorcyclists

These three emphasis areas were established because they are most commonly involved in transportation-related fatalities and injuries in Alaska. The State Traffic Safety Plan also contains a series of strategies and actions associated with each of the emphasis areas, intended to accomplish the interim goal of reducing transportation-related fatalities and major injuries in Alaska by half by year 2030. Example strategies or action steps that were identified in the STSP included promoting responsible behavior and driving among youths using comprehensive community-based programs; installing more shoulder rumble strips to give motorists an opportunity to correct lane-straying; and adjusting mitigation strategies to pedestrian and bicycle crash patterns (for example, prohibiting right turns on red lights at problem intersections).

Alaska's data-driven *Highway Safety Plan (HSP)* for Federal Fiscal Year 2015 provides a detailed outline for developing a safer and more efficient transportation system for all road users in Alaska, with sections on data analysis and problem identification, goals and objectives, planned projects and programs, and proposed strategies to allocate funds. The HSP is directly related to the STSP (and preceding SHSPs), focusing primarily on the Driver Behavior and Special Users emphasis areas to move the state towards zero deaths on roadways. The specific program areas that the 2015 HSP addresses include impaired driving; occupant protection; speeding; motorcycle safety; pedestrian and bicycle safety; novice drivers; and traffic records. The 2015 HSP provides an overview of each program area, followed by performance targets, strategies, and planned projects to address each. The projects and strategies outlined in the 2015 HSP rely primarily on enforcement and public outreach and education to achieve the identified performance targets and goals.

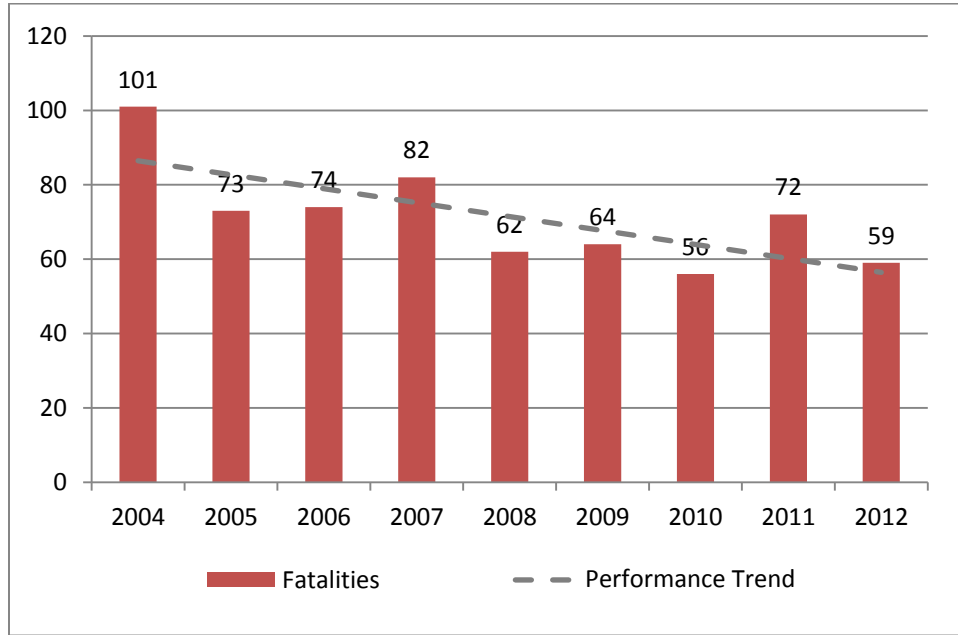
### **Existing Conditions/Trends**

Since the 2007 implementation of the STSP, the trends in Alaska support the steady improvement in traffic safety, including the development of policy and plan steps toward accomplishing its zero deaths goal.

Exhibit 64, Exhibit 65, and

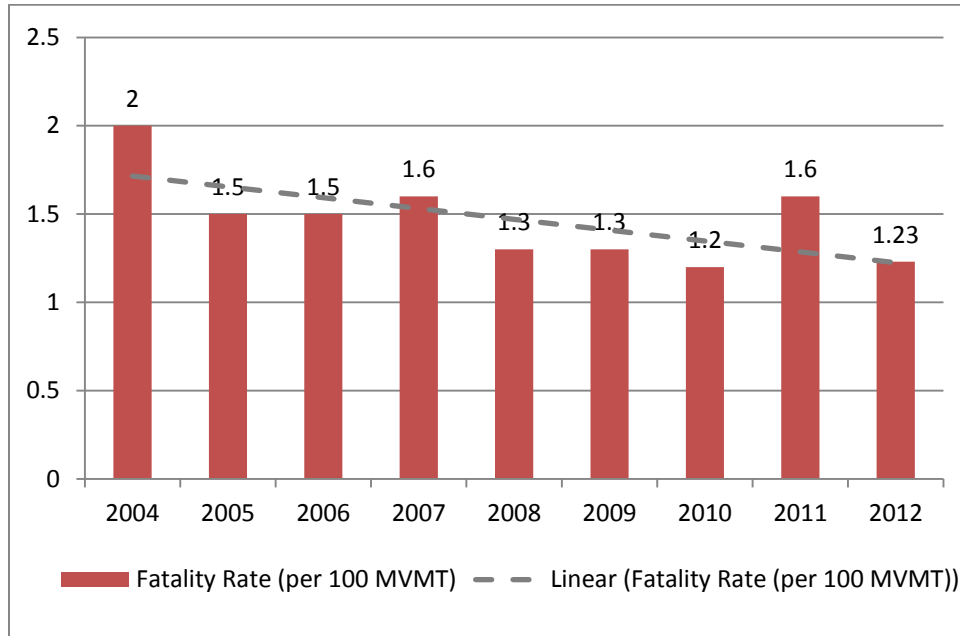
Exhibit 66 illustrate how statewide fatalities have mostly been trending downward since 2004, with the lowest number of recorded fatalities (56 fatalities) in 2010 and lowest number of major injuries (391 major injuries) in 2008.

Exhibit 64: Statewide Transportation System Fatalities



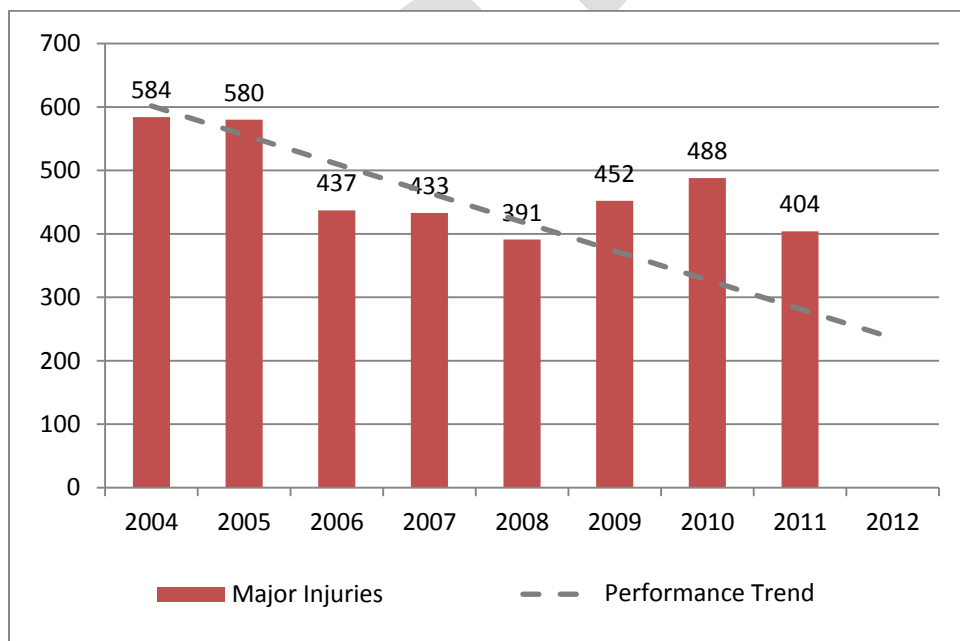
Source: Alaska Highway Safety Plan FFY2015

Exhibit 65: Alaska's Fatality Rate per 100 Million VMT



Source: Alaska Highway Safety Plan FFY2015.

Exhibit 66: Statewide Major Injuries



Source: Alaska Highway Safety Plan FFY2015

The total number of traffic-related fatalities in Alaska fell by 42% between 2004 and 2012. The total number of traffic-related major injuries fell by 31% between 2004 and 2011 (2012 data is not available).

Despite the overall downward trend with fewer fatalities between 2011 and 2012 and fewer major injuries between 2010 and 2011, the most recent statistics for both are still greater than the 2010 fatality and 2008 major injury levels.

### *Driver Behavior*

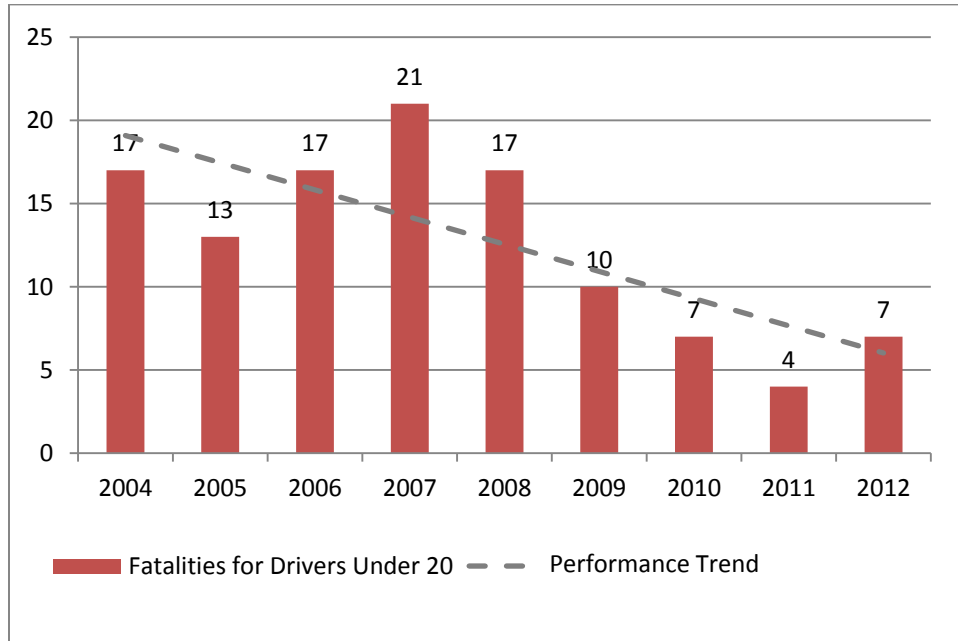
The Driver Behavior emphasis area mentioned in Alaska's previous highway safety plans refer to young/novice drivers (age 20 and under), older drivers (age 65 and over), impaired driving, and occupant protection. Due mostly to inexperience and/or lack of maturity, young drivers are less likely to adjust to hazards and other dangerous road conditions, and are more likely to drive at higher than average speeds. The greatest causes of roadway crashes for young drivers are inattention, speeding, and failure to yield. Based on data gathered between 2004 and 2010, young or novice drivers were involved in 19% of total reported motor vehicle crashes in Alaska. The total number of young driver-involved fatal crashes has dropped 58%, from 17 fatal crashes in 2004 to 7 in 2012 (

Plan  
Draft

Exhibit 67). Despite the overall decline over this period, there was a spike in young driver-involved fatal crashes in 2007 with 21 fatalities, and the 2012 fatal crash levels (7 fatalities) increased from the 2011 levels (4 fatalities).

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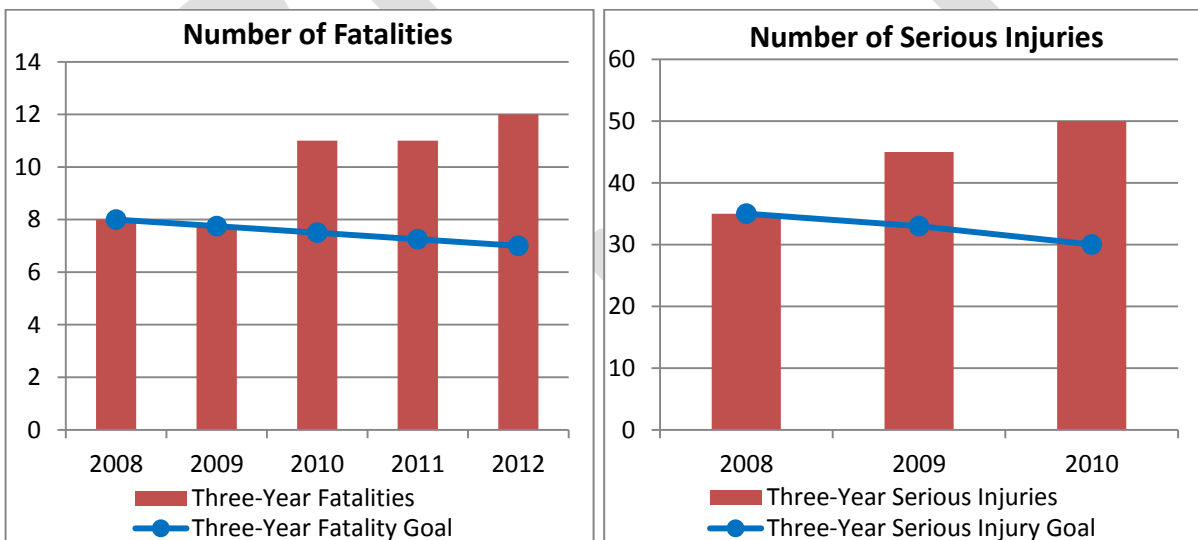
Exhibit 67: Fatal Crashes Involving Young Drivers



Source: Alaska Highway Safety Plan FFY2015

Both fatal crashes and major injuries involving older drivers increased between 2008 and 2011 (Exhibit 68). Roadway crashes involving older drivers are most likely to be caused by failure to yield, failure to properly stop at red lights and stop signs, and making improper turns.

Exhibit 68: Fatalities and Serious Injuries Involving Older Drivers



Source: Alaska's SHSP (2013 Revision to STSP)

According to the 2012 STSP, 30% to 40% of all traffic-related fatalities in Alaska can be attributed to alcohol-impaired drivers. Males are more likely than females to be involved in both impaired-driving fatalities (3 times more likely) and impaired-driving major injuries (2 times more likely) on Alaska's roadways. Impaired driving fatalities are highest amongst the 45- to 54-year old age group, but impaired driving-related major injuries are most common among 21- to 25-year olds. Fatalities associated with impaired driving have declined 28% since 2004, with 32 fatalities in 2004 compared to 23 fatalities in 2014 (Alaska DOT Impaired Driving Fatality Data). However, the number of impaired-driving fatalities in 2014 nearly doubled from 2006, with 12.

Occupant protection in Alaska has been trending upward since 2004, with front seat belt usage increasing from 77% total usage in 2004 to 86% in 2013. Despite the overall upward trend, the 2013 use percentage is still lower than the 89% front seat belt use percentage for 2011. Younger drivers and occupants tend to have a lower seat belt usage rate, and according to the 2015 HSP, vehicle occupants age 25 and under account for 36% of all unrestrained fatalities in Alaska between 2004 and 2012.

In summary, seat belt usage in Alaska has increased overall, and traffic-related fatalities and major injuries have been trending downward among young and impaired drivers. However, both traffic-related fatalities and major injuries have increased among the older driver population.

### *Roadways*

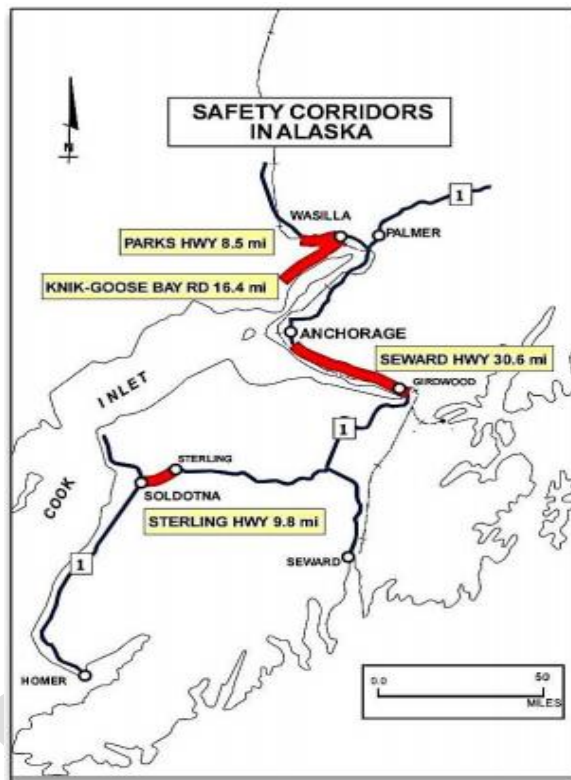
The Roadways emphasis areas in Alaska's previous highway safety plans refer to lane departures, intersection crashes, and collisions with animals (primarily moose). As presented above, the greatest causes of crashes on Alaska's roadways are driver inattention/distraction, speeding, failure to yield, and driver impairment. According to the 2012 STSP, over half of all traffic fatalities in Alaska can be attributed to run-off-road crashes, and a quarter of all fatalities result from intersection crashes. Alaska exceeds the national average with lane departure and intersection-related crashes. This problem may be exacerbated by the lack of hierarchy of Alaska's roadways, leading to conflicts between all roadway users between trucks, tour buses, local traffic, pedestrians, and bicyclists.

To address locations where fatal or major injury crashes are most common, Alaska has implemented Safety Corridors, which are designated segments of the state's highway system that have been targeted for increased safety funding and improvement. There are currently four designated Safety Corridors in Alaska shown in

#### Exhibit 69:

- Seward Highway
- Parks Highway
- Sterling Highway
- Knik/Goose Bay Road

Exhibit 69: Safety Corridors in Alaska



Source: *Safety Corridors in Alaska*, Scott E. Thomas, State of Alaska DOT&PF, 2011.

These roadway segments are popular routes at or near capacity either year round or during summer tourism season. Improvements to these Safety Corridors included roadway realignments, lane additions, improved vehicle turnouts, installation of traffic signals, increased enforcement, and greater focus on public education about roadway safety.

Since the implementation of these Safety Corridors, there has been a significant decrease in crash occurrences on these highway segments. Overall crash occurrences per year decreased 32% on Seward Highway from 2007 to 2013, 50% on Parks Highway from 2006 to 2013, 66% on Sterling Highway from 2009 to 2013, and 77% on Knik/Goose Bay Road from 2009 to 2013 (Alaska DOT 2013 Safety Corridors Audit).

### Special Users

The Special Users emphasis area documented in Alaska's previous highway safety plans refers to pedestrians, bicyclists, and motorcyclists, who are the most vulnerable roadway system users in terms



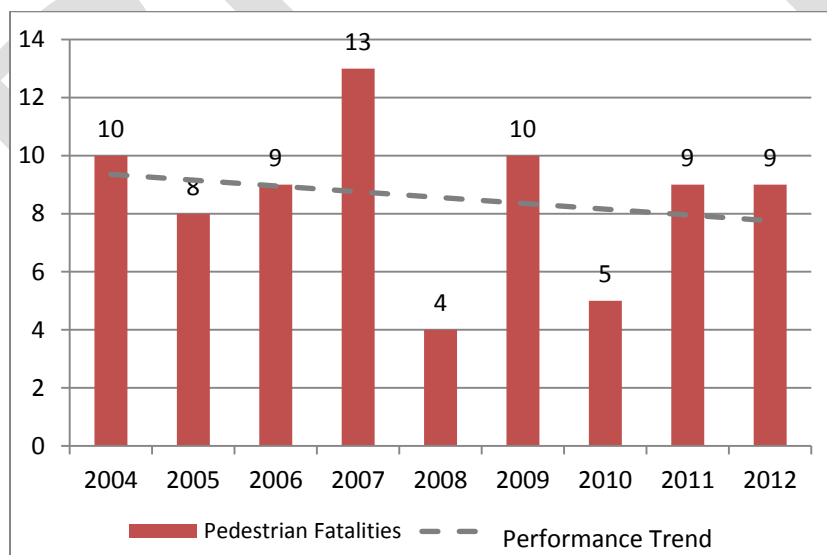
of severity of crashes. Crashes in Alaska involving these special users are caused primarily by unsafe driver behavior (e.g., failure to yield, driver inattention) and unsafe user actions (e.g., jaywalking, following too closely).

Although the number of crashes involving special users accounts for a very small percentage of total crashes in Alaska (pedestrian, bicycle, and motorcycle crashes each account for 1% of all crashes), they represent a disproportionately greater percentage of all fatalities and major injuries compared to vehicle occupants. According to the 2012 STSP, pedestrian-related crashes result in about 11% of all fatalities and 6% of all major injuries in Alaska. Overall, pedestrian-related fatalities and major injuries have been trending downward since 2004 but the trend is very inconsistent, with pedestrian fatalities as high as 13 in 2007 and as low as 4 in 2008 as shown in Exhibit 70.

The majority of pedestrian fatalities occurred with persons 45 and older followed by children 15 and under. While pedestrians of all age groups are at risk of being struck by vehicles, young children and seniors are at the highest risk. The greatest number of pedestrian fatalities and major injuries tend to occur between 3:00 and 9:00 p.m.

Bicycle-related crashes account for approximately 2% of all fatalities and 4% of all major injuries in Alaska. Data from the 2015 Alaska HSP illustrates that bicyclists under age 21 have the highest risk of fatality or major injury, with the highest level of occurrence on weekdays between 3:00 and 6:00 p.m. There are likely roadway conflicts between motorists and bicyclists related to commute/school travel. Similar to pedestrian-related incidents, bicyclist-related fatalities and major injuries are also trending downward but remain inconsistent, with various spikes and drops depending on the year. Motorcycle crashes represent 10% of all fatal crashes in Alaska. This trend in motorcyclist fatalities is also very inconsistent, increasing from 8 fatalities in 2004 to 9 fatalities in 2012.

Exhibit 70: Pedestrian Fatalities



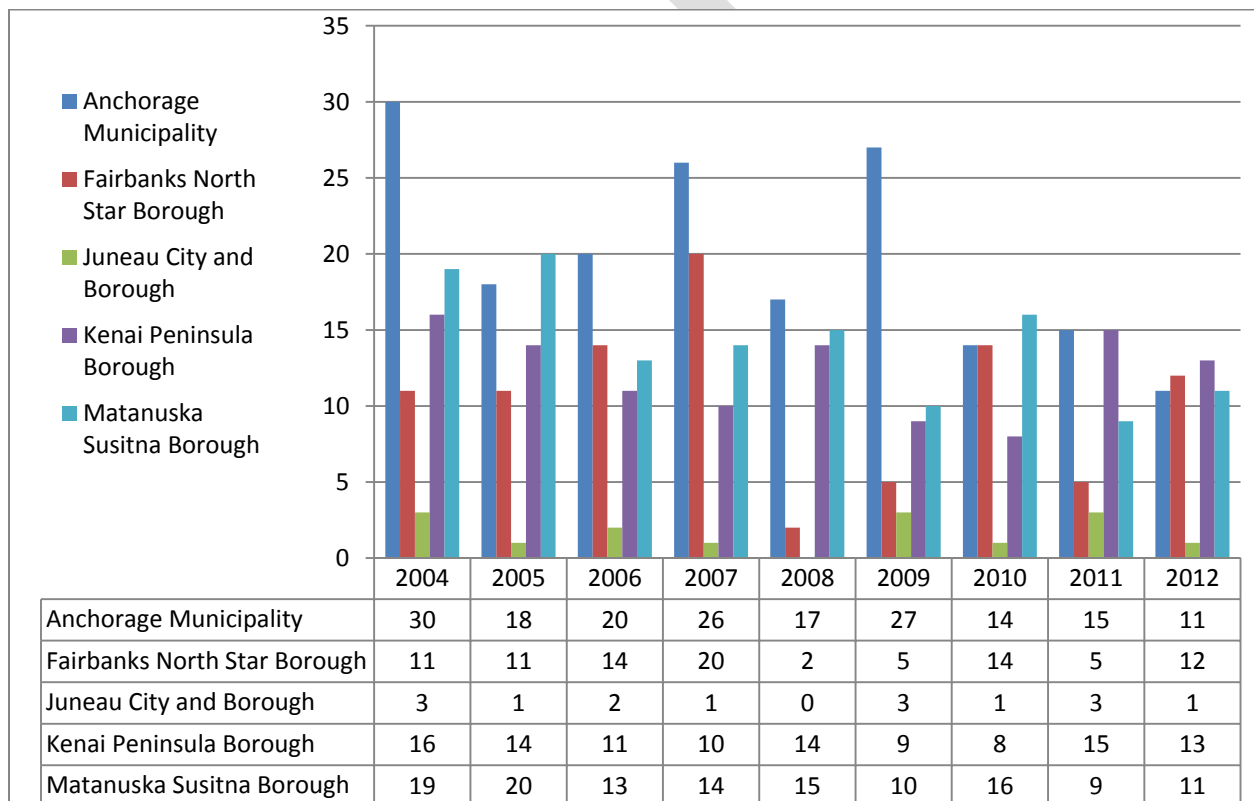
Source: Alaska Highway Safety Plan FFY2015

### Future Expected Conditions/Trends

The majority of Alaska’s traffic fatalities and major injuries occurred on roadways within the state’s five most populated boroughs - Anchorage, Matanuska-Susitna, Fairbanks North Star, Kenai Peninsula, and Juneau. Exhibit 71 shows the number of roadway fatalities that occurred between 2004 and 2012 in each of Alaska’s five most populated boroughs. The highest average number of fatalities occurred in Anchorage. The overall number of traffic fatalities occurring each year in the five boroughs has been trending downward.

The plans reviewed do not present future estimates of accident rates, but these existing trends suggest that overall fatality rates in Alaska are gradually decreasing. In recent years, the VMT in the state has been trending flat while the number of crashes and the fatalities per million VMT have trended downward. Given this, it is reasonable to assume that as VMT continues to be steady, crash rates in Alaska may maintain current levels or continue to decline into the future, thus resulting in fewer fatalities.

Exhibit 71: Fatality Numbers for Alaska’s Five Most Populated Boroughs



Source: Alaska Highway Safety Plan FFY2015

### *Strategies/Objectives*

As previously stated, Alaska's *Toward Zero Deaths* goal aims to gradually eliminate all fatalities and major injuries on the state's roadways. The interim goal is to reduce fatalities and major injuries by one-half by 2030. In order to increase the safety of Alaska's transportation system and make progress toward this interim goal, the main performance targets (from the baseline 2006-2008 three-year average to 2015) identified in the 2015 HSP included:

- Reduce traffic fatalities by 20% from 73 to 59
- Reduce three-year average fatalities by 20% from 73 to 58
- Decrease major injuries by 20% from 420 to 337
- Decrease the fatality rate per 100 million VMT by 20% from 1.46 to 1.17
- Decrease unrestrained fatalities by 20% from 23 to 18
- Increase seat belt usage from 84.9% to 90%
- Decrease alcohol-impaired driving fatalities by 20% from 22 to 18
- Reduce speeding-related fatalities by 20% from 30 to 24
- Reduce motorcyclist fatalities by 20% from 8 to 6
- Reduce young driver-related fatalities by 20% from 18 to 14
- Reduce pedestrian fatalities by 20% from 8 to 7
- Reduce bicyclist fatalities by 100% from 1 to 0

Exhibit 72 presents the results for Alaska's progress in meeting these performance targets thus far (through 2012). From 2008 to 2012, the fatality numbers for most of the state's identified safety performance areas and performance measures have been trending downward overall, despite occasional increases in some years. Recorded front seat belt usage in Alaska has also been steadily increasing. However the trends for pedestrian and motorcyclist fatalities between 2008 and 2012 have been moving upwards, prompting the need for Alaska agencies to focus more resources on engineering, enforcement, and public outreach/education about special user safety issues. Traffic-related fatalities and major injuries have also slightly increased among the older driver population, indicating a need to develop programs and increase awareness of older driver issues in Alaska.

Exhibit 72: Progress on Performance Targets

| Performance Measures   |      | Actual Figures |       |       |       |       |       |       |       |       |       | Goals                          |       |       |       |       |
|--|------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------------------|-------|-------|-------|-------|
|  |      | 2004           | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  | 2011  | 2012  | 2013  | 2014                           | 2015  | 2020  | 2025  | 2030  |
| Fatalities (Actual)  | C-1  | 101            | 73    | 74    | 82    | 62    | 64    | 56    | 72    | 59    | 62    | 60                             | 59    | 50    | 43    | 37    |
| Three-Year Average of Fatalities   |      | 96             | 91    | 83    | 76    | 73    | 69    | 61    | 63    | 62    | 66    | 64                             | 62    | 53    | 45    | 39    |
| Serious Injuries (all crashes)   | C-2  | 584            | 580   | 437   | 433   | 391   | 452   | 488   | 404   | *     | 359   | 348                            | 337   | 288   | 246   | 210   |
| Fatality Rate/100 Million VMT  | C-3  | 2.02           | 1.45  | 1.49  | 1.59  | 1.29  | 1.30  | 1.17  | 1.57  | 1.23  | 1.25  | 1.21                           | 1.17  | 1.00  | 0.85  | 0.73  |
| Number of Unrestrained Passenger Vehicle Occupant Fatalities                             | C-4  | 34             | 22    | 17    | 28    | 23    | 12    | 13    | 20    | 20    | 20    | 19                             | 18    | 16    | 13    | 12    |
| Number of Fatalities Involving Driver or Motorcycle Operator w/ $\geq 0.8$ BAC           | C-5  | 27             | 29    | 19    | 25    | 21    | 20    | 15    | 21    | 15    | 19    | 18                             | 18    | 15    | 13    | 11    |
| Number of Speeding-Related Fatalities  | C-6  | 38             | 28    | 30    | 34    | 27    | 29    | 25    | 23    | 14    | 26    | 25                             | 24    | 21    | 18    | 15    |
| Number of Motorcyclist Fatalities  | C-7  | 8              | 4     | 9     | 6     | 8     | 7     | 9     | 10    | 9     | 7     | 7                              | 6     | 5     | 5     | 4     |
| Number of Unhelmeted Motorcyclist Fatalities   | C-8  | 5              | 1     | 2     | 1     | 2     | 2     | 6     | 1     | 5     | 2     | 2                              | 2     | 1     | 1     | 1     |
| Number of Drivers Age 20 or Younger Involved in Fatal Crashes                            | C-9  | 17             | 13    | 17    | 21    | 17    | 10    | 7     | 4     | 7     | 15    | 15                             | 14    | 12    | 11    | 9     |
| Number of Pedestrian Fatalities  | C-10 | 10             | 7     | 9     | 13    | 3     | 10    | 6     | 9     | 9     | 7     | 7                              | 7     | 6     | 5     | 4     |
| Number of Bicyclist Fatalities   | C-11 | 2              | 1     | 1     | 2     | 1     | 2     | 0     | 2     | 1     | 1     | 1                              | 1     | 1     | 1     | 1     |
| Percent of Observed Belt Use for Passenger Vehicles – Front Seat Outboard Occupants      | B-1  | 76.7%          | 78.4% | 83.2% | 82.4% | 84.9% | 86.1% | 86.8% | 89.3% | 88.1% | 86.1% | 87.6%                          | 89.1% | 95.0% | 95.0% | 97.5% |
| Number of Seat Belt Citations Issued During Grant-Funded Enforcement Activities (FFY)    |      |                |       |       |       |       | 4,100 | 1,726 | 1,526 | 547   | 508   | Areas tracked but no goals set |       |       |       |       |
| Number of Impaired Driving Arrests Made During Grant-Funded Enforcement Activities (FFY) |      |                |       |       |       |       | 1,896 | 1,474 | 1,330 | 783   | 250   | Areas tracked but no goals set |       |       |       |       |
| Number of Speeding Citations Issued During Grant-Funded Enforcement Activities (FFY)     |      |                |       |       |       |       | 3,376 | 1,985 | 2,067 | 1,089 | 712   | Areas tracked but no goals set |       |       |       |       |

Note: Baseline Figures are in blue.

Note: 2012 serious injury data are not available. Serious injuries are classified as major injuries in Alaska. Actual figures from 2004 to 2011 for noncitation and arrest performance measures are as shown in FFY 2014 Alaska Highway Safety Plan.

Source: Alaska Highway Safety Plan FFY2015

The following is a list of some of the key strategies identified in the 2012 STSP and 2015 HSP for continuing Alaska's movement towards zero deaths. The FAST Act continues the overarching requirements that HSIP funds be used for safety projects that are consistent with the State's SHSP. While under MAP-21, the HSIP statute listed a range of eligible HSIP projects, but this list was non-exhaustive and a State could use HSIP funds on any safety project (infrastructure-related or non-infrastructure) that met the overarching requirements. The FAST Act, however, limits HSIP eligibility to only those listed in statute—most of which are infrastructure-safety related. As a result, DOT&PF can no longer use its federal HSIP apportionment to fund education and enforcement activities.

### **Overall Fatalities**

- Ensure that crash mitigation strategies are appropriately engineered to address crash patterns involving older drivers and pedestrians/bicyclists
- Develop educational and enforcement programs to address older driver safety issues
- Implement infrastructure projects to address lane departure and intersection crashes

### **Occupant Protection**

- Continue high visibility enforcement (Click It or Ticket) programs
- Continue education and awareness efforts to promote the importance of seat belt usage
- Expand child passenger safety programs and increase booster seat usage
- Explore options to reduce punishments for child passenger safety violators who have taken steps to properly restrain their children

### **Impaired Driving**

- Prevent excessive drinking, underage drinking, and impaired driving by continuing mandatory alcohol server training and conducting publicized compliance checks of alcohol retailers to reduce sales to underage persons
- Promote responsible behavior and driving among youth with comprehensive outreach and community-based programs
- Establish an effective and consistent policy and oversight for Ignition Interlock Devices (IID) installation
- Enforce and publicize DUI laws
- Enhance enforcement in safety corridors

### **Speeding**

- Enhance enforcement of posted speed limits on safety corridors
- Market and implement Data-Driven Approaches to Crime and Traffic Safety (DDACTS), which integrates location-based traffic crash data to determine the most effective methods for positioning law enforcement

### **Motorcycle Safety**

- Continue promoting motorcycle rider education and training
- Encourage motorcyclists to use protective equipment and increase visibility

### **Novice Drivers**

- Continue educating teen drivers on critical safe driving practices, the importance of using seat belts, and sharing the road with pedestrians and bicyclists
- Enhance safe driving programs for youth drivers (such as the ThinkFast program and Project Drive clinics)

### **Pedestrian and Bicycle Safety**

- Continue outreach and education to raise awareness of pedestrian and bicyclist safety issues
- Identify and implement engineering strategies to address common crash locations involving pedestrians and bicyclists
- Expand the Safe Routes to School program (federal funding support for this program ceased in 2013 with MAP-21; DOT&PF subsequently phased out its grant program)
- Ensure that bikeways and pedestrian walkways are promptly swept following a snow event
- Improve visibility of pedestrians and bicyclists

## NEEDS ANALYSIS

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### Highways and Bridges

#### Concepts and Definitions

The state has approximately 10,600 lane miles of state owned roadway and about 700 state owned bridges. Although the state is the largest in the country in terms of area, it is 46<sup>th</sup> in terms of road miles.<sup>44</sup> The low mileage can be attributed to the fact that most people live in urbanized areas; and that extreme weather, rugged terrain, vast distances, low population density, and scattered islands make road construction difficult and very costly compared to the number of users.

Roads in Alaska are classified as being on the National Highway System, Alaska Highway System, or as Community Transportation Program roads. Bridges are classified as being on or off the National Highway System. Federal funds are targeted on the National Highway System, which includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. These roads and bridges form the core network for the state, along with AMHS vessels and many terminals that are also a part of the National Highway System. Other important roads and bridges in the state that link communities and are important for the regions of Alaska are on the Alaska Highway System, while most of the community and local roads fall under the Community Transportation Program.

#### Analysis Approach

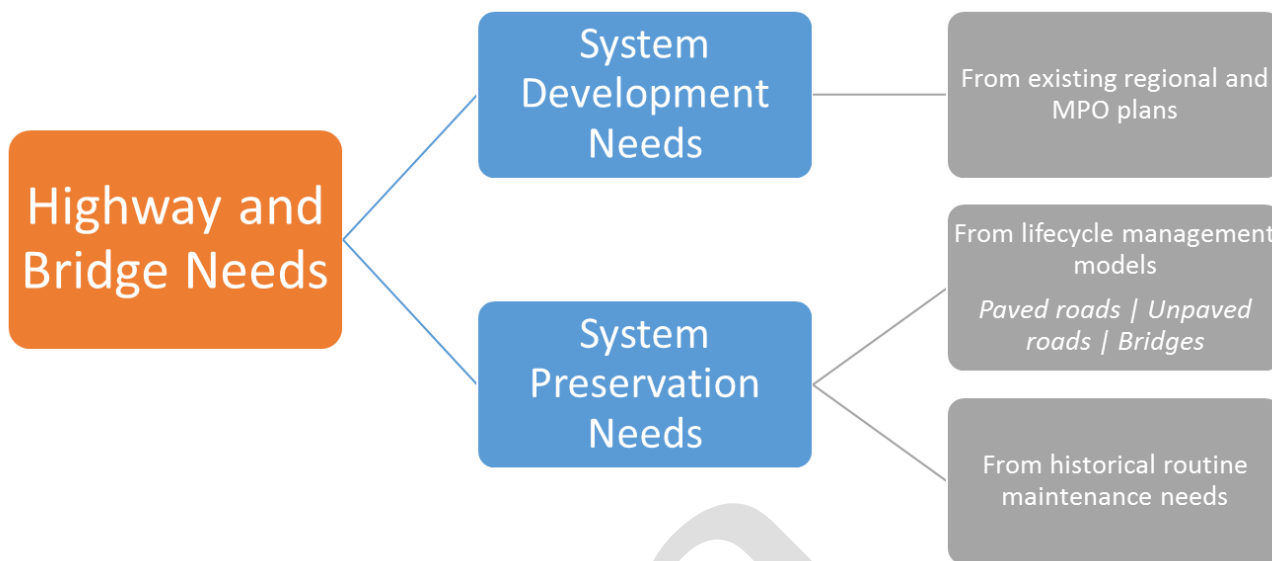
Exhibit 73 presents the analysis approach for identifying highway and bridge needs. These needs are divided into two primary categories:

1. System Development: This category captures needs for all policy areas except system preservation. This includes new facilities, modernization as well as others. These needs are calculated by identifying all system development needs from existing regional and MPO plans, reviewing the list to remove any system preservation or routine maintenance needs as well as projects that are already included in the Statewide Transportation Improvement Program (STIP).
2. System Preservation: These needs include routine maintenance and lifecycle management needs for all highways and bridges. Lifecycle management needs include activities such as rehabilitation as well as replacement, while routine maintenance includes activities such as snow and ice removal, pothole patching and mowing.

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<sup>44</sup> <https://www.fhwa.dot.gov/policyinformation/statistics/2012/hm60.cfm>

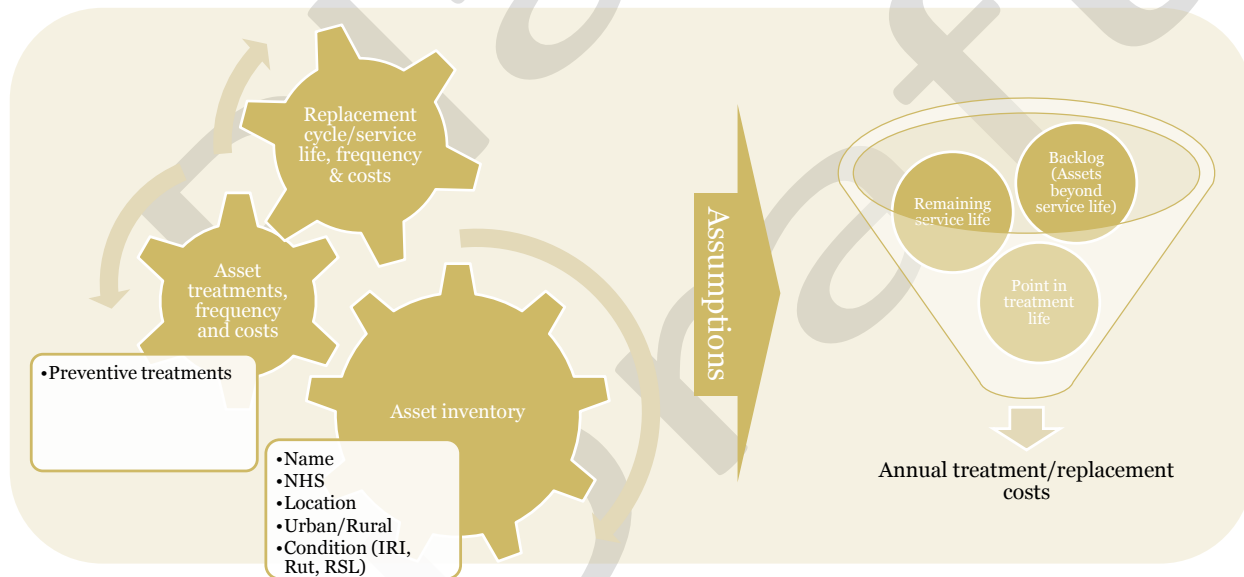
Exhibit 73: Needs Analysis Approach



**System Preservation Needs: Paved Roads**

Exhibit 74 provides an overview of the approach to identifying lifecycle management needs.

Exhibit 74: Lifecycle Management Needs Approach



The project team started with the lifecycle management model that was prepared as a part of *Let's Get Moving 2030* plan and updated the model to account for condition and roadway changes as well as changes to the treatments used by DOT&PF and their associated costs. This model utilizes Remaining



Service Life (RSL) estimates<sup>45</sup> to calculate when certain treatments are applied to the pavement. Each treatment has an associated cost based on lane miles, which is used to calculate the overall system needs, over the 23-year forecast period.

Alaska DOT&PF is currently in the process of acquiring a new Pavement Management System (PMS), and it is anticipated that the system will be able to provide more accurate inventory and condition information once implemented. This information will then be used to make decisions on treatments as well as priorities for the system. In the meantime, this current model provides a planning-level estimate of the needs for the LRTP.

#### Pavement Inventory and Condition

The project team used the 2014 HPMS submittal information as its primary source of data, combined with additional RSL estimates from the maintenance department. The condition information is calculated using International Roughness Index (IRI), rutting and cracking information using metrics proposed in the FHWA MAP-21 Performance Management Notice of Proposed Rule Making (NPRM). The metric definitions are presented in Exhibit 75 and

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<sup>45</sup> Prepared by consultants that collect condition data for Alaska DOT&PF

Exhibit 76.

Exhibit 75: Pavement Condition Thresholds

|                             | Good  | Fair              | Poor          |
|-----------------------------|-------|-------------------|---------------|
| IRI<br><i>(inches/mile)</i> | <95   | 95-170<br>95-220* | >170<br>>220* |
| Cracking<br><i>(%)</i>      | <5    | 5-10              | >10           |
| Rutting<br><i>(inches)</i>  | <0.20 | 0.20-0.40         | >0.40         |
| Faulting<br><i>(inches)</i> | <0.05 | 0.05-0.15         | >0.15         |

\*Population >1M

Plan  
Draft

Exhibit 76: Calculation of Pavement Measures

| Overall Section Condition Rating | Pavement Type   |                                     | Measures                                     |
|----------------------------------|---|-------------------------------------|--|
|                                  | Asphalt and Jointed Concrete                          | Continuous Concrete                 |  |
| Good                             | 3 metric ratings (IRI, cracking and rutting/faulting) | 2 metric ratings (IRI and cracking) | percentage of lane-miles in "Good" condition |
| Poor                             | ≥ 2 metrics rated "Poor"                              | Both metrics rated "Poor"           | percentage of lane-miles in "Poor" condition |
| Fair                             | All other combinations                                | All other combinations              |  |

Exhibit 77 indicates the number of miles owned by Alaska DOT&PF.

Exhibit 77: Number of Miles Owned by Alaska DOT&PF

|  |        |
|--|--------|
| Number of centerline miles owned by Alaska DOT&PF                | 5,593  |
| Number of centerline miles for which condition data is available | 3,700  |
| Number of lane miles*  | 10,660 |

\*Lane miles were extrapolated based on total HPMS 2014 centerline miles.

Exhibit 78 indicates the breakdown of the overall condition rating, based on HPMS 2014 data.

Exhibit 78: Condition Rating by Centerline Miles

|         | Good | Fair | Poor | Total |
|---------|------|------|------|-------|
| IRI     | 902  | 1348 | 1448 | 3698  |
| Rutting | 2102 | 1243 | 361  | 3706  |

|   | Good       | Fair        | Poor       | Total       |
|---|------------|-------------|------------|-------------|
| Cracking                                | 2326       | 535         | 846        | 3708        |
| <b>Overall Condition Rating (miles)</b> | <b>179</b> | <b>3192</b> | <b>324</b> | <b>3695</b> |
| <b>Overall Condition Rating (%)</b>     | <b>5%</b>  | <b>86%</b>  | <b>9%</b>  |             |

Treatment Cycles and Unit Cost Information

The project team worked with Alaska DOT&PF staff to identify the treatment cycles, frequencies and unit costs for each treatment. The treatments were identified separately for each region as well as urban and rural areas, given the differences in treatments, frequencies and costs. All costs mentioned include any design costs involved, but no additions (e.g., new turn lanes). Treatment cycles are presented below in Exhibit 79, Exhibit 80, and

Exhibit 81.

Exhibit 79: Northern Region Lifecycle Management Treatment Cycle

| Treatment              |       | Crack Sealing | Patching | Overlay | Crack Sealing | Patching | Rehab   |
|------------------------|-------|---------------|----------|---------|---------------|----------|---------|
| <b>Timing (Years)</b>  | Urban | 5             | 7        | 10      | 15            | 17       | 20      |
|                        | Rural | 5             | 7        | 10      | 15            | 17       | 20      |
| <b>Cost (\$/Ln-mi)</b> | Urban | 4,200         | 15,250   | 185,000 | 4,200         | 15,250   | 410,000 |
|                        | Rural | 4,200         | 15,250   | 185,000 | 4,200         | 15,250   | 410,000 |

Exhibit 80: Central Region Lifecycle Management Treatment Cycle

| Treatment              |       | Crack Sealing | Patching | Crack Sealing | Overlay | Crack Sealing | Patching | Crack Sealing | Rehab   |
|------------------------|-------|---------------|----------|---------------|---------|---------------|----------|---------------|---------|
| <b>Timing (Years)</b>  | Urban | 3             | 4        |               | 7       | 10            | 11       |               | 14      |
|                        | Rural | 3             | 5        | 8             | 10      | 13            | 15       | 18            | 20      |
| <b>Cost (\$/Ln-mi)</b> | Urban | 3,380         | 1,040    | 3,380         | 325,000 | 3,380         | 1,040    | 3,380         | 650,000 |
|                        | Rural | 3,380         | 1,040    | 3,380         | 325,000 | 3,380         | 1,040    | 3,380         | 650,000 |

Exhibit 81: Southeast Region Lifecycle Management Treatment Cycle

| Treatment       | Crack Sealing | Patching | Chip seal | Crack Sealing | Overlay | Crack Sealing | Patching | Chip seal | Crack Sealing | Rehab |         |
|-----------------|---------------|----------|-----------|---------------|---------|---------------|----------|-----------|---------------|-------|---------|
| Timing (Years)  | Urban         | 3        | 4         |               | 10      | 15            | 17       | 18        |               | 19    | 25      |
|                 | Rural         | 5        | 10        | 20            | 23      | 25            | 28       | 30        | 35            | 37    | 40      |
| Cost (\$/Ln-mi) | Urban         | 2,600    | 896       |               | 2,600   | 268,662       | 2,600    | 896       | 77,613        | 2,600 | 597,026 |
|                 | Rural         | 2,600    | 896       | 77,613        | 2,600   | 268,662       | 2,600    | 896       | 77,613        | 2,600 | 597,026 |

In addition to standard aggregate (which is used in most treatments, represented in the above treatment cycles), Alaska DOT&PF has started to use hard aggregate treatment on various roads in the Central and Southeast regions. As defined in the new hard aggregate policy, implemented on August 2, 2013, it is the policy of the department to require the use of hard aggregate in the wearing surface of high volume roadways ( $\geq 5,000$  AADT/lane) exhibiting studded-tire wear. Therefore, the team developed hard aggregate treatment cycles, timing, and costs for high volume roadways ( $\geq 5,000$  AADT/lane) in both the Central and Southeast region (shown in Exhibit 82 and Exhibit 83, respectively).

Exhibit 82: Central Region Hard Aggregate Treatment Cycle

| Treatment       | Crack Sealing | Patching | Chip seal | Crack Sealing | Overlay | Crack Sealing | Patching | Chip seal | Crack Sealing | Rehab   |
|-----------------|---------------|----------|-----------|---------------|---------|---------------|----------|-----------|---------------|---------|
| Timing (Years)  | Urban         | 4        | 5         |               | 8       | 12            | 13       |           |               | 17      |
|                 | Rural         | 4        | 6         |               | 10      | 12            | 16       |           | 22            | 24      |
| Cost (\$/Ln-mi) | Urban         | 3,380    | 1,040     |               | 3,380   | 348,034       | 3,380    | 1,040     | 3,380         | 696,069 |
|                 | Rural         | 3,380    | 1,040     |               | 3,380   | 348,034       | 3,380    | 1,040     | 3,380         | 696,069 |

Exhibit 83: Southeast Region Hard Aggregate Treatment Cycle

| Treatment       | Crack Sealing | Patching | Chip seal | Crack Sealing | Overlay | Crack Sealing | Patching | Chip seal | Crack Sealing | Rehab   |
|-----------------|---------------|----------|-----------|---------------|---------|---------------|----------|-----------|---------------|---------|
| Timing (Years)  | Urban         | 4        | 5         | 12            | 18      | 20            | 22       |           | 23            | 30      |
|                 | Rural         | 6        | 12        | 24            | 28      | 30            | 34       | 42        | 44            | 48      |
| Cost (\$/Ln-mi) | Urban         | 2,600    | 896       | 2,600         | 287,703 | 2,600         | 896      | 77,613    | 2,600         | 639,340 |
|                 | Rural         | 2,600    | 896       | 77,613        | 2,600   | 287,703       | 2,600    | 896       | 77,613        | 2,600   |

### Deterioration Methodology and Needs Analysis

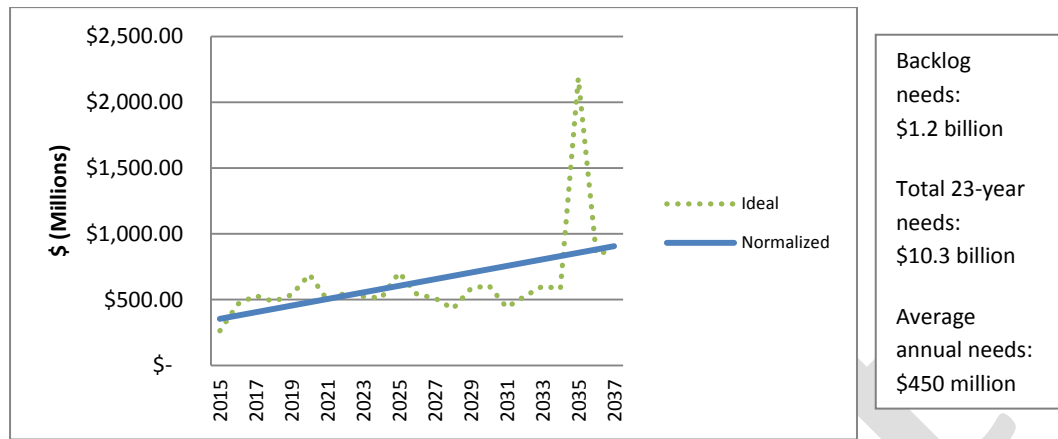
As mentioned earlier in this document, the lifecycle management needs are determined by RSL, which is assumed to decrease consistently each year. The RSL is determined as the minimum service life based on IRI and rutting information, since RSL is not calculated based on the cracking data. The calculations based on RSL indicate that 22% of the segments have an RSL of zero, and therefore are in need of immediate repair (backlog of needs). Exhibit 84 presents the RSL by each region and the statewide values.

Exhibit 84: Remaining Service Life Percentages

|            | Northern | Central | South East | State Totals |
|------------|----------|---------|------------|--------------|
| 0 Years    | 27%      | 17%     | 18%        | 22%          |
| 1-5 Years  | 22%      | 30%     | 8%         | 23%          |
| 6-10 Years | 18%      | 25%     | 11%        | 20%          |
| 11+ Years  | 33%      | 28%     | 63%        | 36%          |

Exhibit 85 presents the total needs for all paved highways owned by Alaska DOT&PF in year of expenditure dollars, both based on year-by-year calculations of the model (using a 3% inflation factor), and then normalized to calculate needs for future planning. The total 23-year need is \$10.3 billion which includes \$1.2 billion to address the backlog. The model assumes the backlog will be addressed over the first ten years of the model. The average annual need is \$450 million and includes the funding needed to address the backlog. As mentioned previously, since the new PMS has not yet been implemented, the purpose of this model is to provide only a planning-level estimate of the pavement needs for the LRTP.

Exhibit 85: Total Lifecycle Management Needs (Year of Expenditure Dollars)



**Lifecycle Management Needs: Unpaved Roads**

The project team worked with Alaska DOT&PF staff to identify mileage, treatment cycles, and unit costs for unpaved roads. The treatment cycles and costs used were the same for different system classifications and regions, and the team assumed work quantities will be evenly distributed throughout the lifecycle. Exhibit 86 identifies the treatment cycles and needs for unpaved roads.

Exhibit 86: Unpaved Road Treatment Cycles & Needs

|                  |         | Lane Miles | Surface Material (\$/ln-mi) | Dust Palliative (\$/ln-mi) | Miles Surface Material (every 10 yr) | Miles Dust (every 2 yr) | Need        |
|------------------|---------|------------|-----------------------------|----------------------------|--------------------------------------|-------------------------|-------------|
| <b>Northern</b>  | NHS     | 423        | \$8,955                     | \$4,776                    | 42                                   | 212                     | \$1,388,981 |
|                  | Non-NHS | 2714       | \$8,955                     | \$4,776                    | 271                                  | 1357                    | \$8,911,809 |
| <b>Central</b>   | Non-NHS | 760        | \$8,955                     | \$4,776                    | 76                                   | 380                     | \$2,495,569 |
| <b>Southeast</b> | Non-NHS | 166        | \$8,955                     | \$4,776                    | 17                                   | 83                      | \$545,085   |

|       |  |      |  |  |  |              |
|-------|--|------|--|--|--|--------------|
| Total |  | 4063 |  |  |  | \$13,341,445 |
|-------|--|------|--|--|--|--------------|

**Lifecycle Management Needs: Bridges**

The project team started with the previous model, which was last updated in 2010 as a part of the data refresh project by Dye Management Group, Inc.

**Inventory and Condition Data**

The team then updated the current bridge inventory and condition data with the latest information from Alaska DOT&PF's PONTIS database, which was provided by Alaska DOT&PF's staff (2014 data set). A summary of this information is presented in Exhibit 87.

The bridge condition analysis is based on whether or not a bridge is classified as structurally deficient (SD). Bridges are considered structurally deficient if significant load carrying elements are found to be in poor condition due to deterioration and/or damage. The fact that a bridge is "deficient" does not immediately imply that it is likely to collapse or that it is unsafe. However, the SD metric does alert the agency that the bridge needs significant work and, if left open to traffic, typically requires significant maintenance and repair to remain in service and eventually rehabilitation or replacement to address deficiencies. This becomes a very useful metric to the agency, when monitoring bridge safety and planning for funding improvements.

**Exhibit 87: Summary of Bridge Inventory and Structural Deficiency<sup>46</sup>**

| All Bridges & Culverts (No Ferry/Dock Bridges) |         |                      |
|--|---------|----------------------|
| Number of Bridges                              | 933     |                      |
| Total Deck Area                                | 610,978 | (Bridges & Culverts) |
| Total SD Area                                  | 64,280  |                      |
| Total SD %                                     | 11%     |                      |
| Alaska DOT&PF-Owned Bridges & Culverts         |         |                      |

<sup>46</sup> The bridge inventory numbers presented here differ from FHWA reporting since the ferry/dock/POC bridges are excluded, and the focus is on bridges that are owned by Alaska DOT&PF (excluding other state agencies).

|  |         |                      |
|--|---------|----------------------|
| Number of Bridges  | 766     |                      |
| Total Deck Area  | 541,455 | (Bridges & Culverts) |
| Total SD Area  | 51,832  |                      |
| Total SD %   | 10%     |                      |
| <b>NHS Bridges &amp; Culverts (Alaska DOT&amp;PF-Owned Only)</b> |         |                      |
| Number of Bridges  | 380     |                      |
| Total Deck Area  | 345,660 | (Bridges & Culverts) |
| Total SD Area  | 34,356  |                      |
| Total SD %   | 10%     |                      |
| <b>Alaska DOT&amp;PF-Owned Bridges Only</b>                      |         |                      |
| Number of Bridges  | 698     |                      |
| Total Deck Area  | 534,350 | (Bridges)            |
| Total SD Area  | 51,749  |                      |
| Total SD %   | 9.7%    |                      |

A comparison of number of bridges and SD condition in 2009 and 2014 is presented in Exhibit 88.

Exhibit 88: Comparison of Bridge Inventory and Structural Deficiency between 2009 and 2015

|                               | 2009    | 2015    | Change | Comments   |
|-------------------------------|---------|---------|--------|--|
| <b>Total Bridges</b>          | 704     | 698     | ↓      | Data on certain bridges was updated based on DOT&PF surveys, changing the reported deck area. Certain bridges were reported as closed. |
| <b>Total Deck Areas (sqm)</b> | 524,624 | 534,350 | ↑      |  |
| <b>Number of SD Bridges</b>   | 75      | 71      | ↓      |  |
| <b>SD Deck Area (sqm)</b>     | 46,779  | 51,749  | ↑      |  |

Unit Cost Information

The team then worked with Alaska DOT&PF staff to update the unit costs for repair and rehabilitation included in the model. The unit costs were inflated by 3% annually to account for an increase in construction costs.

The updated costs are presented in Exhibit 89.

Exhibit 89: Updated Unit Costs

| Component | Material | Unit Cost (\$/sqm of Deck) |        |
|-----------|----------|----------------------------|--------|
|           |          | Repair                     | Rehab  |
| Deck      | Conc     | 49.74                      | 390.26 |
|           | Steel    | 49.74                      | 390.26 |

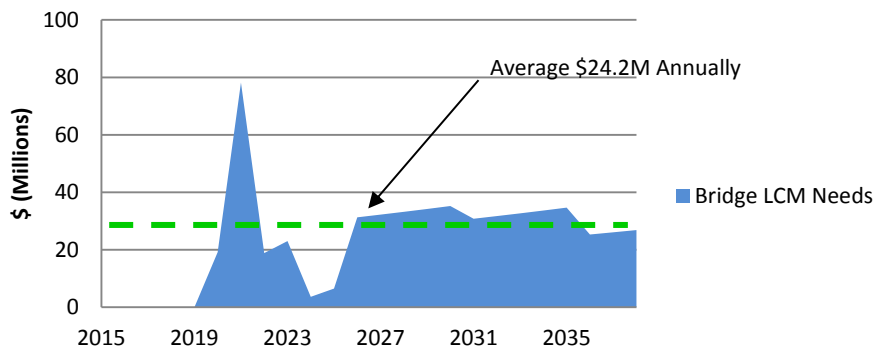


|   |       |        |                 |
|---|-------|--------|-----------------|
| Superstructure                            | Wood  | 16.58  | 139.94          |
|   | Conc  | 68.34  | 652.46          |
|   | Steel | 127.45 | 1,290.41        |
| Substructure                              | Wood  | 74.86  | 389.87          |
|   | Conc  | 50.04  | N/A             |
|   | Steel | 89.72  | N/A             |
| <b>Overall Rehabilitation/Replacement</b> | Wood  | 71.76  | N/A             |
|   |       |        | <b>4,305.57</b> |

Performance Targets

The team then discussed the performance targets for the bridges, and revised the target of no structurally deficient bridges in *Let's Get Moving 2030* to a target of no more than 10% of the deck area being structurally deficient (for both NHS and non-NHS bridges). This resulted in a significant reduction in the overall bridge needs, even after accounting for an inflationary increase in unit costs and the minor increase in overall deck area. Exhibit 90 presents the bridge needs in a graphical format.

Exhibit 90: Annual Bridge Lifecycle Management Needs (Year of Expenditure Dollars)



Performance Target Scenarios

As identified above, the performance target for bridges was revised to a target of no more than 10% of the deck area being structurally deficient (for both NHS and non-NHS bridges). This target was determined through conversations with Alaska DOT&PF Staff. However, the team ran different target scenarios, to understand the funding that would be required if Alaska DOT&PF wanted to change their target. Exhibit 91 presents three different target scenarios and accompanying needs in each scenario.

Exhibit 91: Performance Target Scenarios

|                                       | NHS        | Non NHS    | Total      |
|---------------------------------------|------------|------------|------------|
| <b>SD Target: 0 Bridges each year</b> |            |            |            |
| Current Dollars                       | 31,880,886 | 21,770,516 | 53,651,402 |
| Year of Expenditure                   | 45,968,313 | 31,890,129 | 77,858,442 |
| <b>SD Target: 5 Bridges each year</b> |            |            |            |

|   |            |            |            |
|---|------------|------------|------------|
| Current Dollars                           | 24,099,707 | 16,991,225 | 41,090,931 |
| Year of Expenditure                       | 35,271,763 | 25,078,891 | 60,350,654 |
| <b>SD Target: 10 Bridges each year</b>    |            |            |            |
| Current Dollars                           | 20,200,388 | 13,593,280 | 33,793,669 |
| Year of Expenditure                       | 29,676,300 | 20,196,571 | 49,872,871 |
| <b>SD Target: 10% Deck Area each year</b> |            |            |            |
| Current Dollars                           | 10,564,893 | 5,650,451  | 16,215,344 |
| Year of Expenditure                       | 15,640,670 | 8,587,831  | 24,228,500 |

### System Development Needs

System development needs for highway and bridges were identified by consolidating all needs identified from a number of borough/municipal and regional plans that identify project priorities for the development of the transportation system.

Since the plans were prepared between 2001 and 2015, each plan's costs were inflated to present the needs in 2014 dollars. An inflation factor of 3 percent per year was used to bring the plan costs up to 2014 dollars. These needs exclude preservation needs, which are accounted for in lifecycle needs.

Exhibit 92 below lists the regional and metropolitan plans that provide the source data for estimating system development needs. Not all plans have needs that are fully defined for all projects listed, and they are not all consistent in how needs are defined and categorized (by mode) and the time horizons that are covered. The annual needs have been calculated as the total needs defined in the plan, divided by the time horizon.

Exhibit 92: Regional and MPO Plans that Define System Development Needs

| Transportation Plan  | Year | Plan Horizon |
|--|------|--------------|
| <b>Regional Plans</b>  |      |              |
| Southeast Alaska Transportation Plan   | 2014 | 20 Years     |
| Southwest Alaska Transportation Plan   | 2014 | 20 Years     |
| Interior Alaska Transportation Plan  | 2010 | 20 Years     |
| Yukon-Kuskokwim Delta Transportation Plan                                    | 2002 | 20 Years     |
| Prince William Sound Area Transportation Plan                                | 2001 | 20 Years     |
| Northwest Alaska Transportation Plan   | 2004 | 20 Years     |
| <b>Metropolitan Plans</b>  |      |              |
| 2036 Anchorage Bowl and Chugiak-Eagle River Metropolitan Transportation Plan | 2012 | 20 Years     |
| Fairbanks Metro 2040   | 2015 | 25 Years     |
| Matanuska-Susitna Borough Capital Improvement Program: FY 2017-2022          | 2015 | 6 Years      |

### Highways

Highway needs total over \$308.2 million per year, as shown in Exhibit 93 below.

Exhibit 93: Highway System Development Needs

| Highway                           | Annual Cost, 2014 \$ <sup>*47</sup> |
|-----------------------------------|-------------------------------------|
| <b>Regional Plans</b>             |                                     |
| Southeast Alaska                  | \$45,000,000                        |
| Southwest Alaska                  | \$150,000                           |
| Interior Alaska                   | \$7,000,000                         |
| Yukon Delta                       | --                                  |
| Prince William Sound              | --                                  |
| Northwest Alaska                  | --                                  |
| <b>Regional Plan Subtotal</b>     | <b>\$52,150,000</b>                 |
| <b>Metropolitan Plans</b>         |                                     |
| Anchorage                         | \$148,000,000                       |
| Fairbanks                         | \$37,000,000                        |
| Mat-Su Borough                    | \$71,000,000                        |
| <b>Metropolitan Plan Subtotal</b> | <b>\$256,000,000</b>                |
| <b>System Development Total</b>   | <b>\$308,150,000</b>                |

*\*Excludes Preservation, which is accounted for in Lifecycle Needs*

Bridges

Bridge needs total over \$1.2 million per year (Exhibit 94).

Exhibit 94: Bridge System Development Needs

| Bridge                            | Cost, 2014 \$*     |
|-----------------------------------|--------------------|
| <b>Regional Plans</b>             |                    |
| Southeast Alaska                  | --                 |
| Southwest Alaska                  | --                 |
| Interior Alaska                   | \$700,000          |
| Yukon Delta                       | --                 |
| Prince William Sound              | --                 |
| Northwest Alaska                  | --                 |
| <b>Regional Plan Subtotal</b>     | <b>\$700,000</b>   |
| <b>Metropolitan Plans</b>         |                    |
| Anchorage                         | --                 |
| Fairbanks                         | \$544,000          |
| Mat-Su Borough                    | --                 |
| <b>Metropolitan Plan Subtotal</b> | <b>\$544,000</b>   |
| <b>System Development Total</b>   | <b>\$1,244,000</b> |

*\*Excludes Preservation, which is accounted for in Lifecycle Needs*

<sup>47</sup> The annual needs have been calculated as the total needs defined in the plan, divided by the time horizon.

### *Routine Maintenance Needs*

Current routine maintenance expenditures per lane miles were calculated based on data from the previous LRTP (2009)<sup>48</sup>. Costs were inflated from 2007 to 2015, using a 3% annual inflation rate. Routine maintenance expenditures include all activities funded through the General Fund, which includes (but not limited to) snow and ice removal, pothole patching, minor crack sealing, striping, cleaning culverts, mowing and sign repair. A total number of routine maintenance is presented here, instead of a detailed breakdown, since the planning-level estimate is not based on any specific detailed routine maintenance data. The annual routine maintenance needs for both highways and bridges are estimated to be \$132 million, up from \$104 million estimate in *Let's Get Moving 2030*.

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<sup>48</sup> *Let's Get Moving 2030* estimated the maintenance needs using the conservative assumption that bringing the maintenance budget back up to its 1983 level adjusted for CPI measured inflation (1983 was reported by maintenance staff as the year in which the maintenance funding met its needs) will help meet ADOT&PF's routine maintenance needs. This increase should be considered a conservative estimate since the number of lane miles, maintenance costs, and other factors have driven up costs to maintain highways and bridges over time.

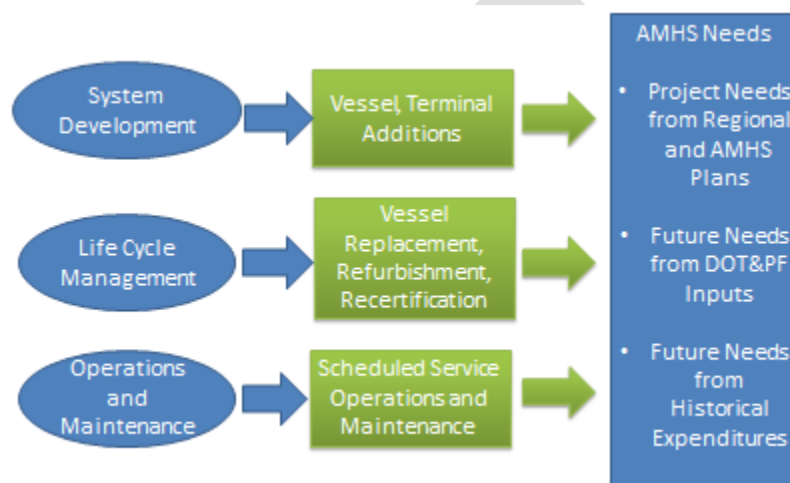
## Marine Highway System

### Concepts and Definitions

The Alaska Marine Highway System (AMHS) provides marine transportation services to connect Alaska's coastal communities and is an integral part of the State transportation infrastructure. It is currently the only marine route recognized as a National Scenic Byway and All-American Road. The AMHS system stretches across approximately 3,500 miles of coastline and provides service to 35 communities.

While the needs analysis process, presented in this section and illustrated in Exhibit 95, focuses on the AMHS, it also includes non-State operated ferry services, including the Inter-Island Ferry Authority (operated in Southeast Alaska), North End Ferry Authority (operated in Southeast Alaska), Ketchikan International Airport ferry service, and Seldovia Bay M/V *Kachemak Voyager*. Together, the State and independent ferry services form an important component of the state's transportation system, serving communities in Southeast Alaska, Prince William Sound, Kodiak Island, and the eastern Aleutian Islands.

Exhibit 95: AMHS Needs Analysis Process



### Current Conditions

#### *The Unique Mission of the Alaska Marine Highway System*

The mission of the AMHS was and remains a means to connect the communities off the road system to Alaska's highways. Most of the connections made by AMHS, such as Homer to Kodiak and the communities of the eastern Aleutians, are to places too small to attract a for-profit ferry operation. Given its mission, the challenge to the AMHS is how to provide reasonable levels of service at a cost the state can afford.

The ferry system has included a significant number of trips by residents between Southeast, Prince William Sound, and Southwest communities. Ferry service in Alaska provides several socioeconomic benefits, including:

- **Reducing the cost of living** for residents of communities served by ferries. Ferries provide residents of smaller communities with access to lower-priced goods and services that are available in other larger, nearby communities.
- **Increasing employment, total spending, and result in a return on investment**, according to an analysis of the AMHS system published in January 2016:<sup>49</sup>
  - The AMHS' employment and spending resulted in 1,700 Alaska jobs (\$103.7 million in wages) in 2014, including 1,017 direct jobs (\$65.0 million in wages) and 683 indirect jobs (\$38.7 million in wages).
  - The AMHS' economic activity resulted in total spending of \$273.0 million in 2014, including \$184.7 million in direct spending and \$88.3 million in indirect spending.
  - The State of Alaska's General Fund investment of \$117 million resulted in a total return on investment of \$273 million, a return of more than 2-to-1.
  - The AMHS plays an important role in the State's tourism sector. The AMHS carries over 100,000 non-resident passengers annually.

However, improvements to air travel combined with increases in AMHS fares over time and stable populations in the communities served has made it challenging for the AMHS to significantly increase ridership and revenues from resident travel. In addition, the Southeast AMHS routes face service constraints when traveling through Peril Straight and Wrangell Narrows, since ferries can only travel through these narrows at high tide and low current velocities. AMHS has also faced challenges with competing with the cruise ship industry. The cruise ship industry has marketed Southeast Alaska cruises heavily, increased the number of sailings, significantly increased the size of individual ships, and sold lower cost cruises at rates that are competitive and sometimes less expensive than AMHS fares. The competition has made it difficult for AMHS, with its limited marketing budget, to increase trips made by visitors.

### *Existing Alaska Ferry Systems*

The DOT&PF operates and maintains the AMHS system, which includes ferries and ferry terminals. AMHS vessels visit 35 port facilities, of which approximately half are owned by the State. Since most of the communities served by the ferry system are not connected to the highway system, the AMHS is a critical element of Alaska's transportation system. The AMHS is considered a part of Alaska's highway system, providing connections to communities throughout Southwest, Southcentral, and Southeast Alaska, as illustrated in Exhibit 96, Exhibit 97, and Exhibit 98.

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<sup>49</sup> [http://dot.alaska.gov/amhs/doc/reports/econ\\_15.pdf](http://dot.alaska.gov/amhs/doc/reports/econ_15.pdf)

Exhibit 96: Southwest Alaska Ferry Routes

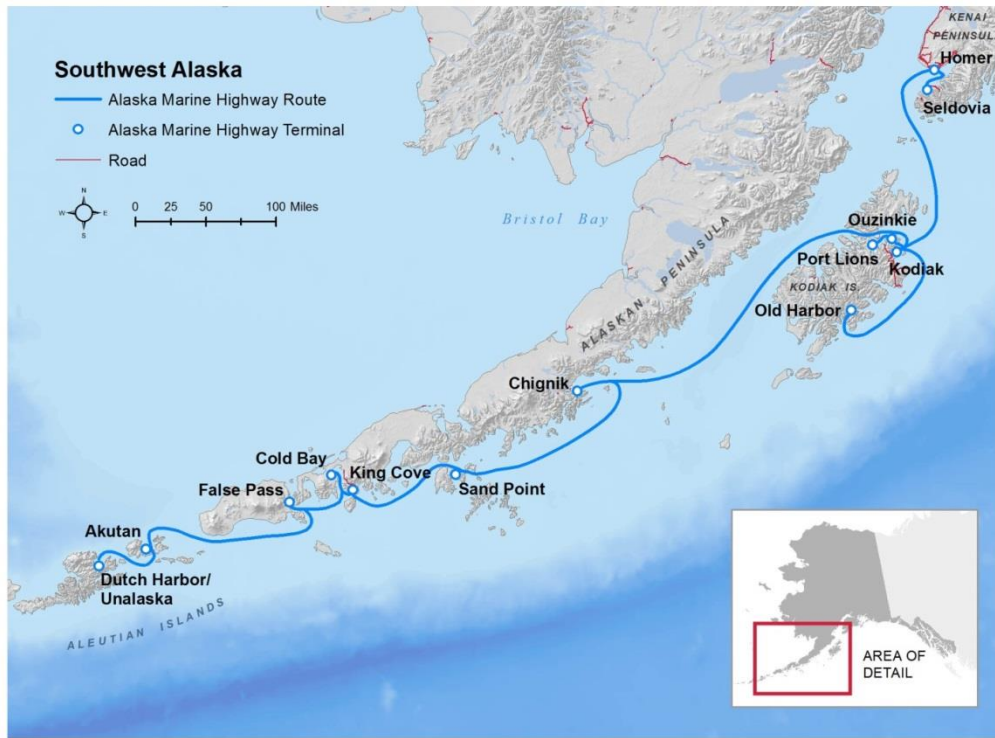


Exhibit 97: Southcentral Alaska Ferry Routes

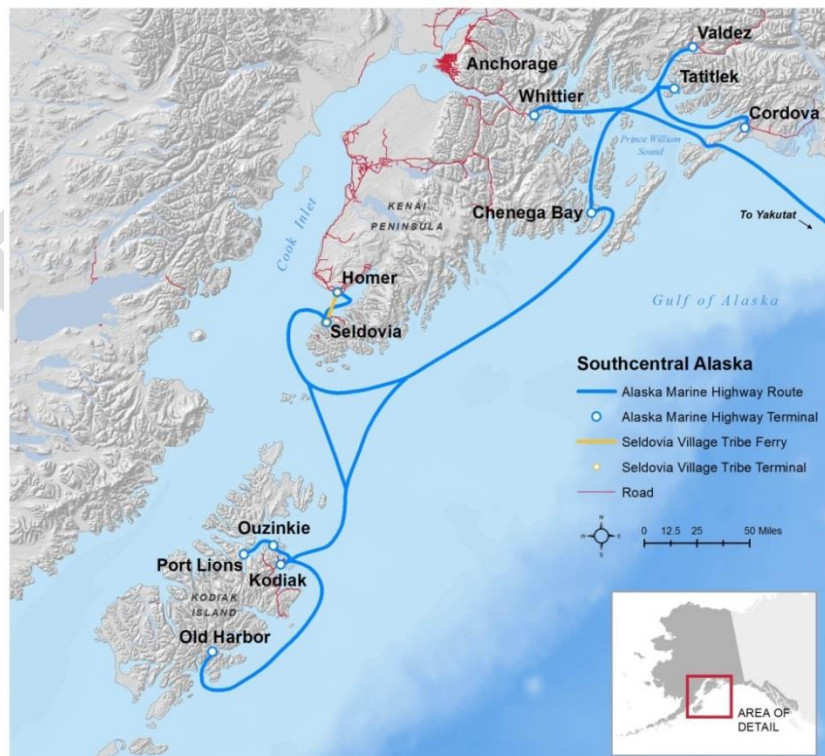
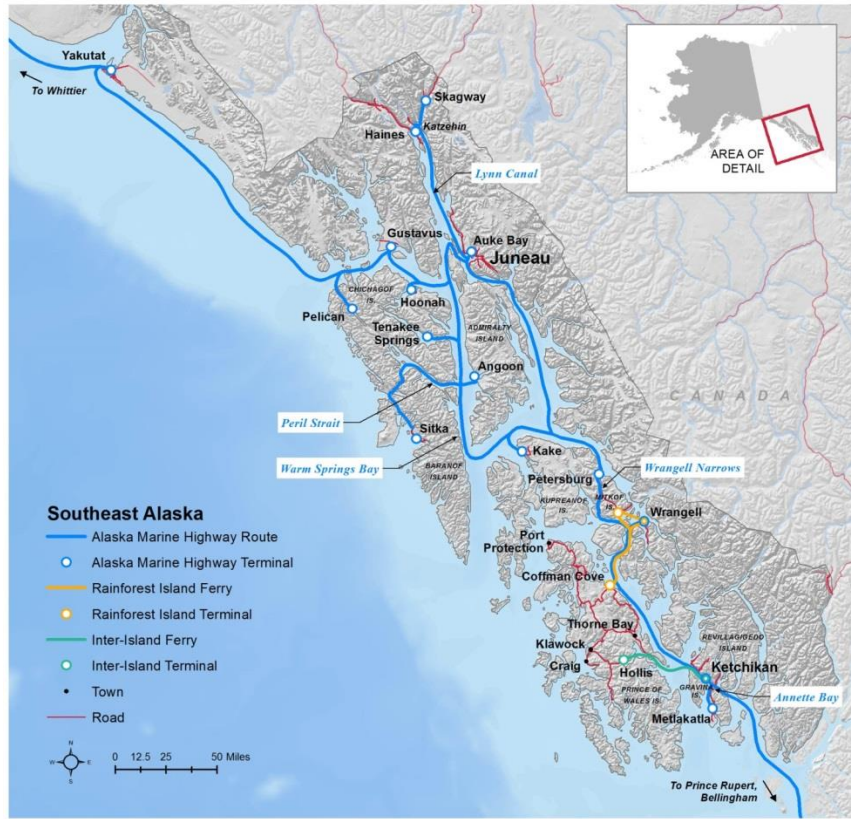




Exhibit 98: Southeast Alaska Ferry Routes



### Ferry Management and Operations

Most of the ferries are managed and operated by the State via the AMHS. However, some ferries are owned and operated by local government or privately, as discussed later in this section.

### Communities Served

The AMHS serves 35 communities, most of which are located in Alaska and some outside of Alaska, including Bellingham, Washington and Prince Rupert, British Columbia. The AMHS ports of call are listed in Exhibit 99. Seven AMHS ports of call provide a direct connection to the surface highway system (i.e., Whittier, Valdez, Haines, Skagway, Bellingham [Washington], Prince Rupert [British Columbia], and Homer). All other communities listed are not connected to the national highway system via a surface roadway.

Exhibit 99: AMHS Ports of Call

| Code | Community   | Code | Community  |
|------|-------------|------|------------|
| ANB  | Annette Bay | OLD  | Old Harbor |
| AKU  | Akutan      | ORI  | Port Lions |



| Code | Community         | Code | Community             |
|------|-------------------|------|-----------------------|
| ANG  | Angoon            | OUZ  | Ouzinkie              |
| BEL  | Bellingham, WA    | PEL  | Pelican               |
| CBY  | Cold Bay          | PSG  | Petersburg            |
| CDV  | Cordova           | SDP  | Sand Point            |
| CHB  | Chenega Bay       | SDV  | Seldovia              |
| CHG  | Chignik           | SGY  | Skagway               |
| FPS  | False Pass        | SIT  | Sitka                 |
| GUS  | Gustavus          | TAT  | Tatitlek              |
| HNS  | Haines            | TKE  | Tenakee               |
| HNH  | Hoonah            | UNA  | Unalaska/Dutch Harbor |
| HOM  | Homer             | VDZ  | Valdez                |
| JNU  | Juneau (Auke Bay) | WRG  | Wrangell              |
| KAE  | Kake              | WTR  | Whittier              |
| KCV  | King Cove         | YAK  | Yakutat               |
| KOD  | Kodiak            | YPR  | Prince Rupert, BC     |
| KTN  | Ketchikan         |      |                       |

### Types of Service

AMHS provides year-round and seasonally-scheduled ferry service. However, the AMHS ferry schedules vary somewhat each year, based on available funding levels and operating budgets. The DOT&PF prepares an operating plan that is designed to meet the essential needs for community service, but stays within available funding and maintaining regulatory and safety standards for the vessels. Since vessel maintenance occurs during the fall, winter, and spring months and usually requires at least six weeks per vessel, fewer vessels are scheduled in service during these times of year due to lower demand. Vessels not needed to meet the off-season schedules, but not undergoing maintenance, are placed in lay-up status.

The three types of service provided by the AMHS are presented in Exhibit 100.

Exhibit 100: AMHS Vessels and Service

| Service Type                         | Description  | Vessels  |
|--------------------------------------|--|--|
| Mainline circuit                     | These marine vessels, the largest ships in the fleet, are characterized by their amenities and larger carrying capacity to accommodate the traveling public, semi-trailers, large trucks, and heavy equipment. During the operating season, the vessels operate 24/7 with crew cabins. While these vessels typically service the larger communities, some of the mainline routes also serve the smaller communities (i.e., Kake, Hoonah) during certain mainline sailings. | M/V Columbia<br>M/V Kennicott<br>M/V Malaspina<br>M/V Matanuska<br>M/V Taku<br>M/V Tustumena |
| LeConte Class/Day Boat               | Designed to provide public transportation to smaller communities and fill in for mainliners when required and where possible.  | M/V Aurora<br>M/V LeConte  |
| Shuttle/ Feeder ferries <sup>1</sup> | These marine vessels are home ported in one community, make trips between two or three communities within a day, and return each night for overnight moorage. These shorter routes generally serve smaller communities, such as those in Prince William Sound and Hoonah and Kake in Southeast Alaska.   | Chenega<br>Fairweather<br>M/V Lituya   |

<sup>1</sup> While not an AMHS vessel, the Inter-Island Ferry Authority's (IFA) M/V Prince of Wales also provides this type of shuttle service.

### Fleet

The AMHS fleet consists of eleven vessels, which includes six mainline ferries and five feeder ferries (two of which are fast ferries). All AMHS vessels are designed to carry both passengers and vehicles, although carrying capacity varies among the vessels, as described in Exhibit 101.

The AMHS fleet is aging; four of the vessels are more than 50 years old and nearing the end of their useful life. Maintenance costs are likely to increase significantly as the vessels get older.

Exhibit 101: AMHS Vessels and Generic Routes

| Vessel           | Vessel Class | Service Area/Route Description   | Year Commissioned | Age | Vessel Description  |
|------------------|--------------|--|-------------------|-----|---|
| M/V Aurora (AUR) | Feeder       | Prince William Sound, Southeast Alaska (in relief of the M/V LeConte). | 1977              | 39  | The <i>Aurora</i> is designed to carry 300 passengers and has a vehicle capacity of 680 linear feet (equal to approximately 34 twenty-foot vehicles). |

| Vessel                | Vessel Class                  | Service Area/Route Description  | Year Commissioned | Age | Vessel Description  |
|-----------------------|-------------------------------|---|-------------------|-----|---|
| M/V Chenega (CHE)     | Feeder/Shuttle ("Fast Ferry") | Prince William Sound and Southeast Alaska   | 2005              | 11  | The <i>Chenega</i> is designed to carry 250 passengers and has a vehicle capacity of 720 linear feet (equal to approximately 36 twenty-foot vehicles).  |
| M/V Columbia (COL)    | Mainline                      | Skagway, Alaska and Bellingham, Washington with stops in various Southeast communities                            | 1974              | 42  | The <i>Columbia</i> is the largest vessel in the AMHS fleet. The vessel is designed to carry 499 passengers and has a vehicle capacity of 2,680 linear feet (equal to approximately 134 twenty-foot vehicles).                            |
| M/V Fairweather (FWX) | Feeder/Shuttle ("Fast Ferry") | Southeast Alaska in the northern part of the Panhandle, as well as assisting in Prince William Sound on occasion. | 2004              | 12  | The <i>Fairweather</i> is designed to carry 250 passengers and has a vehicle capacity of 720 linear feet (equal to approximately 36 twenty-foot vehicles).  |
| M/V Kennicott (KEN)   | Mainline                      | Southeast to Southwest Alaska, including Prince William Sound   | 1998              | 18  | The <i>Kennicott</i> is designed to carry 499 passengers with a vehicle capacity of 1,200 to 1,600 linear feet (equal to 60 to 80 twenty-foot vehicles).  |
| M/V LeConte (LEC)     | Feeder                        | Northern Southeast Panhandle  | 1974              | 42  | The <i>LeConte</i> is designed to carry 247 passengers and has a vehicle capacity of 680 linear feet (equal to approximately 34 twenty-foot vehicles).  |
| M/V Lituya (LIT)      | Local/Shuttle                 | Annette Bay (Metlakatla) and Ketchikan  | 2004              | 12  | The <i>Lituya</i> is the smallest vessel in the fleet and the only ferry dedicated to a single route. <i>Lituya</i> is designed to carry 149 passengers and has a vehicle capacity of 360 linear feet (equal to 18 twenty foot vehicles). |

| Vessel              | Vessel Class | Service Area/Route Description  | Year Commissioned | Age | Vessel Description   |
|---------------------|--------------|---|-------------------|-----|--|
| M/V Malaspina (MAL) | Mainline     | Bellingham, WA and Skagway, AK  | 1963              | 53  | The <i>Malaspina</i> is designed to carry 499 passengers with a vehicle capacity of 1,760 linear feet (equal to approximately 88 twenty-foot vehicles). The vessel is not SOLAS certified (Safety of Life At Sea, an international treaty) so it is unable to call in Prince Rupert, BC. |
| M/V Matanuska (MAT) | Mainline     | Bellingham, WA and Skagway, AK, including Prince Rupert, BC               | 1963              | 53  | The <i>Matanuska</i> is SOLAS certified and designed to carry 499 passengers and has a vehicle capacity of 1,760 feet (approximately 88 twenty-foot vehicles).   |
| M/V Taku (TAK)      | Mainline     | As of June 2015, the <i>Taku</i> is in "lay-up" status and out-of-service | 1963              | 53  | The vessel is designed to carry 370 passengers and has a vehicle capacity of 1,380 linear feet (equal to 69 twenty-foot vehicles).   |
| M/V Tustumena (TUS) | Mainline     | Southwest Alaska  | 1964              | 52  | The <i>Tustumena</i> is the smallest AMHS mainline vessel and is one of only two certified ocean class ferries in the fleet. The vessel is designed to carry 174 passengers and has a vehicle capacity of 720 linear feet (equal to 36 twenty-foot vehicles).                            |

Note: M/V Tustumena and M/V Kennicott are the only two ferries capable of serving the eastern Aleutians as they are the only ferries designed for open ocean use. In addition, the ferry docks located in Southwest Alaska experience high tidal ranges, exposed locations, and severe weather conditions, which requires unique design elements of a ferry. The Tustumena is scheduled to be replaced. A Reconnaissance Report prepared in 2014 details the vessel requirements and needs for handling such conditions.

### Other Ferry System Operators

Non-State operated ferry services are described below due to their importance to transportation in Alaska; however, they are not included in the needs analysis since the DOT&PF does not manage, operate, or fund these systems.

- The **Inter-Island Ferry Authority (IFA)** was formed in 1997 (with service beginning in 2002) to improve transportation to Prince of Wales Island communities in southern Southeast Alaska. The IFA fleet consists of two roll on/roll off passenger car ferries, the *M/V Prince of Wales* and the *M/V Stikine*. As of 2014, the IFA operates only one route between Ketchikan and Hollis, but also fills in on the Annette Bay to Ketchikan service when the *M/V Lituya* is out of service.
- The **North End Ferry Authority** is a new ferry authority providing passenger and vehicle service beginning in 2015 to Wrangell, Petersburg (via S. Mitkof ferry terminal), and Prince of Wales Island (via Coffman Cove ferry terminal). The North End Ferry Authority operates the *M/V Rainforest Islander*, a 65-foot long landing craft.
- The **Ketchikan Gateway Borough's Transportation Services Department** owns and operates the Airport Ferry System service between Gravina Island and Revillagigedo Island. The Ketchikan International Airport is located on Gravina Island, while the community of Ketchikan is located on Revillagigedo Island. The Ketchikan Gateway Borough owns two vessels: one which was built in 2013 (*M/V Ken Eichner*) and the other in 2001 (*M/V Oral Freeman*).
- The **Seldovia Village Tribe** operates the Seldovia Bay *M/V Kachemak Voyager* between Seldovia and Homer during the summer months. The vessel carries light freight and up to 150 passengers. The vessel was purchased and the service initiated by the Tribe as an economic development project for the benefit of the community of Seldovia.

### *Current Challenges in Providing Ferry Service in Alaska*

The AMHS is currently facing the following challenges:

- **Aging fleet:** As mentioned earlier in this report, four of the 11 AMHS vessels were built more than 50 years ago. To combat costs associated with maintaining old vessels, new vessels (e.g., the Alaska Class Ferries) are being designed and built. The new vessels will have smaller crews and may have better fuel efficiency.
- **Funding availability:** Uncertain future federal transportation funding and declining state oil revenues (which fund most of the state operating budget), combined with increases in the costs of operation, create concern about the State's ability to continue to fund the ferry system's current levels of service. State and Federal support cover approximately 70% of the system's annual expenditures.
- **Operating and maintenance costs:** Operating and maintenance costs include expenses such as labor, fuel, and maintenance. Both labor and fuel costs have grown over recent years, although the recent decline in oil prices may provide some relief. For FY2014 (ending June 30, 2014), of the \$166.0 million spent in operating expenditures, marine fuel accounted for about 20%, and labor accounted for nearly two-thirds of AMHS operating funds. Similarly, the FY2015 operating budget includes 18% for fuel and 69% for marine vessel operations.
- An AMHS rate study prepared in 2008 cited that **personnel costs and fuel prices as drastically increasing AMHS service costs.**

## Ferry Ridership

The AMHS prepares annual traffic volume reports, which includes a breakdown by Southwest and Southeast Alaska traffic. While overall AMHS ridership is lower than its peak of more than 420,000 passengers in 1992, the number of ferries in service has increased since then. In the early 1990s, there were eight ferries in the fleet; as of 2015, there are 11 ferries (Exhibit 102). 2014 research for the *Southeast Alaska Transportation Plan* indicated that it may be possible for the AMHS to continue successfully without replacing all of the three mainliners in Southeast Alaska that will need to retire in the next decade.

Exhibit 102: AMHS Historic Annual Traffic Trends, 1992-2014

| Year | Vehicles | Passengers |
|------|----------|------------|
| 1992 | 112,895  | 420,436    |
| 1998 | 100,818  | 351,413    |
| 2003 | 90,972   | 297,965    |
| 2008 | 109,839  | 340,412    |
| 2012 | 115,448  | 337,774    |
| 2014 | 108,478  | 319,004    |

Source: 2014 AMHS Annual Traffic Volume Report.  
[http://www.dot.state.ak.us/amhs/doc/reports/atvr\\_14.pdf](http://www.dot.state.ak.us/amhs/doc/reports/atvr_14.pdf)

Within the past few decades, there have been sporadic three to six year cycles in which AMHS traffic steadily increased or decreased from the prior year. For passenger traffic, a six-year period of decreased ridership occurred between 2000 and 2005. A five-year period of reduced vehicle traffic occurred between 1993 and 1997, and a six-year period occurred between 2000 and 2005.

AMHS found itself in a difficult position with escalating service costs and declining ridership in the early to mid-2000s. To grow ridership and revenues, in late 2005, the AMHS instituted targeted pricing discounts. This, along with introduction of the fast ferries, increased ridership and revenue during the subsequent years, as indicated in the annual percentage increases during 2006 through 2008.

The *Alaska Marine Highway System Analysis* (2011) cites the introduction of the *M/V Fairweather* and *M/V Chenega* in 2006, in combination with changes to the operating profile and marketing initiatives described earlier, as contributing factors in reversing the ridership decline. The analysis also noted that the majority of growth in recent years has occurred on the lower-revenue Prince William Sound and Metlakatla runs.

## Future Characteristics

This section presents the expected future characteristics of the AMHS, including the unique mission of the AMHS, challenges to long-term ferry operations, and potential strategies to improve the AMHS.

### *Upcoming Fleet Additions: Alaska Class Ferry and Tustumena Replacement Projects*

A new generation of vessels is being planned for the AMHS fleet since a number of the aging vessels will need to be retired. In 2012, Governor Sean Parnell directed the development of two Alaska Class ferries, so that these ferries can enter service with the retirement of three of the original mainline ferries. In 2014, then Governor Parnell announced that DOT&PF and Vigor Industrial had reached a final agreement to construct two Day Boat Alaska Class Ferries at Vigor Ketchikan Shipyard. The vessels are scheduled for delivery in 2018.

These new Alaska Class Ferries would generally have the capability to replace the Malaspina, serving as a shuttle ferry operating in Lynn Canal between Juneau, Haines, and Skagway. The vessels are currently being designed to have stern and bow loading (roll on-roll off) capabilities, will be 280 feet long, accommodate up to 300 passengers, and carry 53 standard vehicles. A *Design Concept Report* was prepared for the DOT&PF in 2013, detailing requirements for these vessels including ferry system operational requirements, major design decisions, and concept vessel designs.

The DOT&PF is currently in the process of designing the *Tustumena* replacement vessel. The *Tustumena* is one of two ocean class vessels in the AMHS fleet and is the only vessel capable of serving all ports between Homer and Unalaska/Dutch Harbor. A reconnaissance report was completed in March 2014, and design study report was completed in Fall 2014, with the final design completed in January 2016.<sup>50</sup>

### *Challenges to Long-term / Future Ferry Operations in Alaska*

The AMHS faces several operating challenges that are met with an equally challenging financial environment—ship replacement needs, volatile fuel prices, wage increases, static markets, declining revenues, and the difficulty of imposing significant tariff increases for ferry dependent communities result in a growing State subsidy.<sup>51</sup> In addition, over the next 20 years, the Alaska Department of Labor and Workforce Development is projecting population declines in most of coastal Alaska.

One of the greatest challenges and limitations for the AMHS is to maintain revenue growth at a rate commensurate with the growth in costs. DOT&PF data indicates although all routes generate revenue, the revenue is insufficient to cover the total AMHS expenses. In 2012, the Commissioner of the DOT&PF stated that while the AMHS will continue to require ongoing state fiscal support to provide ferry service,

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<sup>50</sup> Reconnaissance Report: [http://www.dot.state.ak.us/amhs/tusty\\_replace/documents/recon\\_report\\_031214.pdf](http://www.dot.state.ak.us/amhs/tusty_replace/documents/recon_report_031214.pdf)  
Design Study Report: [http://www.dot.state.ak.us/amhs/tusty\\_replace/documents/design\\_study\\_112114.pdf](http://www.dot.state.ak.us/amhs/tusty_replace/documents/design_study_112114.pdf)

<sup>51</sup> 2011 Alaska Marine Highway System Analysis:  
[http://www.dot.state.ak.us/amhs/doc/reports/system\\_analysis.pdf](http://www.dot.state.ak.us/amhs/doc/reports/system_analysis.pdf)

the AMHS staff continues to work to find efficiencies within the system to reduce operating costs. Since fiscal year 2011, AMHS has had some success controlling costs. The operating ratio (ratio of operating revenue to operating expenses) in FY2011 was 0.301, and with the emphasis on controlling costs, increased in FY2015 to 0.335.

The volatility of fuel prices presents a challenge while planning for AMHS funding. For instance, fuel represented 20% of AMHS authorized spending in FY2009 and was budgeted at \$41 million, but with the recession and dramatic decline in oil prices, actual expenditures totaled only \$28 million. The price per gallon ranged generally between \$1 - \$2 for a 20-year period, hitting \$2 per gallon in 2005, and a high of \$3 per gallon in March 2008. Four months later the price per gallon spiked to more than \$4 per gallon and then plunged to \$2 per gallon six months later. The well-known volatility in global oil prices reinforces the difficulty in budget forecasting for an organization like AMHS that uses a significant volume of fuel.

Labor costs make up the greatest portion of the AMHS budget. Employee salaries, wages and benefits comprised 47% of the FY2009 budget (\$74.0 million). The Alaska budget calls for 724 full-time positions and 128 part-time and nonpermanent positions for vessel operations.

While the Fixing America's Surface Transportation (FAST) Act authorized funding for five years, providing funding stability, the current and forecast levels of funding are still lower than those required to meet all identified needs. Consequently, the DOT&PF must plan for the possibility of reduced financial resources.

## Needs

The ability for the State to meet AMHS needs is constrained by state and federal funding appropriations. Of the amounts allocated under the Fixing America's Transportation Act (FAST) ferry formula (which must be used for construction or improvements to ferries or ferry terminal facilities):

1. 35 percent shall be allocated among eligible entities in the proportion that:
  - (A) the number of ferry passengers, including passengers in vehicles, carried by each ferry system in the most recent calendar year for which data is available; bears to
  - (B) the number of ferry passengers, including passengers in vehicles, carried by all ferry systems in the most recent calendar year for which data is available;
2. 35 percent shall be allocated among eligible entities in the proportion that:
  - (A) the number of vehicles carried by each ferry system in the most recent calendar year for which data is available; bears to
  - (B) the number of vehicles carried by all ferry systems in the most recent calendar year for which data is available; and
3. 30 percent shall be allocated among eligible entities in the proportion that:
  - (A) the total route nautical miles serviced by each ferry system in the most recent calendar year for which data is available; bears to



- (B) the total route nautical miles serviced by all ferry systems in the most recent calendar year for which data is available.

### System Development Needs

AMHS system development needs include vessel additions, terminal additions, and replacements. This needs analysis included DOT&PF-owned vessels and terminals as well as associated replacement, routine operations, and maintenance costs. The following needs were determined by reviewing regional plans and the 2016-2019 STIP. Large capital needs for vessel replacements are discussed in the following subsection (*Life Cycle Management Needs*).

The 2014 Southeast Alaska Transportation Plan mentions that adding smaller, point-to-point ferries to the fleet may increase service capacity and lower operating costs for dayboats. In addition, modifying terminal facilities at Haines and Skagway to provide end-loading capability in addition to the existing side load capability may also help expand service capacity.

In addition to STIP needs, the following system development needs illustrated in Exhibit 103 were developed based on projects listed in the regional and metropolitan plans. AMHS needs total over \$66 million per year.

Exhibit 103: AMHS System Development Needs

| Document                          | Cost, 2014 \$*      |
|-----------------------------------|---------------------|
| <b>Regional Plans</b>             |                     |
| Southeast Alaska                  | \$23,000,000        |
| Southwest Alaska                  | --                  |
| Interior Alaska                   | --                  |
| Yukon Delta                       | --                  |
| Prince William Sound              | \$7,000,000         |
| Northwest Alaska                  | --                  |
| <b>Regional Plan Subtotal</b>     | <b>\$30,000,000</b> |
| <b>Metropolitan Plans</b>         |                     |
| Anchorage                         | --                  |
| Fairbanks                         | --                  |
| Mat-Su Borough                    | \$36,000,000        |
| <b>Metropolitan Plan Subtotal</b> | <b>\$36,000,000</b> |
| <b>System Development Total</b>   | <b>\$66,000,000</b> |

\*Excludes Preservation, which is accounted for in Lifecycle Needs

### Life Cycle Management Needs

The life cycle management needs for AMHS are composed of vessel replacements and vessel refurbishment/recertification. AMHS vessel refurbishment and recertification needs are based on

information provided in regional transportation plans, the 2006 AMHS fleet survey, and the 2016-2019 STIP. Life cycle management needs total \$598.6 million and is discussed in more detail below.

#### *Vessel Replacements*

Vessel replacement needs include those listed in the most recent AMHS fleet survey.<sup>52</sup> This fleet survey detailed the conditions of each vessel, and explained the life expectancy and major maintenance cycles for these vessels. An update of the vessel survey is included in the 2016-2019 STIP.

The *2014 Southeast Alaska Transportation Plan* has identified the following fleet replacements/options:

- Replace/retire the three mainliners in service since 1963 (M/V *Malaspina*, *Taku*, and *Matanuska*) (Design, \$10 million).
- Construct a new mainliner as a replacement for two of the aging mainliners; add a second new mainliner if traffic demand warrants and sufficient funding is available (\$226.5 million).
- Construct a new fast ferry or conventional ferry (similar to the Alaska Class Ferry) as a replacement for one of the existing fast ferries (Design \$2 million, Construction \$85 million).

The *Southwest Alaska Transportation Plan Update Phase 1 Report* (2014) and the 2016-2019 STIP both identified constructing a replacement for the M/V *Tustumena* to service Southcentral and Southwest Alaska coastal communities (\$0 in 2016-2019 STIP but estimated to cost approximately \$237 million).<sup>53</sup>

These plans do not account for the eventual need to replace M/V *Aurora* (now 39 years old), M/V *Columbia* (now 42 years old) and M/V *LeConte* (now 42 years old). These vessels will be at almost the same age as that of the three mainliners now that are planned to be replaced in the near future. It is difficult to estimate a future replacement value, since these vessels may not be replaced in-kind depending on future traffic patterns.

#### *Vessel Refurbishments and Recertifications*

Vessel refurbishment and recertification includes necessary activities for keeping vessels safe and compliant with Safety of Life At Sea (SOLAS) standards. In addition, refurbishments are essential for keeping vessels attractive to consumers for transportation needs. Refurbishment activities include engine overhauls, hull repair/replacement, upgrades to vessel interiors, and overhauls to miscellaneous equipment. Refurbishment activities specific to safety include installation of Automated Ship Identification Systems (AIS), Voyage Data Recorders (VDRs), and fixed Local Area Fire Fighting (LAFF) systems.

Ferry refurbishment is included in the 2016-2019 STIP, and includes annual ferry refurbishment, regulatory driven activities, and dry docking (\$1.5 million in FFY16, \$6.1 million in FFY17, \$10.5 million in

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<sup>52</sup> Conducted by the Glostien Associates, 2006.

<sup>53</sup> DOWL HKM. *2014 Southwest Alaska Transportation Plan Update, Phase 1 Report: Understanding the Transportation System and Regional Needs*. Prepared for DOT&PF. Appendix E. Public Involvement. Retrieved 10/20/2014 at: [http://www.dowlhkm.com/projects/SWAKTP/new\\_website/documents.html#](http://www.dowlhkm.com/projects/SWAKTP/new_website/documents.html#)

FFY18, and \$20 million in FFY19). Refurbishment priorities would be established based on the updated AMHS fleet survey report.

### *Routine Operations and Maintenance Needs*

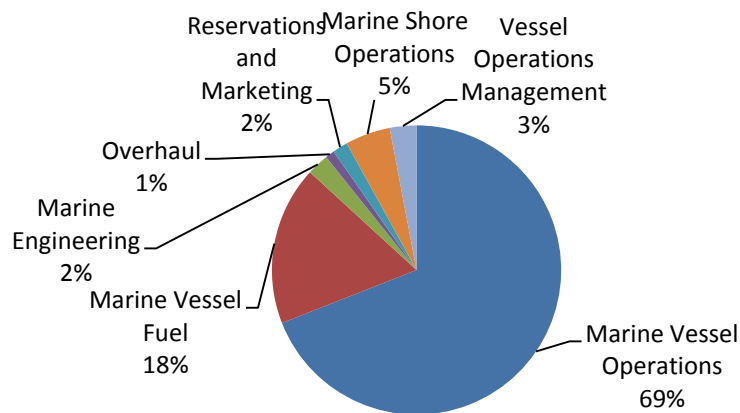
AMHS routine operations and maintenance includes scheduled service and operations, as well as expenditures for regular maintenance activities. AMHS operations expenditures are dependent on vessel schedules, increasing or decreasing as service increases or decreases. AMHS routine maintenance needs total \$197 million and include the following:

- AMHS will maintain, repair, refurbish, and upgrade vessel and terminal facilities in compliance with federal regulations
- Governor’s Budget for FY2016 (amended) is approximately \$160.7 million and includes vessel operations (\$113.5 million), fuel (\$26.7 million), engineering (\$3.9 million), overhaul (\$1.6 million), reservations/marketing (\$2.3 million), shore operations (\$8.4 million), and vessel operations management (\$4.2 million)
- SOLAS mainline ferry repower (\$35 million)
- Shoreside facilities condition survey (\$0.3 million in FFY17 and \$0.3 million in FFY19)
- Fleet condition survey update (\$0.38 million in FFY17 and \$0.38 million in FFY19)

### Operations and Maintenance Plan

A substantial amount of the DOT&PF budget is allocated to the AMHS—the AMHS accounts for nearly 50% of DOT&PF’s FY2015 General Fund Operating Budget.<sup>54</sup> AMHS funding is distributed into six categories, as depicted in Exhibit 104. Marine vessel operations account for approximately two-thirds of the proposed budget, while marine vessel fuel is the second largest category, accounting for nearly 20% of the proposed budget.

Exhibit 104: FY2015 Operating Budget, AMHS



<sup>54</sup> DOT&PF FY2015 Governor’s Request Review Presentation slides as presented to the House Finance Committee, dated 2/7/2014. Slide 35.

## Aviation

### Concepts and Definitions

The DOT&PF owns and operates approximately 90% of the public use airports in Alaska while municipalities own and operate the other 10%. This section addresses the needs for airports that are owned and operated by DOT&PF, while discussing the extent of the aviation system in Alaska. Exhibit 105 presents definitions used to support the analysis presented below, while

Plan  
Draft

Exhibit 106 presents the statewide inventory of airports by airport type.

**Exhibit 105: Aviation System Definitions**

| Acronym       | Definition  |
|---------------|---|
| <b>5010</b>   | Numerical FAA Form Reference to the FAA Airport Master Record program |
| <b>AASP</b>   | Alaska Aviation System Plan   |
| <b>AIAS</b>   | Alaska International Airport System                                   |
| <b>AIP</b>    | Airport Improvement Program   |
| <b>ANC</b>    | Ted Stevens Anchorage International Airport                           |
| <b>ARFF</b>   | Airport Rescue and Fire Fighting                                      |
| <b>CIMP</b>   | Capital Improvement and Maintenance Program                           |
| <b>FAA</b>    | Federal Aviation Administration                                       |
| <b>FAI</b>    | Fairbanks International Airport                                       |
| <b>GSP</b>    | Gross State Product   |
| <b>MSB</b>    | Matanuska Susitna Borough   |
| <b>NEXGEN</b> | Next Generation (NextGen) Air Traffic Control System                  |
| <b>NPIAS</b>  | National Plan of Integrated Airport Systems                           |
| <b>RAS</b>    | Rural Airport System  |
| <b>SPB</b>    | Seaplane Base   |
| <b>SREB</b>   | Snow Removal Equipment Building                                       |
| <b>TAM</b>    | Transportation Asset Management                                       |
| <b>TSA</b>    | Transportation Security Administration                                |

Draft

Exhibit 106: Statewide Airport Inventory

| Airport Type            | Statewide Total |
|-------------------------|-----------------|
| <b>State-Owned</b>      | <b>249</b>      |
| Airports, International | 2               |
| Airports, Rural         | 219             |
| Seaplane Bases          | 27              |
| Heliport                | 1               |
| <b>Privately-Owned</b>  | <b>1,112</b>    |
| Local/Tribal-Owned      | 48              |
| <b>TOTAL</b>            | <b>1,409</b>    |

Exhibit 107 identifies the top 15 airports in Alaska by enplanements.

Exhibit 107: Top 15 Airports – Rank By Enplanements in 2013

| Rank | Location    | Airport                           | 2013 Enplanements |
|------|-------------|-----------------------------------|-------------------|
| 1    | Anchorage   | Ted Stevens International Airport | 2,325,030         |
| 2    | Fairbanks   | Fairbanks International           | 457,372           |
| 3    | Juneau      | Juneau International              | 359,291           |
| 4    | Bethel      | Bethel                            | 152,084           |
| 5    | Ketchikan   | Ketchikan International           | 109,433           |
| 6    | Kenai       | Kenai Municipal                   | 99,821            |
| 7    | Kodiak      | Kodiak                            | 79,930            |
| 8    | Sitka       | Sitka Rocky Gutierrez             | 67,989            |
| 9    | Kotzebue    | Ralph Wien Memorial               | 61,274            |
| 10   | Nome        | Nome                              | 58,020            |
| 11   | Barrow      | Wiley Post-Will Rogers Memorial   | 51,568            |
| 12   | Deadhorse   | Deadhorse                         | 48,588            |
| 13   | Ketchikan   | Ketchikan Harbor                  | 45,477            |
| 14   | Homer       | Homer                             | 37,705            |
| 15   | King Salmon | King Salmon                       | 35,450            |

Source: 2015 AASP Data

The Alaska Aviation System analysis presented in this section uses information in the various documents that guide airport development and operations planning for the state. The primary documents included a suite of reports compiled for the Alaska Aviation System Plan starting in 2009 through 2015. In addition, public data from the Federal Aviation Administration (FAA) and the National Weather Service were used in combination with the above sources to prepare this analysis.

## Current Conditions

### *Aviation System*

The relationship between the people of Alaska and the state's aviation infrastructure is unique. Approximately 1 out of every 100 Alaskans is a pilot. In the U.S. as a whole, this number is closer to 1 in 1000. More than 80% of Alaskan communities are not connected to the road system, and therefore rely on air service to provide basic needs for medical supplies, fresh produce, and nearly all mail delivery provided by roads and highways in other states. For example, students living in South Naknek are flown across the river to North Naknek in the morning and back at night as the most efficient way to get to school on a daily basis.

Alaska's aviation system is the largest in the United States with 747 airports, heliports, and sea planes officially recorded in the FAA Airport Master Record database. These airports are owned and operated by a mix of state, local, and private entities. Of these, DOT&PF owns and operates 249 airports and seaplane bases. No other state owns and operates as many facilities. Of these 249 airports, two are major airports - Ted Stevens Anchorage International Airport (ANC) and Fairbanks International Airport (FAI). The rest of the airports (247) are a part of the Alaska Rural Airport System (RAS).

Two major airports, The Ted Stevens Anchorage International Airport (ANC) and Fairbanks International Airport (FAI), consist of Alaska's International Airport System (AIAS) and provide passenger cargo service for more than 30 international and domestic airlines operating in Alaska, U.S., Europe, and Asia.

Anchorage, the larger of the two AIAS airports, is the fifth largest airport in the world for cargo throughput and the second largest in the U.S. for landed weight. The ANC and FAI airports serve as weather alternates for one another and are equipped to handle any size and type of aircraft, anytime, with state-of-the-art landing systems and terminal facilities. Anchorage and Fairbanks are separated by the Alaska Range resulting in distinct weather patterns and never a simultaneous closure. Whether transiting across the Pacific from Asia, the Atlantic from Europe, or the continental U.S. from a host of major cities, airlines are assured a place to land at one of these two locations.

The RAS airports provide safe and reliable year-round access to other Alaskan communities. The majority of these airports offer scheduled commercial service, although only about 21% have paved runways. Local or tribal governments operate some DOT&PF-owned airports (e.g., Ketchikan) or own and operate passenger terminals on DOT&PF-owned airports (e.g., Cold Bay, Homer, Sand Point, and Unalaska). Non-DOT&PF airports include public, military, and private aviation facilities, including:

- 388 public facilities comprised of 290 airports, 86 SPBs, and 12 heliports owned by municipalities and the federal government
- 21 military facilities including 20 airports and 1 heliport owned by the U.S. Department of Defense
- 313 (known) private facilities comprised of 241 airports, 43 SPBs, and 29 heliports

An exact number of private facilities is difficult to determine due to the relative absence of land use controls and oversight, and the fact that many are not registered with the FAA in the Airport Master Record system.

Alaska has 25 FAA certified Part 139 airports. Part 139 provides certification for airports which service schedule air carrier operations in aircraft designed for more than 9 passenger seats but less than 31 passenger seats. In Alaska, the statutory authority of Part 139 doesn't apply to Alaskan airports which don't serve air carrier aircraft with more than 30 seats. Alaska's certified airports are presented in Exhibit 108 while Exhibit 109 shows the locations of these airports.

**Exhibit 108: Alaska's 25 Certified Part 139 Airports**

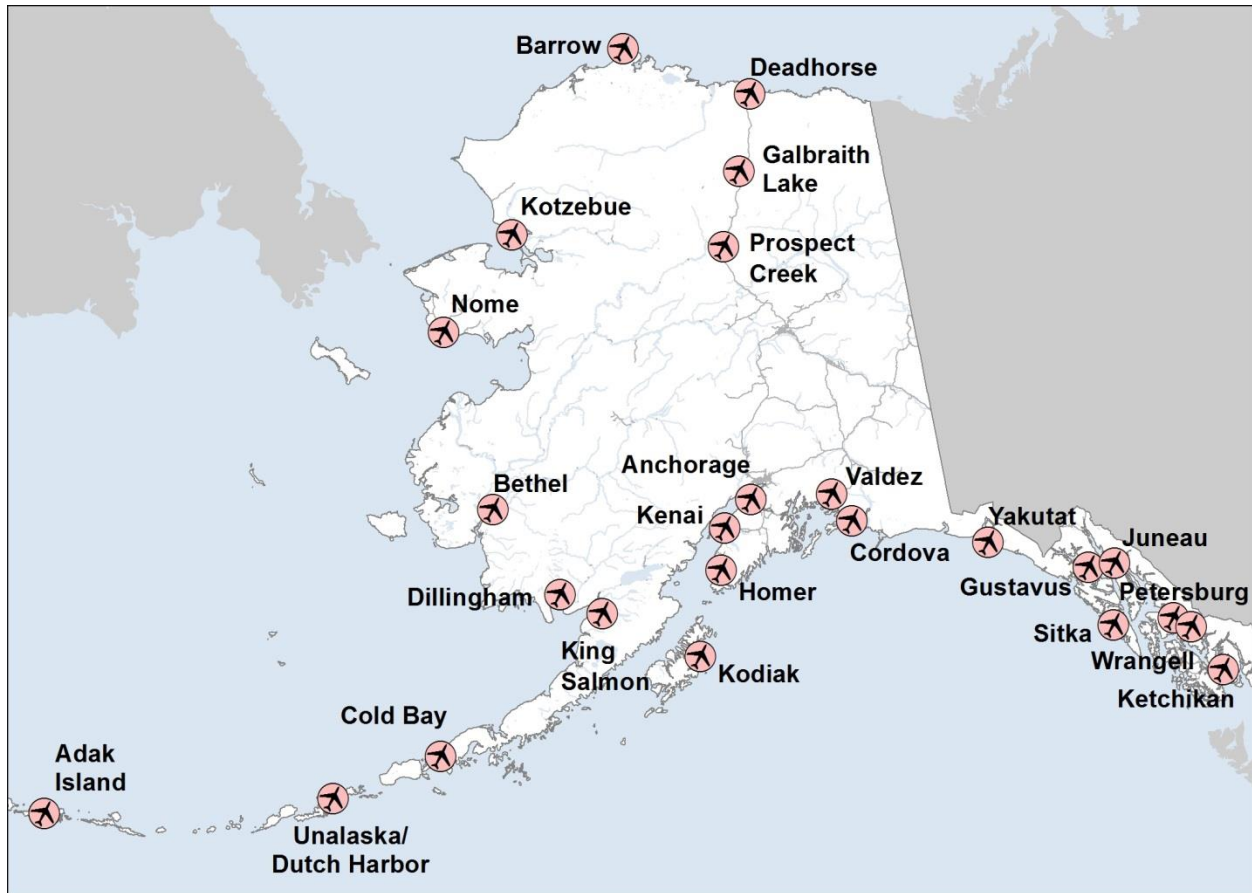
| #  | Airport   |
|----|---|
| 1  | Adak Island (ADK)                               |
| 2  | Ted Stevens Anchorage International (ANC)       |
| 3  | Barrow (BRW) - Wiley Posts/Will Rogers Memorial |
| 4  | Bethel (BET)                                    |
| 5  | Cold Bay (CDB)                                  |
| 6  | Cordova (CDV) - Merle K. Smith                  |
| 7  | Deadhorse (SCC)                                 |
| 8  | Dillingham (DLG)                                |
| 9  | Fairbanks International (FAI)                   |
| 10 | Gustavus (GST)                                  |
| 11 | Homer (HOM)                                     |
| 12 | Juneau International Airport (JNU)              |
| 13 | Kenai (ENA)                                     |
| 14 | Ketchikan (KTN)                                 |
| 15 | King Salmon (AKN)                               |
| 16 | Kodiak (ADQ)                                    |
| 17 | Kotzebue (OTZ) - Ralph Wien Memorial            |
| 18 | Nome (OME)                                      |
| 19 | Petersburg (PSG) - Petersburg James A. Johnson  |
| 20 | Red Dog Mine (DGG)*                             |
| 21 | Sitka (SIT) - Sitka Rocky Gutierrez             |
| 22 | Unalaska (DUT) - Tom Madsen                     |
| 23 | Valdez (VDZ) - Valdez Pioneer Field             |
| 24 | Wrangell (WRG)                                  |
| 25 | Yakutat (YAK)                                   |

[Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139) established certification requirements in 2004 for airports serving scheduled aircraft operations with more than 9 seats but less than 31 seats and scheduled/unscheduled air carrier aircraft with more than 30 seats. Certification requirements include having airport rescue and emergency plans, snow and ice control plan. Part 139 certification is maintained through regular safety inspections from the FAA.

\*Note: Red Dog Mine (DGG) is a Part 139 but it is privately owned.



Exhibit 109: Location of Alaska's 25 certificated Part 139 Airports



\*Note: This is a map of the public airports.

### *Role of Air Service in Alaska*

Viewed statewide, Alaska's airports support the movement of people and commerce in ways that roads support similar services in most other states. Air service plays a large role in Alaska's economy. The 2011 Alaska Aviation System Plan (AASP) estimated that the Alaska aviation industry contributed \$3.5 billion in economic output, about 8% of the State's \$44.5 billion gross state product (GSP), and supported more than 47,000 jobs statewide in 2007. Nationwide, the aviation industry accounted for 5.6% of national gross domestic product in 2006. The fact that the aviation industry's economic role in Alaska is almost 40% larger than identified nationally further demonstrates the importance of the aviation industry in Alaska. If data were routinely collected on the aviation industry in Alaska as a distinct economic sector, it would be the fifth largest economic sector in terms of contribution to GSP. The aviation industry accounts for 1 in 10 jobs in Anchorage and 1 in 20 jobs in Fairbanks.

Air services are available to remote communities throughout the state partially due to the federal Essential Air Service (EAS) program. After the Airline Deregulation Act of 1978, the EAS program was

established to guarantee service by subsidizing certified carriers flights for small communities. The EAS program currently subsidizes commuter airlines that serve approximately 163 rural communities across the country, with 44 of these communities located within Alaska. There were 237 Alaska communities on the original list of EAS-eligible communities. As of June 1, 2015, 44 communities received subsidized service, leaving 194 unsubsidized rural places. The annual contracted subsidy rate amounted to over \$15 million for air carriers serving communities in Alaska in 2015<sup>55</sup>. Diomedes is the only community which receives service from EAS funds via Air Transportation to Non-Eligible Places (ATNEP, 49 U.S.C. §41736). ATNEP allows state or local government the opportunity to propose to the Secretary of Transportation that DOT provide compensation to an air carrier to serve a place that is not EAS-eligible, with a 50 percent local share of the cost.

As mentioned earlier in this section, for Alaska communities without access to the state's road system, air travel is the only safe and reliable means of travel. These communities rely on air travel for emergencies, bringing medical personnel and other specialists to rural parts of Alaska, and providing ambulance services to transport sick and injured people to advanced medical care. Air transportation is often the only option for family visits, work- and school-related travel, social and vacation trips, and the transportation of food, materials and supplies, and mail.

Alaska's airports also support the state's tourism industry by providing flightseeing businesses as well as air service to remote locations. Public safety functions include air search and rescue operations and allowing the limited number of law enforcement personnel to cover the State's large geographic area. The airports provide not only the physical runways, taxiways, and aprons, but also support the aviation industry in general by providing lease of lots, and in some cases, buildings for aviation related businesses.

### *Finance and Funding*

Alaska relies heavily on the Federal Government for funding its aviation system. In spite of its dependence on air travel, Alaska is one of only two states in the country that has no dedicated state-funded aviation program. Aviation revenues are deposited in the state's general fund and are then re-appropriated back to agencies and local governments for aviation use.

The AIAS is a limited exception. Funds generated by the AIAS are kept within the AIAS budget and are not subject to deposit in the State General Fund or re-appropriation by the Legislature. The FAA's Airport Improvement Program (AIP) funds most of Alaska's RAS aviation capital improvement program and a portion of the AIAS capital improvements. AIP funding can only be spent on airports included in FAA's National Plan of Integrated Airport Systems (NPIAS). The NPIAS contains all commercial service airports, all reliever airports, and selected general aviation airports. In Alaska, the NPIAS consists of the

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<sup>55</sup> US DOT April 2015 Alaskan Subsidized EAS Reports

[https://www.transportation.gov/sites/dot.gov/files/docs/Subsidized%20EAS%20report%20for%20communities%20in%20Alaska-Apr%202015\\_0.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/Subsidized%20EAS%20report%20for%20communities%20in%20Alaska-Apr%202015_0.pdf)

AIAS, the RAS (with a few exceptions), and a number of local sponsor (municipally owned/operated) airports.

Exhibit 110 presents a summary of funding allocations and sources for aviation from 2001 through 2016 (expected) across the entire aviation system, including by various federal source, AIAS and RAS systems, and local sponsors. While the funding levels have increased over time (2001 to 2016) across each system and region, the percent of funding allocations has remained relatively consistent for both the AIAS (17% to 27% depending on the year) and RAS (56% to 75% depending on the year).

Exhibit 110: Funding Allocations and Sources for Alaska Aviation, 2001 to 2016 (Draft)

| Federal Fiscal Year | FAA AK Region AIP Allocation | AIAS AIP Received | AIAS % of Total | RAS AIP Received | RAS % of Total | Local Sponsor AIP Received | Local Sponsor % of Total |
|---------------------|------------------------------|-------------------|-----------------|------------------|----------------|----------------------------|--------------------------|
| FFY'01              | \$ 142,296,065               | \$ 38,814,143     | 27%             | \$ 87,315,547    | 61%            | \$ 16,166,375              | 11%                      |
| FFY'02              | \$ 148,804,176               | \$ 30,123,412     | 20%             | \$ 102,838,454   | 69%            | \$ 15,842,310              | 11%                      |
| FFY'03              | \$ 189,988,428               | \$ 44,944,774     | 24%             | \$ 126,328,765   | 66%            | \$ 18,714,889              | 10%                      |
| FFY'04              | \$ 219,621,399               | \$ 53,208,162     | 24%             | \$ 152,461,880   | 69%            | \$ 13,951,357              | 6%                       |
| FFY'05              | \$ 193,503,911               | \$ 39,949,171     | 21%             | \$ 144,242,035   | 75%            | \$ 9,312,705               | 5%                       |
| FFY'06              | \$ 227,131,157               | \$ 48,586,607     | 21%             | \$ 148,868,255   | 66%            | \$ 29,676,295              | 13%                      |
| FFY'07              | \$ 210,329,085               | \$ 50,431,015     | 24%             | \$ 122,830,604   | 58%            | \$ 37,067,466              | 18%                      |
| FFY'08              | \$ 226,389,434               | \$ 66,468,253     | 29%             | \$ 143,445,250   | 63%            | \$ 16,475,931              | 7%                       |
| FFY'09              | \$ 208,053,432               | \$ 35,030,655     | 17%             | \$ 144,648,527   | 70%            | \$ 28,374,250              | 14%                      |
| FFY'10              | \$ 236,716,659               | \$ 50,125,392     | 21%             | \$ 176,690,626   | 75%            | \$ 9,900,641               | 4%                       |
| FFY'11              | \$ 229,144,639               | \$ 55,179,960     | 24%             | \$ 150,370,603   | 66%            | \$ 23,594,076              | 10%                      |
| FFY'12              | \$ 225,596,880               | \$ 45,987,333     | 20%             | \$ 126,709,764   | 56%            | \$ 52,899,783              | 23%                      |
| FFY'13              | \$ 197,163,773               | \$ 49,777,301     | 25%             | \$ 127,688,970   | 65%            | \$ 19,697,502              | 10%                      |
| FFY'14              | \$ 201,804,641               | \$ 49,509,918     | 25%             | \$ 125,200,301   | 62%            | \$ 27,094,422              | 13%                      |
| FFY'15              | \$ 200,781,762               | \$ 42,396,183     | 21%             | \$ 145,851,301   | 73%            | \$ 12,534,278              | 6%                       |
| FFY'16              | \$ 199,916,725               | \$ 47,227,801     | 24%             | \$ 132,913,524   | 66%            | \$ 19,775,401              | 10%                      |

### Future Characteristics

Key future characteristics of Alaska’s aviation system include:

- Maintenance and operation costs of Alaskan airports are expected to increase, while government funding of aviation services is projected to decrease; and
- FAA’s Part 139 certification does not apply to many Alaskan communities; and
- Smaller aircrafts will continue to be used to service remote communities and this trend is expected to grow in the future as more of Alaska’s rural population migrates to urban areas.

Given that the need for aviation capital improvements is significant across Alaska, the ability of the State, municipal governments, and the FAA to fund improvements to every public use airport is difficult at best and not realistic at worst. In addition, the cost to maintain and operate airports is increasing, whereas the ability of the governments to fund these services is decreasing. Across the state, services

are contracting as the rural population continues to move to urban areas. The FAA amended Part 139 in 2004 to scheduled aircraft with more than 9 passenger seats except in Alaska. This did not apply to Alaskan airports, where it requires scheduled aircraft with more than 30 passenger seats, because the 2004 amendment would have required DOT&PF to certify 30 additional airports. Certifying to fulfill 139 standards would have cost \$1 million per airport and significantly increased the annual operating needs of the RAS. When air service was regulated in 1978, and travel in Alaska was dominated by Wien Airlines and a few other carriers, Alaska was dotted with Part 139 airports. These have been whittled away by the economics of providing air service, and now are served by smaller and smaller aircraft. This trend is expected to continue into the future.

The DOT&PF is exploring the cancelation of the Part 139 certificates for Galbraith and Prospect in 2016. These airports support the rotation of pipeline operations personnel, and are being phased out as the pipeline operation changes. The only Part 139 airport remaining in the mainland of Alaska is Fairbanks International. All other Part 139 airports are on the coast, the Alaska Peninsula, and panhandle.

The future of air service in Alaska will need to be designed to match available funding to maintain, operate, and upgrade the airports. The Alaska Aviation System Plan will be used to determine the parameters for continued DOT&PF support of airports. The communities that fall below the threshold for DOT&PF support will be given their airports, as the AIP obligations of safe facilities operation and serviceable airport conditions to maintain them expire.

Generally these AIP obligations are for 20 years after the grant is issued. The local communities will then be responsible for maintaining and funding their airports. Air carriers will also be challenged to change the fleet to aircraft that can operate on surfaces that in all probability will not be constructed or maintained to FAA standards. This may include more ski equipped aircraft for winter operations and aircraft with short takeoff and landing characteristics.

### *Future Aviation Traffic Forecasts*

Future aviation traffic forecast are expected to include characteristics:

- Alaska aircraft air carrier operations, based on passenger enplanements and cargo tonnage, are expected to grow through 2030;
- Cargo is expected to increase by 2030 due to more international cargo coming through the Alaska International Airport System (e.g., an increase of 2.9 percent per year can be projected in the Anchorage and 1.3 percent per year in Fairbanks); and
- Passenger enplanements are projected to grow 1.4 percent to 2.3 million with the fastest growth in the Fairbanks Borough, Mat-Su Borough, and North Slope regions.

According to the “Alaska International Airport System – Forecast Technical Report” (2013), passenger enplanements for ANC were projected to increase by about 1.0 percent per year to 3,132,545 by 2030. ANC enplanements have gone up 4% since 2009 and FAI enplanements have gone up 7%. At FAI,

passenger traffic was projected to grow 1.2 percent per year to 654,541. Actual passenger enplanements for ANC and FAI in 2014 were within 2% of the forecast.

In conformance with FAA Advisory Circulars<sup>56</sup>, aviation activity forecasts typically identify a *critical aircraft* for use in determining future runway dimensional requirements. The critical aircraft can be a specific aircraft model or a composite of several aircraft and is expected to have at least 500 annual operations. It is anticipated that these characteristics will be similar to the Boeing 787, Boeing 747-800, and the Airbus 350XWB aircraft currently in use.

An AASP forecast was completed in 2011 for the RAS covering the years 2010–2030. Passenger enplanements are projected to grow to 2.3 million by 2030, an annual increase of 1.4% with the fastest growth occurring in the Matanuska Susitna, North Slope and Fairbanks North Star Boroughs. Total air cargo tonnage is anticipated to increase to 353,000 by 2030, an average annual increase of 1.8%. Total commercial aircraft operations are forecast to increase at an annual rate of 0.2% per year to 1.16 million by 2030. The critical aircraft recommended by the forecasts varies considerably by airport, depending upon forecasted payload requirements and anticipated air carrier fleet changes. The Boeing 737-200 was identified as the critical aircraft at airports where the Boeing 737-400 or 737-800 operates or is expected to operate. This is because the full-payload runway requirements of the 737-200 slightly exceed those of the other two aircraft. For smaller airports, aircraft such as the Beechcraft 1900, Beech King Air 200, Cessna 206 and Cessna 185 were recommended. The study concluded that the primary needs at most of Alaska's RAS airports were not capacity-related but, instead, driven by the need to make airports compliant with basic FAA-defined airport design standards. Activity data collected more recently regarding annual passenger enplanements for the RAS have shown that growth has collectively flattened since 2009.

## Needs

Alaska's aviation system future needs are presented below by system development, life-cycle management, and routine maintenance needs.

### *System Development Needs*

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<sup>56</sup> FAA Advisory Circular 150/5300-13A and 150/5070-6B

Exhibit 111 presents an estimation of aviation system development needs, based on projects listed in the regional and metropolitan plans. Aviation needs total over \$9.3 million per year.

Plan  
Draft

Exhibit 111: Aviation System Development Needs

| Transportation Plan               | Cost, 2014 \$*     |
|-----------------------------------|--------------------|
| <b>Regional Plans</b>             |                    |
| Southeast Alaska                  | \$2,700,000        |
| Southwest Alaska                  | --                 |
| Interior Alaska                   | \$4,600,000        |
| Yukon Delta                       | --                 |
| Prince William Sound              | \$17,000           |
| Northwest Alaska                  | --                 |
| <b>Regional Plan Subtotal</b>     | <b>\$7,317,000</b> |
| <b>Metropolitan Plans</b>         |                    |
| Anchorage                         | --                 |
| Fairbanks                         | --                 |
| Mat-Su Borough                    | \$2,000,000        |
| <b>Metropolitan Plan Subtotal</b> | <b>\$2,000,000</b> |
| <b>System Development Total</b>   | <b>\$9,317,000</b> |

\*Excludes Preservation, which is accounted for in Lifecycle Needs

Future system development needs for aviation is composed of two primary goals in which the state will develop and implement plans. These include:

1. Increase Safety. The measures identified to meet increased safety goals include:
  - Upgrading/Replacing Navigation Aids; and
  - Increasing the Use of Automated Weather Reporting Systems.
2. More efficient management of the planning, designing, and operating of aviation facilities. The measures identified to meet these future efficiency goals include:
  - Facilitate better airport services; and
  - Reduce the number of Part 139 inspection problems.

#### Upgrade/Replace Aging FAA Navigation Aids

FAA Navigation Aids will help to improve safety in Alaskan air travel by providing more precision on flight tracking. NextGen<sup>57</sup> implementation to replace many of these aging navigation aids (navaids) is uncertain. The FAA over many years has installed a system of enroute and terminal navigation aids to enable flight under instrument rules. Many of these systems are old and beyond their service life while others have become obsolete. The FAA has implemented a program to phase out navaids that have limited use or do not meet system needs. Many terminal terrestrial navaid functions are being replaced by satellite based

<sup>57</sup> The NextGen satellite technology enables the FAA to guide and track air craft movement more precisely on more direct routes. NextGen enhances safety on increasingly congested airspace, saves fuel, and reduces aircraft exhaust emissions.



technology and routes. This has become an issue for older aircraft that have not been upgraded to newer technology. For example, older planes cannot be upgraded cost effectively because of expensive (e.g., unaffordable) navigation equipment.

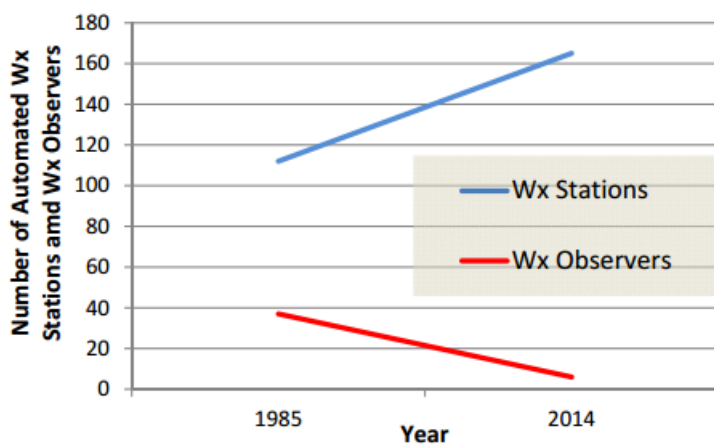
The industry and DOT&PF have also been working for many years with FAA to implement NextGen in Alaska. The FAA has installed the ground based infrastructure in much of Alaska as well as implemented NextGen procedures and equipment for air traffic control. The commercial aviation industry requested a percentage of Alaska covering high use areas to utilize NextGen services. The FAA has not agreed with the final build out for NextGen coverage in Alaska. This is an ongoing discussion.

Automatic Weather Observation Reporting

Weather is often cited as a factor in aircraft accidents in Alaska. Lack of weather reporting is also often cited. Alaska has the lowest density of weather reporting of any state. For example, Alaska only has 7 weather radar facilities. To achieve the same density of weather radars available in the lower 48 states, Alaska would need a total of 25 (compared to its current 7) systems to meet its weather coverage goals.

The number of supplemental weather observers in Alaska has decreased from 37 in 1985 to 6 in 2014 (Exhibit 112). However, automated weather stations have increased from 112 in 1985 to 165 in 2014. The National Weather Service supports the installation of weather observation facilities so they can generate forecasts of weather. Airports need weather reports to allow pilots to use instrument approach procedures for landings and takeoffs. Often the weather observation taken at the airport for flight purposes is also used to forecast future weather.

Exhibit 112: Automated Weather Stations and Weather Observers 1985-2014



| Year | Automated Weather Stations | Weather Observers |
|------|----------------------------|-------------------|
| 1985 | 112                        | 37                |
| 2014 | 165                        | 6                 |



In many cases airports in Alaska would like to utilize instrument flight rules but cannot due to lack of weather reporting. Implementing automated weather stations is a need, especially when it comes to servicing off-road communities which rely most on traveling by plane. Costs for future automated weather stations amount to \$18 million in off-road and on-road airports (

Exhibit 113).

**Exhibit 113: Costs for Automated Weather Station at Community Off Road and On-Road Airports**

| AASP Classification       | Costs               |
|---------------------------|---------------------|
| International             |                     |
| Regional                  |                     |
| Community Off-Road        | \$16,200,000        |
| Community On-Road         | \$1,800,000         |
| Local NPIAS High Activity |                     |
| Local NPIAS Low Activity  |                     |
| Local Non-NPIAS           |                     |
| <b>Total</b>              | <b>\$18,000,000</b> |

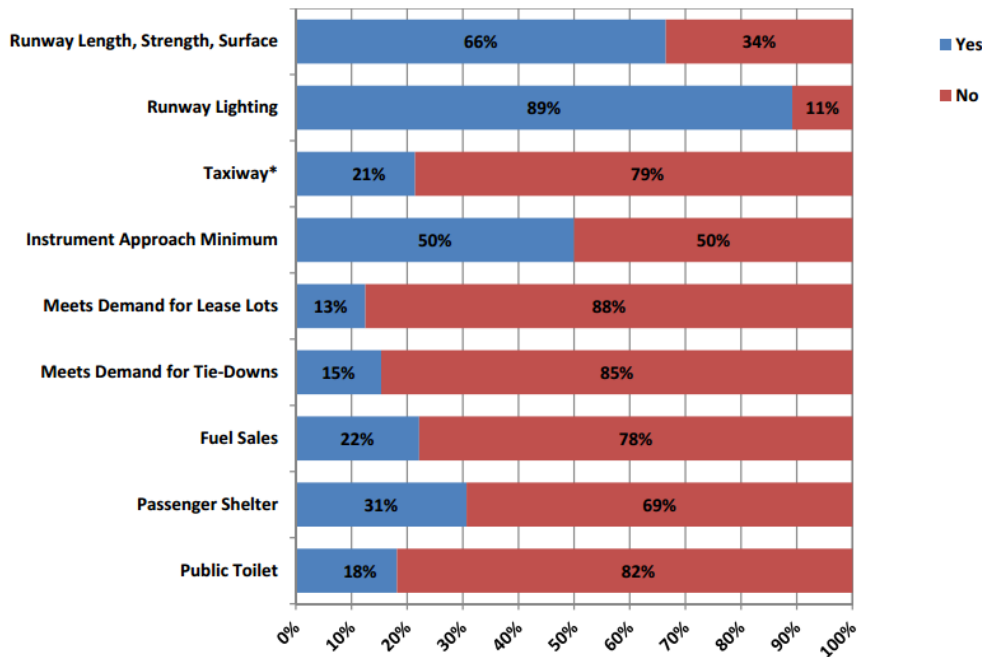
#### Facilitate Better Airport Services

The AASP produced a Service Index of regional and community airports throughout the state. Several facility and services categories were included in the 2011 Airport Service Index (

Exhibit 114). The study revealed that only 13 percent of all Alaska airports met the demands for lease lots and 15 percent for tie-downs. Other categories such as public toilets and a taxiway were also not met by a large number of airports in the state. The ability of an airport to meet demand for tie-down parking space and lease-lot is an important characteristic of growing airports. Taxiway service was

evaluated for regional airports in this study. When airports provide a taxiway service, it can increase safety of aircraft operations, mitigating potential for accidents on the runway to occur. Public restrooms and passenger shelters are minimum amenities all airports should provide relief and additional comfort for flying passengers.

Exhibit 114: Airport Classification Services Indices with Combined Off-Road and On-Road Communities



Source: AASP 2015

### Reduction in Number of Part 139 Services

In all states except Alaska, 14 CFR 139 applies to scheduled aircraft with more than nine passenger seats. In Alaska, Part 139 applies to scheduled aircraft with more than 30 passenger seats. If this regulation were applied to Alaska in the same manner as the Lower 48, it would require the DOT&PF to certify approximately 30 additional airports. The approximate cost to bring these airports up to full Part 139 standards would be well over \$1M per airport and significantly increase the annual operating needs of the rural aviation system. These safety services include daily runway inspections, airport rescue and firefighting (ARFF), and enhanced snow removal services.

### *Life Cycle Management Needs*

Life cycle management needs pertain to maintaining airports in reasonable condition and working order. Maximizing an airport's life cycle requires regular upkeep of runways, aprons, taxiways, and various additional airport facilities. Life cycle management needs were analyzed for paved and unpaved airports by updating lifecycle management models that were prepared as a part of the last plan update. The updates to the models accounted for changes in airport condition as well as updates to costs to maintain various aspects of the airport. The paved airports model utilizes Pavement Condition Index (PCI) as the measure of runways, aprons and taxiways condition, and how various treatments would improve the condition.

### Paved Airports

Paved airports need regular maintenance in order to be safe including the need for consistent rehabilitation and preservation of existing runways, aprons, or taxiways that are still in an acceptable condition. The Pavement Condition Index (PCI) data is used by the DOT&PF as an indicator of condition for paved airports. The guidelines for PCI goals, as set by the Alaska Legislature, are 70 for runways and 60 for taxiways and aprons. If the PCI goal of 70 for paved runways and 60 for taxiways and aprons are not achieved, then rehabilitation / upgrading of these systems will be required to meet the goals. The DOT&PF is also just beginning to use the Pavement Classification Number (PCN) as an indicator of pavement strength using a single unique number to express the load carrying capacity of a pavement without specifying a particular airplane or pavement structure. A pavement with a given PCN can support, without weight restriction, an aircraft with an Aircraft Classification Number (ACN) equal to or less than the pavement PCN. The International Civil Aviation Organization (ICAO) methodology has been adopted by the FAA as a way to relay pavement strength to users. Use of a PCN will replace the allowable loads by gear type currently in use to convey pavement strength. This requirement is applied to certified airports certified by 14 CFR 139. PCN will be added to the Airport Master Record for these airports, and future updates to lifecycle management needs will be able to use this indicator for calculating lifecycle management needs.

Airport Inventory and Condition

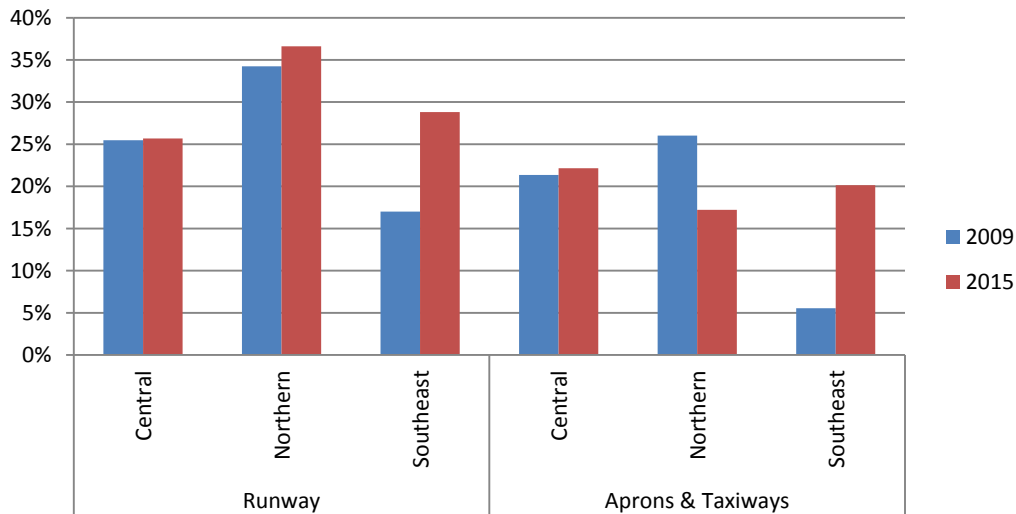
In order to calculate the new needs for airports, the total square footage of paved airports owned by the state was updated with current and available data. The state of Alaska has just over 96 million square feet of paved airports. Exhibit 115 presents the paved airport area by each region (Northern, Central and Southeast), compared to the previous model.

Exhibit 115: Paved Airport Area Comparison

|                    | Paved Airports,<br>Previous Model (2009, sqf) | Paved Airports,<br>Updated Model (Current, sqf) |
|--------------------|---|---|
| Northern           | 22.1M   | 23.4M   |
| Central            | 45.8M   | 52.7M   |
| Southeast          | 21.0M   | 20.6M   |
| <b>State Total</b> | <b>88.9M</b>                                  | <b>96.7M</b>                                    |

Updated data indicates that the overall condition of airports in Alaska improved since the previous LRTP (2009). Exhibit 116 shows the percentage of the system below the PCI standards for the DOT&PF, by system components and by region. Airport sections that currently fall below these standards/values are considered deficient and are part of the backlog and that need to be addressed as soon as possible.

Exhibit 116: Percentage of System below Pavement Condition Standard (PCI)



Source: DOT&PF Maintenance Department

Life cycle management treatments, timings, and costs for each region were arrived at through discussions with the materials section and DOT&PF maintenance managers. The PCI data for each airport component was used to estimate its timing within the life cycle. Unit costs of treatment were determined (square feet) and yearly cost of life cycle management was calculated. Airport area is reported in square feet through the airport pavement management system, and is reported in terms of lane miles by the DOT&PF maintenance section.

An average of 29% of runways fall below the PCI threshold value of 70 (compared to 26% in 2008), while only 21% of aprons and taxiways across the state fall below the PCI threshold of 60 (compared to 19% in 2008). This indicates that there is still a significant backlog of airport pavements that need immediate rehabilitation work to maintain proper level of service. Though slightly, the condition of paved airports has decreased since the 2008 model.

Treatment Cycles and Unit Cost Information

Three treatments were identified for paved airports: crack sealing, mill and overlay, and reconstruction. Exhibit 117 shows the life cycle treatments, timing, and costs that were developed and used in the model.

**Exhibit 117: Paved Airports Life Cycle Management Treatments, Timings and Costs**

|                            |               | Crack Sealing | Mill and Overlay | Reconstruction |
|----------------------------|---------------|---------------|------------------|----------------|
| <b>Runways</b>             | <b>Timing</b> | Every 5 Years | Year 20          | Year 40        |
| <b>Taxiways and Aprons</b> | <b>Timing</b> | Every 5 Years | Year 24          | Year 48        |
| <b>Cost/sqft</b>           |               | <b>\$0.06</b> | <b>\$5.82</b>    | <b>\$19.41</b> |

Source: DOT&PF Maintenance Department

The treatment schedule is the same as the previous model and cost data was updated based on a 3% annual inflation rate, from 2008 to 2015.

Deterioration Methodology and Needs Analysis

The underlying assumption is that for runways, each year the PCI value will decrease 3 points. For taxiways and runways, the PCI value is assumed to decrease 3 points till year 20 and decrease by 4 points between years 20 through 24. A crack sealing is assumed to increase the PCI by 9 points, while a mill & overlay as well as reconstruction bring the PCI value back to 100.

Life cycle management needs as calculated from the model, over a 23 year forecast, are shown in Exhibit 118.

**Exhibit 118: Paved Airports Life Cycle Management Needs (Current Dollars)**

|          |                   | Backlog (\$ Millions) | Life Cycle Needs 2015 – 2037 (\$ Millions) | Total (\$ Millions) |
|----------|-------------------|-----------------------|--|---------------------|
| Northern | Runways           | \$167                 | \$74                                       | \$241               |
|          | Taxiways & Aprons | \$78                  | \$74                                       | \$153               |
| Central  | Runways           | \$263                 | \$206                                      | \$469               |

|              |                   |              |              |                |
|--------------|-------------------|--------------|--------------|----------------|
|              | Taxiways & Aprons | \$227        | \$206        | \$433          |
| Southeast    | Runways           | \$115        | \$107        | \$222          |
|              | Taxiways & Aprons | \$81         | \$79         | \$160          |
| <b>Total</b> |                   | <b>\$930</b> | <b>\$747</b> | <b>\$1,677</b> |

*\*Note: For the purposes of this model, the backlog reconstruction needs were assumed to be addressed during the first ten years of the model forecast. The preservation work for airports currently on the backlog will then be implemented as the backlog is addressed over the first ten years (included in the life cycle needs).*

Source: DOT&PF Maintenance Department

The raw comparison between 2009 and 2015 data is presented in Exhibit 119 and it is important to emphasize that these costs are based on current dollars of the respective model year. Further, the 2009 model was based on a 24-year horizon forecast which was converted to a 23-year total to compare to the 2015 model.

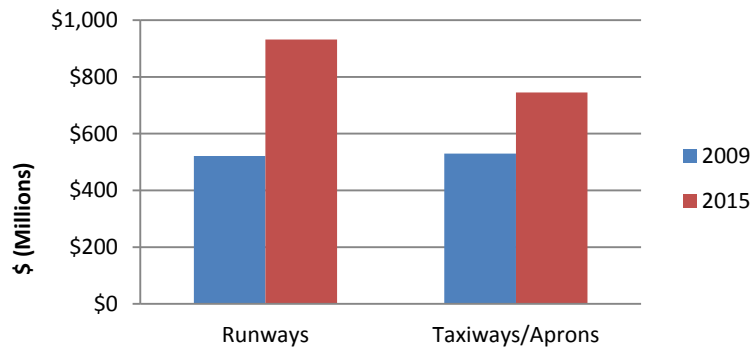
Exhibit 119: Maintenance Total Lifecycle Needs Comparison

|                     | 2009<br>(2009 Dollars)<br>(\$ Millions)<br>(24-year) | 2009<br>(2009 Dollars)<br>(\$ Millions)<br>(23-year) | 2015<br>(2015 Dollars)<br>(\$ Millions)<br>(23-year) |
|---------------------|--|--|--|
| Backlog             | \$541  | \$541  | \$930  |
| LC Needs (23 Years) | \$552  | \$510  | \$747  |
| <b>Total</b>        | <b>\$1,093</b>                                       | <b>\$1,051</b>                                       | <b>\$1,677</b>                                       |
| <b>Average</b>      | <b>\$46</b>  | <b>\$46</b>  | <b>\$73</b>  |

Source: DOT&PF Maintenance Department

When taking into account these reasons and comparing the data in 2015 dollars, pavement needs have increased by approximately \$300 million. This is validated based on the decrease in paved airport condition across the state. Exhibit 120 illustrates the needs comparison based on system.

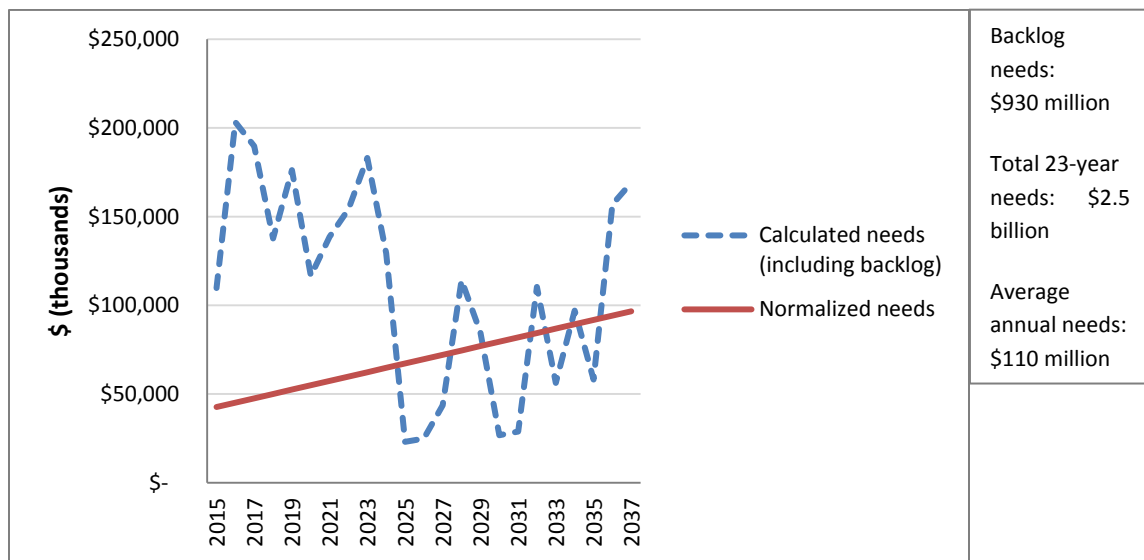
Exhibit 120: Paved Airports Total Life Cycle Needs Comparison (Current Dollars)



Source: DOT&PF Maintenance Department

Exhibit 121 presents the total lifecycle management needs. The “calculated needs” line shows total life cycle needs as arrived from the model, while the “normalized needs” line presents the same needs consistently (without sudden spikes and drops).

Exhibit 121: Paved Airports Life Cycle Needs (Year of Expenditure Dollars)



Source: DOT&PF Maintenance Department

### Unpaved Airports

Unpaved airport condition is not recorded by the DOT&PF, and hence, the threshold value approach to treatment timing used for paved airports does not apply to unpaved airports. Treatment cycles and costs for unpaved airports were determined through discussions with DOT&PF maintenance managers based on their experience. Compared to the 2009 model, costs were inflated from 2009 to 2015 dollars, at a 3% annual inflation rate.

Accurate data in terms of square footage of unpaved airports is not available for the central region, and the data used is an approximation defined by the regional staff. There are no unpaved state-owned airports reported in the Southeast region. Two treatments were identified for unpaved airports: adding dust palliatives every 3 years, and adding surface material every 10 years. It was assumed that work required on these airports will be evenly distributed throughout the life cycle. Based on these cycles and costs per square feet of these treatments, the total unpaved airport needs are presented in Exhibit 122. It is estimated that \$16.7M would be required every year for unpaved airports.

Exhibit 122: Unpaved Airports Treatment Cycles

|                 | Airports |            | Surface Material (\$/sqft) | Dust Palliative (\$/sqft) | Surface Material (every 10 yr) | Miles Dust (every 2 yr) | Need         |
|-----------------|----------|------------|----------------------------|---------------------------|--------------------------------|-------------------------|--------------|
|                 | Number   | SqFt       |                            |                           |                                |                         |              |
| <b>Northern</b> | 89       | 76,025,664 | \$0.23                     | \$0.42                    | 7,602,566                      | 25,341,888              | \$12,368,387 |

|              |            |                    |        |        |                   |                   |                     |
|--------------|------------|--------------------|--------|--------|-------------------|-------------------|---------------------|
| Central      | 86         | 26,769,600         | \$0.23 | \$0.42 | 2,676,960         | 8,923,200         | \$4,355,066         |
| Southeast    | 0          | -                  |        |        | -                 | -                 | \$0                 |
| <b>Total</b> | <b>175</b> | <b>102,795,264</b> |        |        | <b>10,279,526</b> | <b>34,265,088</b> | <b>\$16,723,452</b> |

Source: DOT&PF Maintenance Department

**Routine Maintenance Needs**

The cost of airport maintenance has grown dramatically from 1981 to 2013 as mentioned in the AASP<sup>58</sup>. As shown in Exhibit 123, Regional airports’ average maintenance and operations (M&O) costs have nearly tripled over that time-frame. M&O costs at Community Off-Road airports have grown approximately four-fold from 1981 to 2013.

Exhibit 123: Average M&O Costs at Regional, Community Off-Road and Other Airports 1981 vs 2013



Source: AASP 2015

The model developed and used in this analysis (update to the model used for *Let's Get Moving 2030*) estimated the need by type of surface (paved or unpaved) and region. Further, routine maintenance cycle and costs were confirmed by DOT&PF maintenance managers. Costs were inflated by 3% per year since the last estimate, and updated for an increase in number and area of airports. A total number of routine maintenance is presented here, instead of a detailed breakdown, since the planning-level estimate is not based on any specific detailed routine maintenance data. The annual routine maintenance needs for both paved and updated airports are estimated to be \$33.4 million, up from \$25.9 million estimate in *Let's Get Moving 2030*.

<sup>58</sup> [http://www.alaskaasp.com/media/1624/54643\\_dowl\\_hkm\\_exec\\_summ\\_web.pdf](http://www.alaskaasp.com/media/1624/54643_dowl_hkm_exec_summ_web.pdf)



### *Total Aviation System Needs*

In 2013, the AASP initiated a pilot program now referred to as the Capital Improvement and Maintenance Program (CIMP). Airport CIMP inspections were conducted at a sample of 18 RAS and local sponsor airports of various sizes throughout the state. The inspections identified the need for projects at these airports totaling more than \$1.1 billion dollars.<sup>59</sup> By the end of 2015 nearly half of the RAS has been inspected, with the goal of inspecting each airport annually and to update the airport needs thus identified. If one assumes that this sample is a fair representation of the non-AIAS system as a whole, total current system needs could approach \$16 billion (which would include the needs calculated in this document for lifecycle management and routine maintenance). At an average rate of about \$157 million provided by the AIP per year for the RAS and local sponsor airports combined, it would take about 102 years to address current needs, with no allowance for facility replacement due to age or system growth.

In February of 2015, DOT&PF published the “Alaska Airport Needs Directory”, a more generalized assessment of system needs on an airport by airport basis, but lacking cost estimates. The Directory confirms that needs across the system are extensive. This has been expanded as of the fall of 2015 with all needs from the Needs Directory, CIMP inspections, deferred maintenance, and other miscellaneous needs now compiled on the Alaska Aviation System Plan web site. The goal is to have a central repository for all needs to provide a better look at the system as a whole and provide a better understanding of current needs and issues.

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<sup>59</sup> AASP, “Airport Needs Inspection Pilot Project,” May 2013

## Public Transportation

### Concepts and Definitions

All large transit systems in Alaska are operated and funded by a unit of the local city or borough government. Although the State, through the DOT&PF Alaska Community Transit Office, distributes federal transit funding for all communities with transit service (with some exceptions), it does not, however, directly administer or operate any transit service. Most of the smaller transit systems are organized as private-non-profit agencies or run by other community private-non-profit social service agencies and a small number are also supported by local government.

In addition to these service models, there are a variety of transit ownership and operating models in use in Alaska—including local government operated, private non-profit operated, and a coordinated service model. These models are discussed in more detail in the *Alaska Transit Operations* section.

#### Exhibit 124: Local and Regional Transit Services Models Operating in Alaska

**Commuter Bus** - Fixed-route bus systems that are primarily connecting outlying areas with a central city through bus service that operates with at least five miles of continuous, closed-door service. This service may operate motorcoaches (aka over-the-road buses), and usually features peak scheduling, multiple-trip tickets and limited stops in the central city.

**Complementary Paratransit Services** - Transportation service required by the Americans with Disabilities Act (ADA) for individuals with disabilities who are unable to use fixed route transportation systems. This service must be comparable to the level of service provided to individuals without disabilities who use the fixed route system and meet the requirements specified in federal regulations. The complementary services must be origin-to-destination service or on-call demand response service to an accessible fixed route where such service enables the individual to use the fixed route bus system for his or her trip. Service must be provided in a corridor  $\frac{3}{4}$  of a mile on either side of the bus routes.

**Demand Response Service** - Shared use transit service operating in response to calls from passengers or their agents to the transit operator, who schedules a vehicle to pick up the passengers to transport them to their destinations.

**Route Deviation Service** - Vehicles operate on a fixed route and schedule, but can deviate to serve specific locations off the route.

**Fixed Route Service** - Transit service using rubber tired passenger vehicles operating on fixed routes and schedules, regardless of whether a passenger actively requests a vehicle.

## **Analysis Approach**

Data supporting this section was obtained from DOT&PF and from a survey of individual transit providers in the state conducted in 2014. The objective is to report, as accurately as possible, the operating practices, equipment, and service needs of each transit system based on the responses to the survey.

## **Current Conditions**

The larger communities in Alaska—Anchorage, Fairbanks and Juneau—have transit systems that were established in the 1970s. Ridership in each community has increased as a function of both service offered and population growth. More recently, service for the general public has been initiated in a number of other communities, including Ketchikan, Sitka, Kodiak, Bethel, Talkeetna, Girdwood, Kenai/Soldotna and the Mat-Su Borough (MSB). Most of the transit systems in Alaska have experienced fluctuations in available funding, which have resulted in changes in routes and service hours.

## ***Alaska Transit Operations***

The availability, frequency, and geographic coverage of transit services correlate with the size of the population served—the Southcentral and Southeast regions of the State have the most public transit service per capita, while relatively minimal service is provided in Northern and rural communities. The distribution of the population served also plays a role in transit success, since population density can determine how expensive transit is to operate per passenger. Geographically linear communities, such as Juneau and Ketchikan, provide cost-effective public transit (relative to the number of residents) since a large portion of the community can be reached along one main transportation corridor, requiring fewer vehicles in operation to provide effective service.

Although fixed route service is primarily provided in Alaska's larger population centers, it generates 87 percent of public transit ridership statewide (

Exhibit 125). The second most utilized mode is demand-response (8 percent of ridership), while taxi-based (less than 1 percent) services are used the least.

Plan  
Draft

Exhibit 125: Statewide Transit Ridership by Type

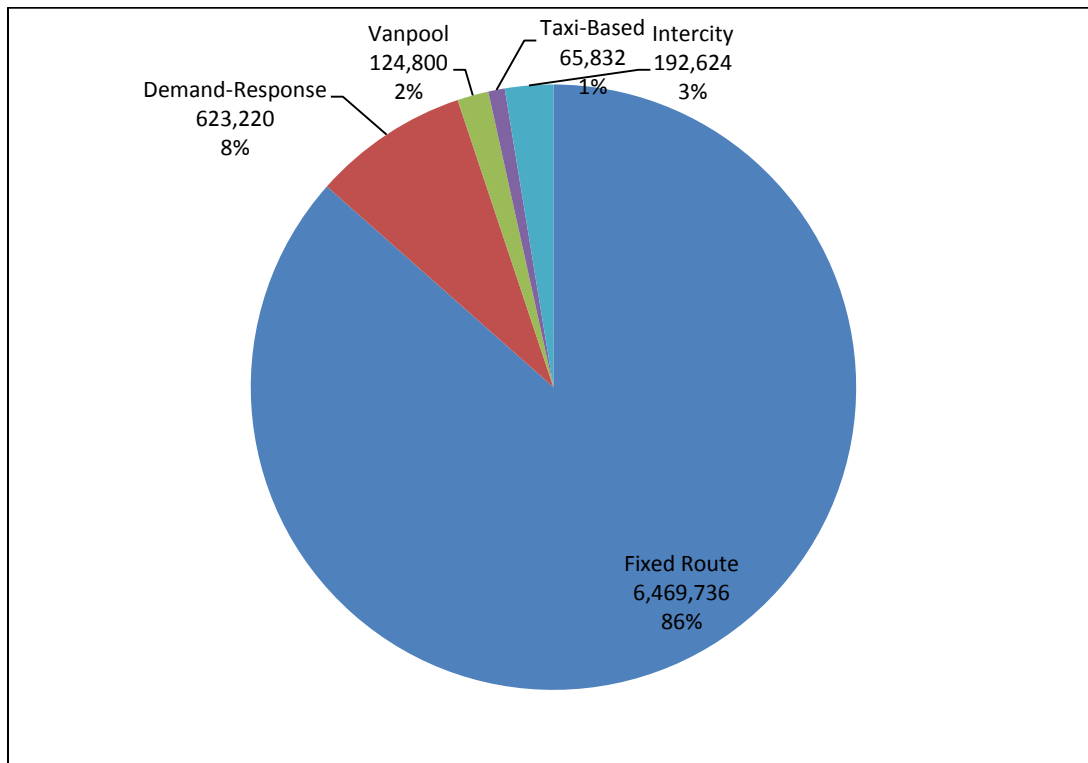


Exhibit 126 describes basic system characteristics (informed by the survey of individual transit providers in the state conducted in 2014) and ridership, while Exhibit 127 shows the locations of these transit services. Total transit ridership by region is shown in Exhibit 128.

Exhibit 126: Public Transportation Services in Alaska

| System   | System Type         | Community Served<br>(General Public unless otherwise noted) | Number of Vehicles Operated <sup>60</sup> | Typical Weekly Ridership           |
|--|---------------------|---|---|------------------------------------|
| <b>Fixed Route Systems</b>                         |                     |   |   |                                    |
| <b>Anchorage Neighborhood Health Clinic (ANHC)</b> | Fixed Route Shuttle | Anchorage Downtown Transit Center to ANHC                   | 2 cut-away vehicles                       | 110                                |
| <b>Bethel Transit System</b>                       | Route deviation     | Bethel  | 4 vehicles                                | 450                                |
| <b>The Bus</b>                                     | Fixed Route         | Ketchikan   | 6 Gillig Low-Floor buses                  | 13,730 (summer),<br>6,066 (winter) |

<sup>60</sup> Vehicle and ridership data from June, 2014 survey of Alaska Transit Systems. Information shown is for transit operations that responded to the survey and does not include all systems in Alaska.

| System  | System Type   | Community Served<br>(General Public<br>unless otherwise<br>noted)  | Number of Vehicles<br>Operated <sup>60</sup>   | Typical<br>Weekly<br>Ridership             |
|---|---|--|--|--|
| <b>Capital Transit</b>                          | Fixed Route   | Juneau   | 18 New Flyer buses   | 22,500                                     |
| <b>Metropolitan Area Commuter System (MACS)</b> | Fixed Route   | Fairbanks  | 21 Gillig buses  | 10,000                                     |
| <b>People Mover</b>                             | Fixed Route   | Anchorage, Chugiak and Eagle River   | 52 40-foot New Flyer buses   | 78,000                                     |
| <b>The RIDE</b>                                 | Fixed Route   | Sitka  | Two 30-foot diesel buses;<br>Two 24-foot gas cutaway buses.  | 1,300                                      |
| <b>Sunshine Transit</b>                         | Route Deviation, Demand-Response  | Talkeetna  | Two 14-passanger buses;<br>One 11-passanger van;<br>One 7-passanger van  | 70   |
| <b>Valley Mover</b>                             | Fixed Route Commuter Service  | Palmer and Wasilla to and from Anchorage   | Seven 40-foot New Flyer buses  | 2,000                                      |
| <b>Intercity Systems</b>                        |   |  |  |  |
| <b>Alaska Railroad</b>                          | Intercity Rail  | Seward, Whittier, Girdwood, Anchorage, Wasilla, Talkeetna, Denali Park, and Fairbanks  | 43 passenger and baggage cars, 1 self-propelled passenger DMU  | 8,500 (summer), 250 (winter) <sup>61</sup> |
| <b>Interior Alaska Bus Line</b>                 | Intercity route deviation between Anchorage, Tok, and Fairbanks. Demand response for Northway-Tok | Anchorage, Palmer, Sheep Mountain, Eureka, Glennallen, Chistochina, Slana, Mentasta Tok, Northway, Dot Lake, Delta Junction, and Fairbanks | Two 2013 GMC Savannas vans (12-passenger);<br>Three 2011 Ford StarTrans cutaways (8 passengers + 1 wheelchair) | 35   |
| <b>Soaring Eagle Transit</b>                    | Intercity Route deviation   | Copper Center, Glennallen, Glukana, Palmer, Anchorage and Valdez   | Five vehicles<br>One 14-passanger cutaway  | 60-70                                      |
| <b>Tetlin Village Council</b>                   | Intercity Route deviation   | Tetlin and Tok   | Two vehicles<br>One 2013 Suburban<br>One 14-passanger cutaway  | 400  |
| <b>Demand-Response Systems</b>                  |   |  |  |  |
| <b>AnchorRIDES</b>                              | Paratransit   | Anchorage, Chugiak and Eagle River ( <i>Seniors and Disabled only</i> )  | 38 cut-away Paratransit vehicles and 14 MV-1 vehicles  | 3,200                                      |

<sup>61</sup> Excludes cruise passengers carried on cruise company passenger cars.

| System   | System Type     | Community Served<br>( <i>General Public unless otherwise noted</i> )  | Number of Vehicles Operated <sup>60</sup>  | Typical Weekly Ridership |
|--|-----------------|---|--|--------------------------|
| <b>Armed Services YMCA</b>                             | Demand-response | Joint Base Elmendorf-Richardson<br>( <i>Military Personnel and their Families only</i> )  | One Dodge Caravan (6-passanger)<br>One Mini Van (15-passanger)   | 355                      |
| <b>Care-A-Van Service</b>                              | Paratransit     | Juneau<br>( <i>Seniors and disabled only</i> )  | 11 paratransit vans  | 675                      |
| <b>Catholic Community Services, Inc.</b>               | Demand-response | Angoon, Craig, Haines, Hoonah, Hydaburg, Kake, Klawock, Klukwan, Saxman, Sitka, Skagway, Wrangell, Yakutat ( <i>Seniors and Disabled only</i> ) | 24 small lift-equipped buses, 2 vans, 4 sedans, 4 eight-seat SUVs. One 16-passenger ER450 Ford cutaway bus | 2,000                    |
| <b>Center for Community, Inc.</b>                      | Demand-response | Sitka ( <i>Seniors and Disabled only</i> )  | 5 cut-away small buses (6 to 12- passenger, plus wheelchair capacity).                                     | 250                      |
| <b>Central Area Rural Transit System, Inc. (CARTS)</b> | Demand-response | Sterling, Kasilof and Nikiski, and the cities of Kenai and Soldotna and surrounding areas, including Funny River and Upper Coho.                | 6 passenger vans, 4 cutaways, 4 minivans   | 880                      |
| <b>Chickaloon Area Transit System (CATS)</b>           | Demand-response | MP 70 to MP 40 of the Glenn Highway Chickaloon to Sutton, Buffalo, Soapstone, and Palmer  | Two Body on Chassis vehicles<br>One Minivan  | 50                       |
| <b>Chugiak Senior Center</b>                           | Demand-response | Chugiak Senior Center ( <i>residents and clients only</i> )   | 5 vehicles   | 64                       |
| <b>Connecting Ties, Inc.</b>                           | Demand-response | City of Valdez ( <i>Seniors, Disabled and Low Income Commuters only</i> )   | 2 vehicles: 1 mini-van, 1 passenger van seats 12   | 115                      |
| <b>Eagle River Connect</b>                             | Demand-response | Chugiak-Eagle River and East Anchorage  | Utilizes AnchorRides fleet   | 90                       |
| <b>Fairbanks North Star Borough</b>                    | Demand-response | Fairbanks ( <i>Seniors and Disabled only</i> )  | 10 Cutaway Vans  | 400                      |
| <b>Fairbanks Resource Agency</b>                       | Demand-response | Fairbanks ( <i>developmentally disabled only</i> )  | 33 Vehicles  | 1,660                    |

| System  | System Type  | Community Served<br>(General Public<br>unless otherwise<br>noted)  | Number of Vehicles<br>Operated <sup>60</sup>   | Typical<br>Weekly<br>Ridership |
|---|--|--|--|--------------------------------|
| <b>Glacier Valley Transit</b>                     | Demand-response  | Girdwood   | 3 Vehicles   | 486 <sup>62</sup>              |
| <b>Love, Inc.</b>                                 | Demand-response  | Fairbanks<br>Volunteer-based, free rides<br>( <i>Love, Inc. Clients only</i> )                                 | Volunteers' Personal Vehicles  | 10                             |
| <b>Mat-Su Community Transit (MASCOT)</b>          | Route deviation, Demand-response, taxi voucher program                 | Matanuska-Susitna Borough<br>(Big Lake, Gateway, Knik-Fairview, Lakes, Meadow Lakes, Palmer, Wasilla, Tanaina) | 17 Cutaways  | 570                            |
| <b>North Star Council on Aging</b>                | Demand response  | Fairbanks ( <i>Seniors only</i> )  | Two Mini Passenger Vans  | 5                              |
| <b>Palmer Senior Citizens Center, Inc.</b>        | Demand-response  | Communities on the road system in the Matanuska-Susitna Borough, and Anchorage ( <i>Senior clients only</i> )  | 29 vehicles  | 550                            |
| <b>SeaView Community Services</b>                 | Demand-response  | Seward and Bear Creek area<br>( <i>SeaView Community Services Clients only</i> ) <sup>63</sup>                 | 10 van-type vehicles   | 115                            |
| <b>Southeast Alaska Independent Living (SAIL)</b> | Demand Response  | Juneau, Ketchikan, Haines, Sitka (SAIL Clients only)   | One 4x4 cutaway bus  | 25                             |
| <b>Sunshine Transit</b>                           | Demand-response  | Trapper Creek Service Area, Caswell MP 85, Willow, Wasilla   | Two 14-passanger buses (with another on order), an 11-passanger van, and a 7-passanger van | 50                             |
| <b>Purchase of Services</b>                       |  |  |  |                                |
| <b>Arctic Access</b>                              | Demand response (Arctic Access contracts with local cab companies)     | Nome ( <i>Seniors and Disabled only</i> )  |  |                                |
| <b>CARTS</b>                                      | Taxi-based demand response (CARTS contracts with local taxi companies) | Homer and Surrounding Areas  | 2 cars, one leased accessible minivan  | 40                             |

<sup>62</sup> Includes only local transit riders

<sup>63</sup> Connects clients to primary and behavioral health care, supported employment, and to the general community services, such as shopping



| System                                 | System Type  | Community Served<br>(General Public unless otherwise noted)   | Number of Vehicles Operated <sup>60</sup>   | Typical Weekly Ridership        |
|--|--|---|---|---------------------------------|
| <b>Connecting Ties</b>                 | Demand response (Connecting Ties contracts with local cab companies)   | Valdez ( <i>Seniors and Disabled only</i> )   |   |                                 |
| <b>Independent Living Center (ILC)</b> | Taxi-based demand response (ILC contracts with local taxi company)   | Homer and Surrounding Areas ( <i>Seniors and Disabled only</i> )  | 2 cab companies, 8 vehicles   | 165                             |
|  |  | Kenai, Soldotna and Central Peninsula Communities ( <i>Seniors and Disabled only</i> )  | Cab company owns 18+ vehicles   | 175                             |
|  |  | Seward and Surrounding Areas ( <i>Seniors and Disabled only</i> )   | 2   | 50                              |
| <b>SAIL</b>                            | Taxi-based demand response (SAIL contracts with Yellow Cab in Ketchikan and Juneau Taxi and Tours in Juneau) | Ketchikan and Juneau ( <i>Seniors and disabled clients of SAIL, low income elderly and disabled enrolled in Juneau taxi voucher program. The ramp-equipped taxis are available for the general public but give priority to elderly and disabled</i> ) <sup>64</sup> | One 7-passenger Sprinter in Ketchikan with two wheel chair stations. Juneau Taxi and Tours has a fleet of approximately 7 taxis owned by the company and 23 driver-owned taxis. | 24 in Ketchikan<br>12 in Juneau |
| <b>Vanpool</b>                         |  |   |   |                                 |
| <b>Share-a-Ride</b>                    | Vanpool  | Anchorage, Chugiak, Eagle River, Girdwood, and the Mat-Su Borough (Palmer, Wasilla, Big Lake)   | 66 Ford F350 13 passenger vans  | 2,400                           |
| <b>Van Tran<sup>65</sup></b>           | Vanpool  | Fairbanks North Star Borough  | 0   | 0                               |

<sup>64</sup> In Juneau, the taxi voucher program provides discounted fares to low income elderly and disabled. In Juneau and Ketchikan, SAIL leases ramp-equipped taxis to taxi companies who enter an agreement to provide priority rides for seniors and people with disabilities.

<sup>65</sup> The vanpool program has just been restarted. As of late 2014 there were no vehicles in service. (FNSB. 8/19/14)

Exhibit 127: Overview of Public Transportation in Alaska

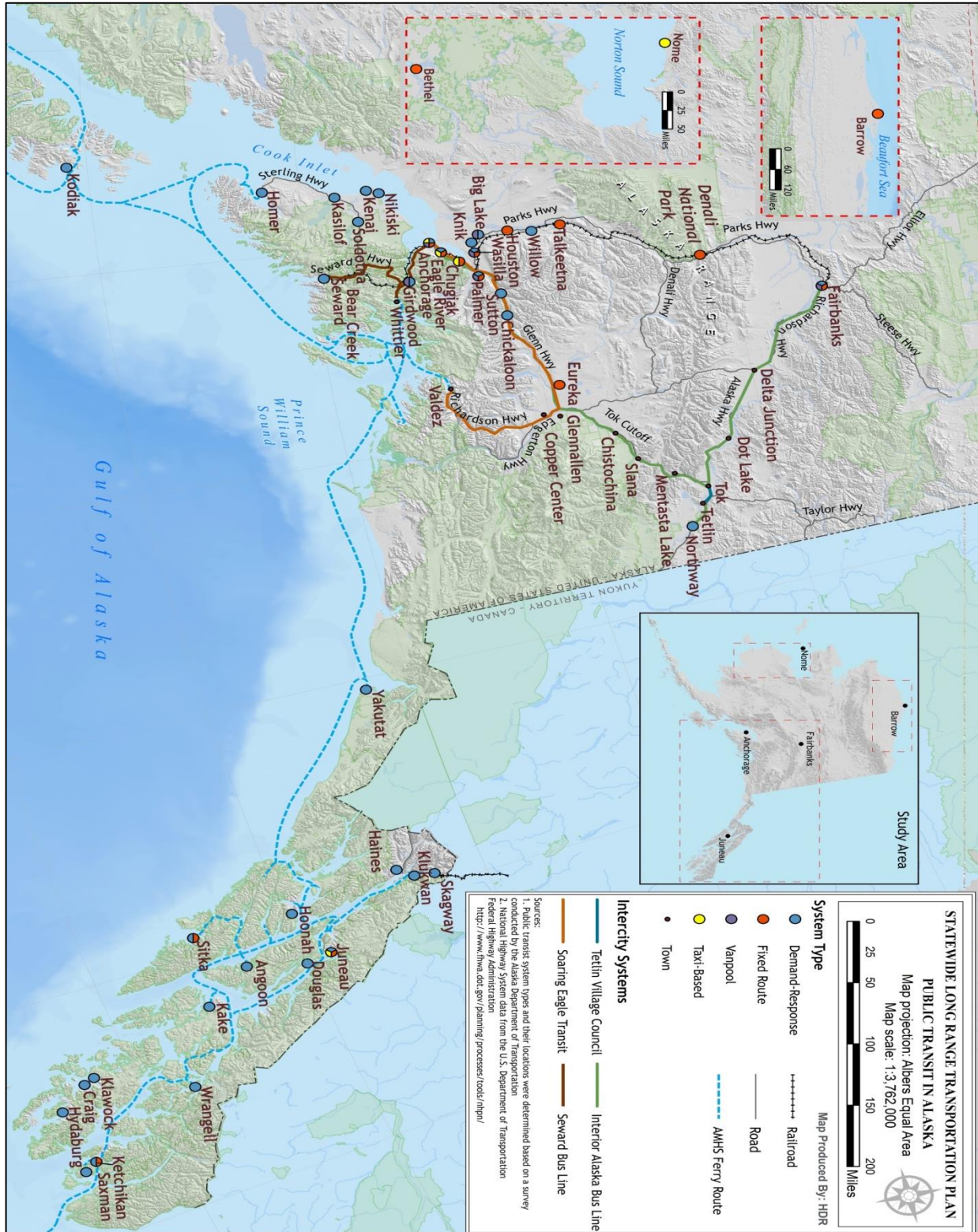


Exhibit 128: Transit Ridership by Region and System Type

| Region       | Number of Annual Unlinked Trips by System Type |                 |               |                |                | Total            |
|--------------|--|-----------------|---------------|----------------|----------------|------------------|
|              | Fixed Route                                    | Demand-Response | Taxi-Based    | Vanpool        | Intercity      |                  |
| Southcentral | 4,162,236                                      | 345,020         | 22,360        | 124,800        | 137,800        | 4,792,216        |
| Southeast    | 1,752,296                                      | 153,400         | 1,872         |                |                | 1,907,568        |
| Interior     | 520,000  | 107,900         | --            | --             | 22,620         | 650,520          |
| Southwest    | 23,400   | 16,900          | --            | --             | --             | 40,300           |
| Far North    | 10,400   | --              | 41,600        | --             | --             | 52,000           |
| <b>Total</b> | <b>6,468,332</b>                               | <b>623,220</b>  | <b>65,832</b> | <b>124,800</b> | <b>160,420</b> | <b>7,442,604</b> |

Source: AKDOT&PF; data is for 2013 or 2014 as available. Excludes the Alaska Railroad.

### Ridership Trends

Overall, among the larger transit systems, ridership increased 2.1 percent between 2009 and 2013 (see Exhibit 129, below). The Anchorage People Mover and Juneau's Capital Transit experienced a slight decrease in transit ridership directly related to reductions in service hours. The Fairbanks area, despite experiencing less population growth than Anchorage, has seen a notable increase in MACS ridership, as has The Bus in Ketchikan, both increasing their passenger trips by approximately 45 percent between 2009 and 2013. This growth is related to an increase in service hours operated and to improved marketing. Changes in MSB were the greatest over the five-year period, with MASCOT seeing a decline in ridership of approximately 44 percent and the startup of the Valley Mover service in 2010. MASCOT attributes the decrease in ridership between 2011 and 2012 to the decision to end commuter service.<sup>66</sup>

Exhibit 129: Transit Ridership Trends and Population Changes 2009 to 2013<sup>67</sup>

| Ridership                                | 2009      | 2010      | 2011      | 2012      | 2013      | Percent Change (2009 to 2013) | Population Change (2009 to 2013) |
|--|-----------|-----------|-----------|-----------|-----------|-------------------------------|----------------------------------|
| <b>People Mover (Anchorage)</b>          | 4,184,141 | 4,145,569 | 4,148,501 | 4,088,549 | 3,986,877 | -4.7%                         | 4.1% (MOA)                       |
| <b>Valley Mover (Mat-Su – Anchorage)</b> | N/A       | 29,613    | 64,743    | 77,621    | 80,446    | - N/A                         | 11.6 % (MSB)                     |
| <b>Mat-Su Community Transit (MASCOT)</b> | 58,987    | 50,815    | 52,169    | 35,384    | 33,068    | -43.9%                        | 11.6% (MSB)                      |
| <b>Capital Transit System (Juneau)</b>   | 1,229,061 | 1,226,286 | 1,252,962 | 1,291,370 | 1,201,223 | -2.3%                         | 6.8% (CBJ)                       |

<sup>66</sup> MASCOT. Email Correspondence 12/19/2014

<sup>67</sup> Note: This table should be used to understand general trends. There are variations in the way (calendar vs fiscal years) each public transit systems records ridership.

| Ridership                  | 2009    | 2010    | 2011    | 2012    | 2013    | Percent Change (2009 to 2013) | Population Change (2009 to 2013) |
|----------------------------|---------|---------|---------|---------|---------|-------------------------------|----------------------------------|
| <b>The Bus (Ketchikan)</b> | 297,917 | 313,646 | 388,892 | 444,151 | 432,599 | +45.2%                        | 3.6% (KGB)                       |
| <b>MACS (Fairbanks)</b>    | 357,816 | 383,649 | 391,799 | 428,166 | 524,301 | +46.5%                        | 3.1% (FNSB)                      |

Sources: *Valley Mover*. 8/20/2014; *KGB*. 9/5/2014; *Capital Transit*. 9/5/2014. National Transit Database. Individual Profiles for All Transit Agencies in Urbanized Areas Over and Under 200,000 Population Alaska.

<http://www.ntdprogram.gov/ntdprogram/data.htm>. 6/20/14; ADL&WD. Population Estimates Research and Analysis. 5/20/14 <<http://laborstats.alaska.gov/pop/popest.htm>

### ***Funding***

This section presents a summary of current Alaska transit funding, as outlined in

Exhibit 130. In Alaska, particularly in small, rural communities, capital funding is critical since harsh weather and lack of storage and nearby maintenance facilities often shorten equipment life. FTA and FHWA programs and grants provide a significant portion of such capital expenditures, but relative to the need, there is less federal funding available to help defray operating costs, which are principally borne by the respective local governments or private-non-profit agencies with federal and state grants providing some support. The State's role for many years was to administer the distribution of federal transit funds to rural Alaska communities. In 2012 and in subsequent years, the Alaska Legislature has appropriated funds to assist local governments with matching federal transit grants. These funds are distributed based on formula to Alaska transit programs to help provide match for capital and operating grants.

#### Federal Funding

Federal funding plays a key role in support of Alaska's public transit. The Alaska Community Transit office is a pass-through entity for FTA funds and manages several transit grant programs that provide capital and operating support. These are generally divided between programs for transit in federally-defined urban areas (Anchorage and Fairbanks) and those for transit in smaller communities.<sup>68</sup> In addition, there are FTA grants for tribal transit and transit for seniors and individuals with disabilities. The FHWA Congestion Mitigation and Air Quality (CMAQ) program is used in Anchorage to fund transit as an air quality improvement strategy.

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<sup>68</sup> Defined in federal statute as 50,000 or more residents in an area with minimum threshold population density.



Exhibit 130: FFY 2014 and State FY 2014 Alaska Transit Funding

|                                    | 5307<br>Urbanized<br>Area | 5310<br>Seniors &<br>Disabled | 5311<br>Rural Area | 5311 (c)<br>Tribal<br>Transit | 5337<br>State of<br>Good<br>Repair | 5339<br>Bus and<br>Bus<br>Facilities | Congestion<br>Mitigation<br>Air Quality | General<br>Funds,<br>Matching | Alaska<br>Mental<br>Health<br>Trust |
|------------------------------------|---------------------------|-------------------------------|--------------------|-------------------------------|------------------------------------|--------------------------------------|---|-------------------------------|-------------------------------------|
| <b>Urban</b>                       |                           |                               |                    |                               |                                    |                                      |   |                               |                                     |
| Anchorage Public Transit           | \$4,767,921               | \$166,453                     |                    |                               |                                    | \$552,925                            | \$2,900,000                             | \$225,000                     | \$236,250                           |
| <b>Small Urban</b>                 |                           |                               |                    |                               |                                    |                                      |   |                               |                                     |
| Fairbanks                          | \$751,937                 | \$61,340                      |                    |                               | \$330,990                          | \$80,521                             |   |                               |                                     |
| <b>Rural</b>                       |                           |                               |                    |                               |                                    |                                      |   |                               |                                     |
|                                    |                           | \$136,166                     | \$7,294,766        |                               |                                    | \$1,250,000                          |   |                               |                                     |
| <b>Small Urban and Rural</b>       |                           |                               |                    |                               |                                    |                                      |   |                               |                                     |
|                                    |                           |                               |                    |                               |                                    |                                      |   | \$675,000                     | \$708,750                           |
| <b>Tribal</b>                      |                           |                               |                    |                               |                                    |                                      |   |                               |                                     |
| Chickaloon Native Village          |                           |                               |                    | \$68,951                      |                                    |                                      |   |                               |                                     |
| Gulkana Village Council            |                           |                               |                    | \$91,168                      |                                    |                                      |   |                               |                                     |
| Ketchikan Indian<br>Community      |                           |                               |                    | \$38,347                      |                                    |                                      |   |                               |                                     |
| Manley Village Council             |                           |                               |                    | \$19,263                      |                                    |                                      |   |                               |                                     |
| Native Village of Crooked<br>Creek |                           |                               |                    | \$2,603                       |                                    |                                      |   |                               |                                     |
| Orutsararmiut Native<br>Council    |                           |                               |                    | \$36,897                      |                                    |                                      |   |                               |                                     |
| Seldovia Village Tribe             |                           |                               |                    | \$1,401                       |                                    |                                      |   |                               |                                     |
| Sitka Tribe of Alaska              |                           |                               |                    | \$79,201                      |                                    |                                      |   |                               |                                     |
| Tetlin Village Council             |                           |                               |                    | \$33,735                      |                                    |                                      |   |                               |                                     |
| <b>Total</b>                       | <b>\$5,519,858</b>        | <b>\$363,959</b>              | <b>\$7,294,766</b> | <b>\$371,566</b>              | <b>\$330,990</b>                   | <b>\$1,883,446</b>                   | <b>2,900,000</b>                        | <b>\$900,000</b>              | <b>\$945,000</b>                    |

Source: DOT&PF. 6/18/2014, MOA 6/14/2014

#### Urbanized Area 5307 Program

Urban (FTA 5307) is a grant program administered by the FTA that is specific to Urban Areas. The grants can be used for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses under certain circumstances. For areas with populations of 50,000 – 199,999 (i.e., Fairbanks), the formula is based on the size of the population, population density, and the number of low-income individuals present. For areas with 200,000 or more (i.e., Anchorage), “the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles, as well as population and population density.”<sup>69</sup> Of the \$14,365,545 apportioned to the Alaska in federal fiscal year 2014 from the FTA, \$4.77 million supported People Mover bus service. The balance, or roughly \$9.6M, was appropriated to the Alaska Railroad.<sup>70</sup>

#### Enhanced Mobility for Seniors and Individuals with Disabilities 5310 Program

This program provides funding to states and urbanized areas for assistance to public and private nonprofit groups in providing transit services to seniors and persons with disabilities in areas where transit service is not provided, insufficient, or does not meet the riders’ needs.<sup>71</sup> Funds are apportioned

<sup>69</sup> <https://www.fta.dot.gov/funding/grants/grant-programs/urbanized-area-formula-program-5307>

<sup>70</sup> FTA.FY 2014 Section 5307 Operating Assistance Special Rule. 12/19/14.

[http://www.fta.dot.gov/documents/Table\\_3-A\\_FTA\\_FY\\_2014\\_Section\\_5307.xlsx](http://www.fta.dot.gov/documents/Table_3-A_FTA_FY_2014_Section_5307.xlsx)

<sup>71</sup> FTA. Transportation for Elderly Persons and Persons with Disabilities (5310). 9/24/14

[http://www.fta.dot.gov/grants/13093\\_3556.html](http://www.fta.dot.gov/grants/13093_3556.html)

based on each state's share of elderly and disabled populations, and are obligated based on the projects included in a statewide grant application. The state is responsible for the distribution of the funds to public and private-non-profit agencies that are eligible and comply with federal requirements. The State of Alaska was apportioned \$151,296 for nonurbanized areas less than 50,000 in population, \$66,155 for urbanized areas 50,000 to 199,999 in population for fiscal year 2014, and the MOA was directly apportioned \$166,453.<sup>72</sup>

#### *Rural Transit 5311 Program*

The FTA 5311 program supports public transit in communities with a population of less than 50,000 by providing formula based grants. An eligible recipient may use the 5311 program funding for capital, operating, and administrative expenses for public transportation projects that meet the needs of rural communities. The state must use 15 percent of its annual apportionment to support intercity bus service, unless the Governor certifies, after consultation with affected intercity bus providers that the needs of the state are adequately met. Alaska received a total of \$7.3 million in 5311 funding in FFY 2014.

#### *Tribal Transit Programs*

FHWA's Tribal Transit Program (TTP) (FTA 5311(c)) was designed to address the transportation needs of Tribal governments, such as the provision of consistent, safe transportation as a means of promoting economic development. Funds are allocated using a formula that takes into account tribal population, road mileage, and average tribal shares of the former Tribal Transportation Allocation Methodology (TTAM) formula.<sup>73</sup>

During FY 2014, FTA's Tribal Transit Program selected 100 projects for \$32 million of Tribal Transit funding. Nine tribal organizations in Alaska were granted \$371,566.

#### *Older Americans Act Title III*

The Older Americans Act (OAA) Title III established authority for grants to States for community planning and social services, in addition to other age-related research, projects, and training.<sup>74</sup> The increased role of Title III in providing transit service began in 2003, when the Administration on Aging (AoA) became a key partner in promoting the coordination of transportation across programs and agencies at the federal level.<sup>75</sup> The OAA grantees have the option to use Title III B funds to meet the match requirements for

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<sup>72</sup> FTA. 2014 Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities and Apportionments. 12/19/14. [http://www.fta.dot.gov/documents/Table\\_8\\_FY\\_2014\\_Section\\_5310.xls](http://www.fta.dot.gov/documents/Table_8_FY_2014_Section_5310.xls)

<sup>73</sup> FHWA. Tribal Transportation Program. Federal Lands Highway. 9/22/14 <http://flh.fhwa.dot.gov/programs/ttp/>

<sup>74</sup> Administration On Aging. Older Americans Act. 9/24/14 [http://www.aoa.gov/AoA\\_programs/OAA/](http://www.aoa.gov/AoA_programs/OAA/)

<sup>75</sup> AOA. Frequently Asked Questions.

[http://www.aoa.gov/AoA\\_programs/OAA/resources/faqs.aspx#Transportation](http://www.aoa.gov/AoA_programs/OAA/resources/faqs.aspx#Transportation)

programs administered by the Federal Transit Administration (FTA). In fiscal year 2014, Alaska received \$6,204,707 in OAA Title III funding.<sup>76</sup>

#### *Medicaid*

This medical insurance program funds transportation by reimbursing Medicaid Waiver and Medicaid transportation providers when they transport eligible individuals to their appointments.<sup>77</sup>

#### *Congestion Mitigation Air Quality (CMAQ)*

Anchorage has consistently programmed a portion of this FHWA program for transit. A small amount of CMAQ funds are programmed annually through the Anchorage Transportation Improvement Program for the ridesharing program and for transit marketing. Both of these activities are primary measures in the State Air Quality Implementation Plan (SIP). Anchorage has also supported using CMAQ funds for transit fleet expansion and replacement, and for bus stop improvements. \$2.9 million was programmed in FFY2014 for these projects.

#### *FAST - The New Federal Transit Program*

Fixing America's Surface Transportation Act (FAST Act) was signed into law by President Obama on December 4, 2015. The law has an effective date of October 1, 2015, applies new program rules to all FY16 funds, and authorizes transit programs for five years (FY16-FY20), through September 30, 2020.

Main features of the Act include the following:

- Provides steady and predictable funding for five years, with funding for FY15, \$10.858 billion, increased to \$11.789 billion for FY16. This is a substantial increase of .93 Billion per year, or 8.6%.
- Re-Introduces a Discretionary Bus Program (\$268 million).
- Phases in increased Buy America requirements, up to 70% by FY 2020.
- Targets funding increases towards improving state of good repair and the bus program.
- Streamlines vehicle procurement & leasing.

Other features of interest include the following:

- Bus Formula (5339(a)) includes a \$1.75 million state allocation; bus discretionary program (5339(b)) re-established.
- Planning program (5304) requirements now include a requirement that the statewide transportation plan must include a description of the performance measures and performance targets and a system performance report evaluating the condition and performance of the transportation system.
- Local governments that operate transit and are eligible to receive urbanized or rural formula grants may now be direct recipients of 5339 funds.

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<sup>76</sup> AARP Public Policy Institute, May 2014. Insight on the Issue 92. The Older Americans Act.

<sup>77</sup> Alaska Department of Health and Social Services. 10/09/14



- Pilot program for Innovative Coordinated Access & Mobility (3006(b)), innovative projects that improve the coordination of transportation services with non-emergency medical transportation services. Limited funding: \$2 million in FY16.
- FTA will develop a best practices guide for 5310 service providers.

State and Local Funding

As mentioned earlier, the State’s role for many years was to administer the distribution of federal transit funds to rural Alaska communities. In 2012 and in subsequent years, the Alaska Legislature has appropriated funds to assist local governments with matching federal transit grants. Altogether, the State Legislature has appropriated \$5,750,000 to public transit in the fiscal years 2012-16 via the Alaska State General Matching Fund. These funds are distributed based on formula to Alaska transit programs to help provide match for capital and operating grants. For the state fiscal year (SFY) 2015, the distribution of funds is described in Exhibit 131.

**Exhibit 131: Alaska State General Funds Distribution for SFY 2015**

| Grant Type                               | Total Recommended State Match | Percent of Total |
|--|-------------------------------|------------------|
| Human Services                           | \$62,508.71                   | 6.3%             |
| Rural Public Transit                     | \$499,047.67                  | 49.9%            |
| Municipalities (Anchorage and Fairbanks) | \$338,443.62                  | 33.8%            |
| State Admin/ ICAP                        | \$100,000.00                  | 10%              |

Source: DOT&PF. 2015. State Legislative Match - \$1Million SFY2015

In the larger communities in Alaska, funds provided by the local government are used to support transit operations. Derived from borough or municipal general funds, the amount is significant compared to funds provided by the State and the federal government, and is critical to ensuring ongoing, consistent transit operations. According to the National Transit Database, 41 percent of the MOA public transportation funding was provided by the local government.<sup>78</sup>

Alaska Mental Health Trust

The Alaska Mental Health Trust Authority funds the Coordinated/Non-coordinated Transportation Program each year for the benefit of all the beneficiaries identified by the Trust Board of Directors, which includes those with mental illness, developmental disabilities, Alzheimer’s and other dementias, chronic alcoholism, and traumatic brain injury. During the 2013 fiscal year, 512 eligible individuals took a total of 38,517 rides provided by the Alaska Mental Health Trust on transit systems in Alaska.<sup>79</sup> AMHTA

<sup>78</sup> Davey, Shane, et al. UAA. 2012. The Sustainability of Public Transportation in Anchorage: People Mover Analysis.

<sup>79</sup> Howard, *op. cit.*, 6/16/2014

provides funding to the State of Alaska for public transportation operating and capital needs that benefit Trust beneficiaries. While 25 percent of the total funding is allocated to the Municipality of Anchorage, the remaining amount is allocated to rural projects.

#### Private Funding

The Rasmuson Foundation is a private foundation that provides grants, totaling approximately \$30 million a year, to support public services that benefit Alaskans.<sup>80</sup> A small portion of the annual allocation goes towards public transit needs. The primary use of the grants has been to purchase vans and ADA-accessible vehicles. These grants are provided through Tier 1 Awards, which are Rasmuson Foundation grants of up to \$25,000 that are dedicated to capital projects, technology updates, capacity building, program expansion, and creative works.<sup>81</sup>

### **Future Characteristics**

The future public transit system will be shaped by a number of trends described below that will impact transit ridership:

#### Demographic Trends

Demographic trends are important indicators for projecting changes in transit needs. A key function of transit systems is the provision of mobility for residents who are unable to drive due to income, disability or age. The senior population in Alaska has seen significant growth in the past few years, driven in part by an aging “baby boomer” generation. By 2027, seniors will comprise 16 percent of the statewide population. Alaska also has a significant population of individuals with disabilities and veterans, both which will drive the need for access to reliable transportation to access employment, health care, and other services in the coming years.

#### Registered Vehicles Increasing, but VMT Flat or Decreasing

Although there has been an 11.74 percent increase in Alaska’s population over the last ten years, the number of state motor vehicle registrations has outpaced population growth (with 23.5 percent increase) and total vehicle miles traveled (VMT) per year has decreased by 2.7 percent. If the population is growing, but VMT is stable, now and into the future, then people will either travel less or use alternative modes, including transit.

#### Effects of Fuel Prices on Transit Ridership

A related trend is the shift to transit among those impacted by higher fuel prices. A study on the impact of rising fuel prices on transit ridership found that, for each one percent increase in fuel prices, transit

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<sup>80</sup> Rasmuson Foundation. *About Us*. Accessed 9/21/14  
<http://www.rasmuson.org/index.php?switch=viewpage&pageid=5>

<sup>81</sup> Ibid.

ridership increased by 0.24 percent—although this only applies to cities with transit systems that were sufficiently extensive to provide a viable alternative to private auto travel.<sup>82</sup> In addition, the recent fall in retail gasoline prices may have reduced transit ridership to some extent.

Projected Levels and Sources of Funding for Public Transportation

The FTA 5309 grant funds, which had been used heavily in the past for transit capital needs, were redesignated in MAP-21 for State of Good Repair and designated for fixed guideway systems. Section 5339 (Bus and Bus Facilities Program), a much smaller funding allocation, was made available for bus transit projects instead. Under the FAST Act, Section 5339 was greatly expanded, and \$696 million was allocated to the program for FY 2016.

**Needs**

*Capital Needs Analysis for the Next Eight Years (2015-2024)*

An understanding of future transit capital needs is critical to planning for future funding. Transit capital needs in Alaska are focused on vehicle replacement, passenger shelters, and maintenance facility improvements. In addition, during the course of our interviews with public transit systems, we received a number of comments regarding anticipated capital needs. These, along with capital needs by jurisdiction, are summarized in Exhibit 132.

Exhibit 132: Capital Needs Analysis for 2015- 2024

| Agency   | Type                 | Number of Buses | Retirement Year                    | Past Funding Sources   | Replacement Cost by Year (\$)                            |
|--|----------------------|-----------------|------------------------------------|--|--|
| <b>Public Transit Agencies</b>                     |                      |                 |                                    |  |  |
| <b>City and Borough of Juneau: Capital Transit</b> | 35' Bus              | 13              | 2016 (3);<br>2018 (4);<br>2022 (6) | Non-Urbanized (FTA 5311), Borough general funds, Local government funds, Capital (FTA 5309), Economic Stimulus (FTA ARRA), Other | 2016 (1,035,000)<br>2018 (1,300,000)<br>2022 (2,497,000) |
|  | Cutaway, Narrow Body | 7               | 2016 (4);<br>2017 (3)              | Non-Urbanized (FTA 5311), Borough general funds, Local government funds, Economic Stimulus (FTA ARRA), Other                     | 2016 (226,000)<br>2017 (213,000)                         |
|  | Other                | 1               | 2016                               | Capital (FTA 5309), Local government funds   | 13,000   |
| <b>Fairbanks North Star Borough: MACS</b>          | 35' Bus              | 13              | 2018 (10)<br>2025 (3)              | Urban (FTA 5307)   | 2018 (3,250,000)<br>2025 (1,248,000)                     |
|  | E-350 Cutaway        | 6               | 2022 (6)                           | Urban (FTA 5307)   | N/A  |

<sup>82</sup> "Impact of Rising Fuel Prices on US Transit Ridership," Ashley R Haire and Randy B. Machemehl in the *Journal of the Transportation Research Board* no. 1992, 2007, pp11-19.

| Agency  | Type                   | Number of Buses | Retirement Year                                     | Past Funding Sources   | Replacement Cost by Year (\$)  |
|---|------------------------|-----------------|---|--|--|
| <b>Gulkana Village Council:<br/>Soaring Eagle Transit</b> | Under 30' Bus          | 1               | 2017  | Tribal Transit Funds   | 61,000   |
|   | Van                    | 1               | 2016  | Tribal Transit Funds   | 40,000   |
| <b>Ketchikan Gateway Borough:<br/>Ketchikan Transit</b>   | 30' Bus                | 4               | 2020  | Advertising, Non-Urbanized (FTA 5311), Borough general funds, Capital (FTA 5309)   | 1,772,000  |
|   | Under 30' Bus          | 2               | 2024  | Economic Stimulus (FTA ARRA)   | 972,000  |
| <b>Municipality of Anchorage:<br/>AnchorRIDES</b>         | Coach                  | 1               | 2018  | N/A  | 35,000   |
|   | Cutaway, Standard Body | 25              | 2016 (10);<br>2018 (15)                             | Urban (FTA 5307), Alaska Mental Health Trust (AMHT)  | 2016 (658,000)<br>2018 (1,050,000)   |
| <b>Municipality of Anchorage:<br/>People Mover</b>        | 40' Bus                | 52              | 2018 (18);<br>2020 (15);<br>2021 (8);<br>2022 (11); | Urban (FTA 5307), FHWA CMAQ funds, Local government funds, and State Capital, Economic Stimulus (FTA ARRA)                         | 2018 (9,000,000)<br>2020 (7,500,000)<br>2021 (4,000,000)<br>2022 (5,600,000) |
|   | Support Vehicles       | 5               | 2018 (2)<br>2021 (3)                                | Urban (FTA 5307), Local government funds   | 2018 (70,000)<br>2021 (136,000)  |
| <b>Sitka Tribe of Alaska</b>                              | Cutaway, Standard Body | 2               | 2016  | Capital (FTA 5309), Tribal Transit Funds   | 68,000 (x2)  |
| <b>Total Replacement Cost 2015-2024</b>                   |                        |                 |   |  | <b>40,812,000</b>  |
| <b>Private Non-Profit Providers</b>                       |                        |                 |   |  |  |
| <b>Central Area Rural Transit System (CARTS), Inc.</b>    | Cutaway, Narrow Body   | 3               | 2016, 2017,<br>2018                                 | Capital (FTA 5309), Alaska Mental Health Trust (AMHT), Economic Stimulus (FTA ARRA), Capital (FTA 5309), Private funding           | 2016 (60,000)<br>2017 (61,000)<br>2018 (60,000)                              |
|   | Van                    | 1               | 2016 (1)  | Capital (FTA 5309), Alaska Mental Health Trust (AMHT), Economic Stimulus (FTA ARRA), Private funding                               | 2016 (45,000)  |
|   | Minivan                | 2               | 2016 (2)  | Capital (FTA 5309), Alaska Mental Health Trust (AMHT),   | 2016 (84,000)  |
| <b>Valley Mover</b>                                       | 40' Bus                | 4               | 2016<br>2020  | Advertising, Non-Urbanized (FTA 5311), In-kind support, Local government funds, Private funding, Rider Fares, Other, Contributions | 2016 (800,000)<br>2020 (800,000)   |
| <b>Total Replacement Cost 2015-2024</b>                   |                        |                 |   |  | <b>1,910,000</b>   |
| <b>Private Non-Profit Providers</b>                       |                        |                 |   |  |  |
| <b>Interior Alaska Bus Line</b>                           | Cutaway, Narrow Body   | 2               | 2016  | Non-Urbanized (FTA 5311), Rider Fares, Medicaid  | 112,000  |
| <b>Total Replacement Cost 2015-2024</b>                   |                        |                 |   |  | <b>112,000</b>   |

| Agency       | Type | Number of Buses | Retirement Year | Past Funding Sources | Replacement Cost by Year (\$) |
|--------------|------|-----------------|-----------------|----------------------|-------------------------------|
| <b>Total</b> |      |                 |                 |                      | <b>42,834,000</b>             |

Note: Table was compiled from a variety of sources. The actual number of vehicles and the replacement costs are continuously in flux.

### Summary of Capital Needs by Year, 2015-2024

The yearly and total sums of the capital needs listed in Exhibit 132 is shown in Exhibit 133. As the needs are predominantly for the replacement of buses, additional capital needs may arise each year. In addition, since new equipment costs are often higher when the actual year of replacement arrives than the transit operators' initial estimate, adding ten to fifteen percent to the annual totals is recommended.

Exhibit 133: Summary of Transit Capital Needs by Year

| Year of Replacement | Estimated Replacement Cost Total |
|---------------------|----------------------------------|
| 2016                | 3,209,000                        |
| 2017                | 335,000                          |
| 2018                | 14,901,000                       |
| 2019                | 0                                |
| 2020                | 10,072,000                       |
| 2021                | 4,000,000                        |
| 2022                | 8,097,000                        |
| 2023                | 0                                |
| 2024                | 972,000                          |
| 2025                | 1,248,000                        |
| <b>Total</b>        | <b>42,834,000</b>                |

### Challenges to Transit Expansion in Alaska

The challenges for future transit expansion in Alaska include:

- *Lack of sufficient funding.* The challenge for all of Alaska's transit systems is maintaining public support and consistent funding with budgets that are determined annually by local assemblies. None of the transit systems in Alaska are operated by a transit district or authority with its own dedicated funding source, which is a common arrangement in other parts of the U.S.
- *Tradition of minimal local taxes and government services.* The tradition in many smaller Alaska communities and the Mat-Su and Fairbanks Boroughs has generally been one of low taxes and limited service. Transit is often seen as an urban service that has been supported, but on a very limited basis.

- *Low population densities* make it challenging to operate fixed-route service productively. Much of Alaska developed after 1970 has grown with low density residential and commercial land uses, where the cost per passenger to operate fixed route transit service is much higher than in areas of high residential and employment density.
- *A focus on the local economy.* Even though over 10,000 Mat-Su residents commute to Anchorage for work, there has been little in the way of transit or other services in support of this large segment of employed Mat-Su residents until recently.<sup>83</sup>
- *Small experienced labor pool.* While drivers and mechanics can be hired and trained on-site, it is difficult to find professional staff with transit experience without recruiting from outside of Alaska. In more remote areas, particularly those off the road systems (e.g., Bethel, Barrow), it is challenging to hire and retain administrative and maintenance staff who have experience with transit operations and the type of supervision required to operate a consistently on-time system.
- *Equipment maintenance* is challenging in the Alaskan environment. The urban areas have benefitted by the construction of enclosed storage and maintenance facilities. Rural and smaller transit operations often have inadequate facilities that were not designed for transit use or in some cases, nonexistent facilities. In addition, trained mechanics in the smaller communities are difficult to locate and hire.

### *Transportation for Residents with Special Needs*

Following the work done by the Governor's Coordinated Transportation Task Force between 2009 and 2012, the Community and Public Transportation Advisory Board (C&PTAB) was established by the Alaska Legislature in 2012. Appointed by the Governor, the Board was charged with preparing a strategic plan to include the mission, objectives, initiatives, and performance goals for coordinated and community transportation in Alaska, and working to improve agency coordination and combining of services to achieve cost savings in the delivery of community and public transportation services. The Board released a plan for its work in April of 2016, which included:

- Implement coordination recommendations
- Implement calculating costs methodology among public transportation agencies and human service transportation providers
- Generate and implement strategies of increased accessible taxicabs in Alaska
- Develop and conduct a pilot to understand challenges, issues and strategies to secure effective coordinated transportation services among local tribes, governments, and providers
- Maintain engagement in transformation of Medicaid system and its effects on transportation specifically, seeking opportunities to infuse coordination strategies

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<sup>83</sup> The number of people commuting between Mat-Su and Anchorage is roughly equal to or exceeds the population of any individual community in Alaska except Anchorage, Fairbanks, and Juneau.

### ***Additional Transit Service Coordination***

Coordination is a way to make scarce capital and operating dollars go farther. There are many forms of transit coordination in Alaska: coordination between adjacent transit operators and many levels of potential coordination among public and private-non-profit human service transportation providers. A significant level of coordination exists between the DOT&PF and the transit operators and stakeholders in the State.

Plan  
Draft

## Ports and Harbors

Alaska ports and waterways provide the transportation corridors for the movement of the majority of the cargo delivered to Alaska, as well as the majority of exports. Access to these waterways is provided by a port or harbor, which is the intermodal facility connecting marine and riverine activity with community activity. Port and harbor facilities are essential to a stable economic base for those communities dependent on marine resource utilization whether to harvest fish, or enjoy recreational use. There are approximately 476 public and private ports and harbors in Alaska with 240 in Southeast and 236 combined in Southwest and Western Alaska, not including barge landing and boat haulout facilities along the riverine communities of the Kuskokwim and Yukon Rivers.

In 2008, the Alaska DOT&PF and the Alaska District Corps of Engineers held the first Alaska Regional Ports Conference bringing together 125 representatives from local, state, and federal government agencies, private transportation businesses, and tribal entities to share visions and concerns about Alaska's waterways and infrastructure.

The overwhelming mandate from this group was the need for ongoing collaboration, comprehensive planning, and leadership to meet Alaska's future needs. Following the Conference, the Alaska DOT&PF commissioned a large study of Alaska's Regional Ports and Harbors which included a baseline assessment of infrastructure needs, strategic trends, regional hub identification, and policy and plan development. The final report of this study is available on the Alaska DOT&PF website at [http://www.dot.state.ak.us/stwddes/desports/assets/pdf/regionalports\\_finalreport0111.pdf](http://www.dot.state.ak.us/stwddes/desports/assets/pdf/regionalports_finalreport0111.pdf).

In May 2011, DOT&PF and the Corps held a 2-day "Alaska Deep-Draft Arctic Ports Planning Charrette" with federal, state, local, and industry representatives to start the process of joint planning for U.S. Arctic Ports in Alaska and addressing deep-draft port needs. The Charrette participants helped shape the scope for the Alaska Deep Draft Arctic Ports Study. As of October 2015, the study has been temporarily suspended (for 12 months). The Corps and its partners are monitoring Arctic activities to determine if there may be the potential for federal interest in continuing the study.



## Railroad

### Concepts and Definitions

Rail is a means of transportation where passengers and goods are moved in wheeled vehicles running on rails. Rail service can be provided by public or private entities. In Alaska, there are two operating railroads. The Alaska Railroad (ARRC) operates 656 miles of track. The ARRC is the only railroad in the US that transports both passenger and freight. The White Pass and Yukon Route Railroad operates approximately 20 miles of track in Alaska and is a narrow gauge, tourist railroad.

Alaska's rail system plays an essential role in transporting goods within as well as to and from Alaska. Much of the food, consumer goods, and special/oversized equipment is shipped to Alaska on container/trailer ship or rail barge and transported to destinations by rail. Rail also provides a cost effective, efficient way to transport heavy bulk commodities such as gravel and coal within the state. There is considerable potential for rail to support resource extraction in much of the state.

### Analysis Approach

*Information for this section came from the draft 2015 Alaska State Rail Plan (ASRP). The ASRP was developed under the guidance of the DOT&PF, which is responsible for rail planning in Alaska. The railroads and DOT&PF apply for federal funding for rail improvement projects. The DOT&PF coordinated with other agencies responsible for rail-related functions in the development of the ASRP. Current Conditions*

DOT&PF's mission is multi-modal in nature and includes statewide rail planning. The ASRP is intended to guide Alaska's role in future rail transportation in Alaska, and it is not intended as a long-term plan for the railroads operating in Alaska.

There are two railroads in this system, the Alaska Railroad (ARRC) and the White Pass & Yukon Road (WP&YR) Railroad (Exhibit 134). The ARRC connects Ports of Seward and Whittier to Fairbanks (passing through Anchorage). In operation since 1923, the ARRC provides both freight and passenger service. It is owned by the State of Alaska but is incorporated and operated like a private business. WP&YR operates between Skagway, AK and Carcross, Yukon Territory. It was built in 1898 during the Klondike Gold Rush. It has been designated an International Historic Civil Engineering Landmark. The WP&YR is privately owned and operated.

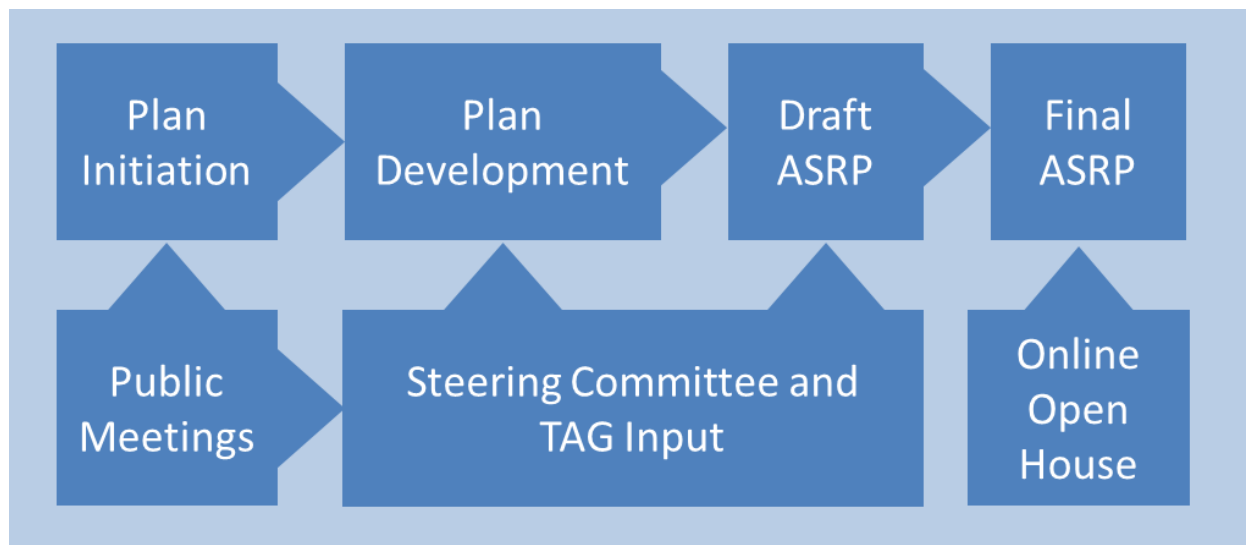
Exhibit 134: Active Railroads in Alaska



The railroads and DOT&PF apply for federal funding for rail improvement projects. The DOT&PF coordinated with other agencies responsible for rail-related functions in the development of the ASRP. An ASRP Steering Committee and a Technical Advisory Group (TAG) were established to ensure that the ASRP development was guided, reviewed, and supported by a wide range of state public agencies and included representation from both public and private transportation and economic development entities in the state.

Both railroads in Alaska were contacted to solicit information about their operations, projects, or other needs as well as their opinions regarding what the public sector could do to assist or improve the efficiency and expansion of rail in the state. Similar interviews were conducted for freight shippers. In addition, a series of seven public meetings were held at different locations around the state to educate stakeholders and the general public regarding the State Rail Plan process, obtain input for developing a rail vision, and provide a forum for discussions of specific rail issues in the state. An online open house was conducted in January 2016 to solicit public input on the draft ASRP. The plan development process is summarized in Exhibit 135.

Exhibit 135: Analysis Approach used to prepare the Alaska State Rail Plan



### Current Conditions

The two active railroads (AARC and WP&YR) in Alaska are not directly connected to each other. The AARC connects with other railroads in the Lower 48 and Canada through port facilities that link marine and land transportation modes.

### Alaska Railroad

The Alaska Railroad was completed and began operations as a federally owned railway in 1923. In 1985, the State of Alaska purchased the railroad, and subsequently operates it as a state-owned corporation. Unlike other state agencies, the ARRC acts as an independent entity that owns and operates the railroad and manages railroad property. The ARRC receives no operating funds from the state and is expected to, and does, generate enough revenue to cover its expenses. It is governed by a seven-member board of directors appointed by the governor.

The ARRC is a Class II railroad.<sup>84</sup> It provides regularly scheduled freight and passenger services between Seward and Fairbanks. These combined services, both regularly scheduled public transportation passenger service and freight service, makes it unique in the U.S. The ARRC is the owner, or has exclusive use easements, of its track in Alaska, and operates a total of 656 miles of track, including 467 miles of mainline, 54 miles of branch line, and 135 miles of yard and siding track. The mainline runs from Seward to Fairbanks. The primary passenger and freight facilities are located in Anchorage, Fairbanks, Seward, and Whittier with other facilities located in Wasilla, Talkeetna, Denali Park, Girdwood, Portage, and South Palmer.

<sup>84</sup> 49 CFR 1201 defines a Class II carrier as having annual carrier operating revenues of less than \$250 million but more than \$20 million after applying the railroad revenue deflator formula.

## Passenger Ridership

The railroad provides six regularly scheduled passenger trains, as well as special event trains and charters. Passenger trains include the *Coastal Classic*, *Glacier Discovery*, *Denali Star*, *Hurricane Turn*, *Aurora*, and *Grandview Cruise* trains.

In 2014, the ARRC carried approximately 468,700 passengers. Just over half (51 percent) of these were cruise ship customers. Prior to 2008 and the onset of the Great Recession, ARRC annual ridership exceeded one-half million. Exhibit 136 presents a summary of ridership from 2007 through 2014. Ridership on tour company cars declined 39 percent between 2007 and 2012. Ridership on ARRC services declined significantly less at 19 percent between 2001 and 2010 before rebounding to nearly 2008 levels in 2012 and reaching a seven year high in 2014.

Exhibit 136: ARRC Passenger Ridership, 2007-2014

| Line                                | 2007           | 2008           | 2009           | 2010           | 2011           | 2012           | 2013           | 2014           |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <i>Denali Star</i>                  | 63,021         | 58,958         | 51,331         | 50,556         | 56,549         | 60,041         | 59,133         | 60,997         |
| <i>Glacier Discovery (Whittier)</i> | 28,047         | 34,397         | 32,597         | 25,373         | 27,911         | 28,921         | 31,294         | 34,912         |
| <i>Coastal Classic (Seward)</i>     | 49,752         | 50,457         | 42,472         | 41,752         | 43,861         | 46,015         | 51,879         | 53,240         |
| <i>Aurora Winter Service</i>        | 3,683          | 3,164          | 3,343          | 3,456          | 3,932          | 4,841          | 6,297          | 7,196          |
| <i>Hurricane Turn (Winter)</i>      | 546            | 771            | 664            | 901            | 1,270          | 1,416          | 1,852          | 1,625          |
| <i>Hurricane Turn (Summer)</i>      | 3,885          | 4,044          | 3,168          | 3,695          | 3,571          | 3,764          | 5,809          | 6,893          |
| Charters/Specials                   | 14,500         | 9,901          | 15,021         | 5,891          | 9,883          | 14,162         | 11,991         | 10,516         |
| <b>ARRC Passengers</b>              | <b>163,434</b> | <b>161,692</b> | <b>148,496</b> | <b>131,624</b> | <b>146,977</b> | <b>159,160</b> | <b>168,255</b> | <b>175,379</b> |
| Tour Companies*                     | 345,430        | 323,838        | 264,376        | 233,160        | 218,916        | 211,159        | 266,105        | 240,588        |
| <i>Grandview Cruise</i>             | 51,735         | 49,997         | 57,814         | 40,351         | 46,419         | 44,960         | 55,285         | 54,733         |
| <b>Total Passengers</b>             | <b>560,599</b> | <b>535,527</b> | <b>470,786</b> | <b>405,135</b> | <b>412,312</b> | <b>415,279</b> | <b>489,645</b> | <b>468,661</b> |

\*Refers to cruise ship passengers being transported in a privately owned railcar. Cruise passengers that are travelling on ARRC owned railcars are listed as part of the statistics for that rail line.

Source: ARRC

Parts of Southcentral Alaska served by the ARRC are not accessible by road. To provide access to these areas, the ARRC offers two whistle stop<sup>85</sup> services). The *Hurricane Turn* service serves the roadless area from Talkeetna north to Hurricane and is often used by residents of the area to get to/from their property. The *Glacier Discovery* service on the Kenai Peninsula provides access to the Grandview-Spencer Glacier area during the summer season in partnership with the Chugach National Forest.

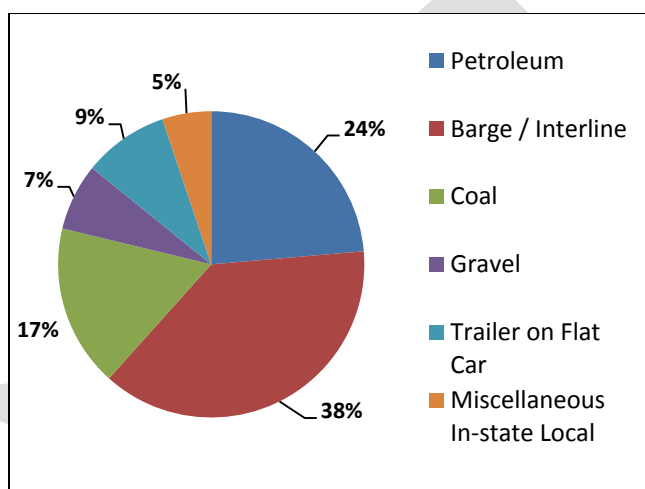
<sup>85</sup> Whistle stop, also known as flag stop, service means the train stops on an as-requested basis. Passengers are able to board/disembark the train anywhere along its route. Passengers are requested to stand apart from the rail along as straight a stretch as possible and attract the Engineer's/Conductor's attention by waving a flag, light, etc.

Freight Movements

ARRC provides rail freight service within Alaska as well as from shipping points in the Lower 48 and Canada to destinations in the state. ARRC-owned port facilities in Seattle, Whittier, Seward, and Anchorage link marine and land routes<sup>86</sup>. Rail yards in Seward, Whittier, Anchorage, and Fairbanks offer centralized distribution hubs. Some rail customers have rail sidings and load/unload directly to rail cars. Others receive trailer or container loads that are trucked for the first and last legs of the trip. The ARRC does not operate scheduled freight service, with the exception of the five-times-weekly train that carries containers from Anchorage to Fairbanks.

Freight comprises more than two-thirds (69 percent) of the ARRC's operating revenues (excluding capital grants). In 2013, the types of freight that generated the most revenue for the ARRC were barge/interline services (38 percent), petroleum (24 percent), and coal (17 percent). Exhibit 137 summarizes the freight types by percentage of freight revenue generated in 2013.

Exhibit 137: AARC Freight Cargo Types by % of Freight Revenue Generated, 2013



Source: ARRC

In 2013, approximately 5.1 million tons of freight were hauled by the railroad. Stone, sand, and gravel were the largest group of commodities moved by weight (approximately 39.6 percent) in 2013 (Exhibit 138). Gravel trains typically bring gravel from extraction sites in the MSB to be processed in Anchorage. The second largest commodity moved by tonnage was coal (27.9 percent). In Alaska, gravel and coal move almost exclusively by rail. The third-largest had been petroleum products (18.5 percent). Jet fuel was loaded on cars at the Flint Hills Refinery in North Pole and off-loaded at the Anchorage fuel rack from where it was piped to Ted Stevens International Airport. In 2013 and early 2014, this movement

<sup>86</sup> The ARRC also receives rail barge service from Prince Rupert, but those facilities are not owned or operated by the ARRC.

was operating at 30 percent capacity due to reduced output from the Flint Hills refinery. Finally, later in 2014, production at Flint Hills stopped altogether. The longest in-state haul made by the ARRC is the transportation of pipe from the Port of Seward to Fairbanks (approximately 470 miles).

Exhibit 138: AARC Freight Movements, 2013

| Freight Type        | Tonnage (millions) | Total Number of Railcar Trips | Number of Railcar Trips Originated | Number of Railcar Trips Terminated |
|---------------------|--------------------|-------------------------------|------------------------------------|------------------------------------|
| Stone, sand, gravel | 2,025              | 20,253                        | 20,253                             | 20,253                             |
| Petroleum Product   | 947                | 12,474                        | 12,474                             | 12,474                             |
| Coal                | 1,427              | 14,615                        | 14,615                             | 14,615                             |
| Chemicals           | 155                | 1,870                         | 0                                  | 1,870                              |
| Iron/Steel Products | 70                 | 1,132                         | 176                                | 956                                |
| Intermodal          | 104                | 6,978                         | 2,233                              | 4,745                              |
| Other               | 382                | 2,115                         | 2,115                              | 2,115                              |
| <b>Total</b>        | <b>5,110</b>       | <b>59,437</b>                 | <b>51,866</b>                      | <b>57,028</b>                      |

Note: "Originated" refers to rail traffic that begins in Alaska and "terminated" refers to rail traffic that ends in Alaska. For example, a railcar of jet fuel transported from North Pole to Anchorage is considered to have originated and terminated in Alaska. A railcar of iron/steel products from the Lower 48 and transported to Alaska via the rail barge is considered to have terminated but not originated in Alaska.

Source: ARRC

### Revenues and Expenses

Revenue from ARRC passenger operations in 2014 totaled \$27.6 million, while operating expenses attributed to passenger operations was \$10.1 million. In 2013, revenue from ARRC passenger operations totaled \$25.7million, while operating expenses attributed to passenger operations were \$9.3 million. For 2012, passenger revenues were \$24.0 million, and expenses were \$9.8 million. Passenger operations in 2013 generated 172,837 revenue train-miles and 6,529 revenue train-hours.

The ARRC is funded by a combination of funding sources. Since 1995, the ARRC has received federal funds from the Department of Defense, Federal Railroad Administration, FTA, FHWA, Transportation Security Administration, and Federal Emergency Management Agency, U.S. Department of Homeland Security, U.S. Forest Service, and other sources such as the American Recovery & Reinvestment Act of 2009 for capital projects. ARRC internal funds (income from the ARRC's passenger, freight, and real estate businesses) are used to match federal grants, fund ongoing expenses, and debt repayment, as well as capital improvements.

### *White Pass & Yukon Route Railroad*

Operated by the Pacific and Arctic Railway and Navigation Company in Alaska, the WP&YR is a narrow-gauge excursion railway.<sup>87</sup> Based in Skagway, Alaska, WP&YR offers trips from Skagway, Alaska to White Pass Summit and Fraser, British Columbia and Carcross, Yukon Territory. It has no connection to any other railroad. WP&YR's season lasts approximately 150 days,<sup>88</sup> with trips starting in early May and ending in late September. The WP&YR has operated in this fashion since 1988 when it reopened after suspending freight operations in 1982. The WP&YR markets itself as the "Scenic Railway of the World" and has been designated as an International Historic Civil Engineering Landmark. Construction of the WP&YR began in 1898 with rail service starting in August 1900.

As of 2013, the WP&YR operated approximately 67.5 miles of single track main line between Skagway and Carcross. Of these, approximately 20 miles<sup>89</sup> are in the United States, and the remainder is in Canada. The WP&YR track is Class II, 3-foot, narrow-gauge track.<sup>90</sup>

#### Passenger Service

During its summer season (May through September), the WP&YR offers regularly scheduled train service with as many as 11 trains per day, including:<sup>91</sup>

- White Pass Summit Excursion – daily service between Skagway and White Pass Summit
- Fraser Meadows Steam Excursion – twice-weekly service between Skagway and Fraser Meadow
- Bennett Scenic Excursion – Tuesday to Saturday service between Skagway and Carcross
- Bennett Backpack Excursion – weekly service between Carcross and Bennett

The WP&YR also offer a small number of special event trains and charters.

#### Ridership

A summary of WP&YR ridership for the period between 2007 and 2014 is included (in

Exhibit 139). Since most of WP&YR's passengers are on cruise-ship tours, ridership declined between 2007 and 2010 as a result of the recession, but ridership has increased since.

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<sup>87</sup> The White Pass & Yukon Route is a wholly owned subsidiary of ClubLink Enterprises Limited. The railway is operated by the Pacific and Arctic Railway and Navigation Company (in Alaska), the British Columbia Yukon Railway Company (in British Columbia), and the British Yukon Railway Company (in Yukon).

<sup>88</sup> The length of the season is linked to the number of days that cruise ships visit Skagway.

<sup>89</sup> The United States-Canadian Border is located at MP 20.4.

<sup>90</sup> This gauge was selected because it permitted sharper curves than standard-gauge track and was not uncommon for railroads in mountainous terrain at the time of the construction of the WP&YR.

<sup>91</sup> WP&YR also offers several train/bus combinations that are not listed separately here because the train component is part of the excursions.



Exhibit 139: WP&amp;YR Monthly Ridership, 2007-2014

|                  | 2007           | 2008           | 2009           | 2010           | 2011           | 2012           | 2013           | 2014           |
|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>April</b>     | -              | -              | -              | -              | 19             | -              | -              |                |
| <b>May</b>       | 63,986         | 57,691         | 48,689         | 49,021         | 46,524         | 48,262         | 50,796         | 52,266         |
| <b>June</b>      | 101,482        | 99,012         | 95,038         | 90,121         | 90,995         | 88,941         | 91,028         | 93,395         |
| <b>July</b>      | 115,999        | 114,913        | 103,027        | 88,257         | 96,386         | 97,371         | 105,330        | 98,061         |
| <b>August</b>    | 113,631        | 102,200        | 92,921         | 89,878         | 100,761        | 98,120         | 94,253         | 98,689         |
| <b>September</b> | 66,290         | 63,844         | 56,461         | 50,925         | 47,356         | 51,907         | 53,051         | 59,730         |
| <b>Total</b>     | <b>461,388</b> | <b>437,660</b> | <b>396,136</b> | <b>368,172</b> | <b>382,041</b> | <b>384,601</b> | <b>394,458</b> | <b>402,141</b> |

Source: WP&YR

### Revenues and Expenses

In 2014, railroad revenues were \$29.4 million, up 5.2% from 2013. Railroad revenues in 2013 totaled \$27.9 million, up 3.2 percent from \$27.1 million the previous year. Rail operating expenses are reported as consolidated with tourism and port operating costs. This figure totaled \$18.4 million in 2014 which was up 1.0% from 2013. In 2013, this figure was \$18.2 million, up 5.2 percent from \$17.3 million in 2012. The majority of operating costs are presumably attributable to rail operations. According to its 2013 Annual Report, WP&YR consistently ranks very high in customer service, with a 96.3 percent passenger satisfaction rate in the year. The WP&YR is privately owned and funded.

### Future Characteristics

The following key findings have emerged from the current rail planning effort:

- Maintenance of a strong and fully functional Alaska Railroad will be important to the future economy of the State.
- Alaska needs its existing railroads to realize its statewide and societal economic development goals, and may require expansion of the rail system to serve other locations and/or new development.
- Railroads are the most efficient means of overland freight transportation, and they allow some forms of development, such as resource extraction, to be economically feasible.
- Alaska's rail systems typically generate sufficient revenue to operate existing service and perform routine maintenance. The downturn in traffic and revenues that began with the recent economic recession has put pressure on the ARRC's ability to earn sufficient revenues to both operate service and adequately maintain the railroad.
- The existing ARRC ownership structure, with the railroad as a state-owned independent corporation, is appropriate and is the best long-term operating strategy of the railroad and the state.



- Additional funding beyond existing revenues is needed for projects that are beyond the scope of ARRC's existing operations such as expanding the rail system to new destinations and capital improvements.

Stakeholders and the general public expressed their interest in the value and potential of the state's passenger and freight rail operations. The key rail freight issues and recommendations expressed during this outreach included the need to:

- Diversify the commodities carried
- Explore future rail extensions/new railroads to support resource development
- Maintain and expand intermodal transport and facilities
- Maintain the existing rail infrastructure

The key passenger rail issues and recommendations included:

- Development of commuter rail in Southcentral Alaska and the Fairbanks areas
- Implementation of Positive Train Control (PTC)

To address these issues and recommendations, the ASRP described the improvements and investments that need to be made in order to address the State's passenger and freight rail needs. The future characteristics of the rail system in Alaska depend on the improvements and investments that are implemented.

## Needs

### *Rail Finance Needs*

Developing a funding strategy to support rail transportation is essential to maintaining and expanding existing services as well as implementing new services. Freight rates are expected to cover the cost of carrying new freight commodities and contribute to the railroad's overhead and profit. A funding strategy can take many forms as demonstrated by experience in other states. The most consistent is a flow of funds for capital support provided by a reliable source. In Alaska, the railroads use their own funds in combination with federal funds to support rail improvements. While state funds have primarily been used to support planning projects and road-rail crossings, these funds have also been used on construction projects such as the Tanana Bridge. In general, Alaska's rail infrastructure shows no major deficiencies that prevents the railroads from operating. However, there are several issues that limit their ability to operate at full potential including:

- PTC requirements
- Deferred maintenance
- Numerous bridges need to be upgraded to meet the 286,000 pound railcar weight limit, the AAR standard
- Tunnel height restricts double-stack service south of Anchorage

- Numerous at-grade crossings
- Speed restrictions due to track curvature near Wasilla and Nenana

To implement the state’s vision, public investment in rail should be directed toward rail-related economic development opportunities (e.g., access to new customers or markets), improving the level of service, and, as opportunities arise, the expansion and coverage of the rail network. A dedicated fund, with the flexibility to direct grants or loans to strategic rail projects on a statewide basis, would provide the state the means and opportunity to address many of the issues noted above over a reasonable period of time.

### Passenger Needs

The ASRP describes the improvements and investments that could address passenger rail needs in Alaska. The passenger needs were divided into three sections: new initiatives, short-term projects, and long-term projects. The ASRP identified two new rail passenger initiatives:

- Commuter Rail is Southcentral Alaska to provide commuter rail between Anchorage and the MSB.
- Establishment of a Regional Transit Authority. In order for regional commuter rail systems to be effective, links between communities must be planned and implemented with coordination between local governments and transit systems, such as the Anchorage People Mover and Mat-Su Transit systems. An RTA makes such coordination possible, along with coordinated support from state, federal, and private sector partners.

### Freight Needs

The determination of future freight needs in Alaska was based on an analysis of existing and projected freight rail traffic movement as well as rail operational and project needs identified during public outreach sessions, railroad interviews, shipper interviews, and steering committee and TAG input (Exhibit 140). The freight needs were categorized into three sections: short-term projects, and long-term projects, and new initiatives.

Exhibit 140: Rail Project Needs Identified in latest Alaska State Rail Plan

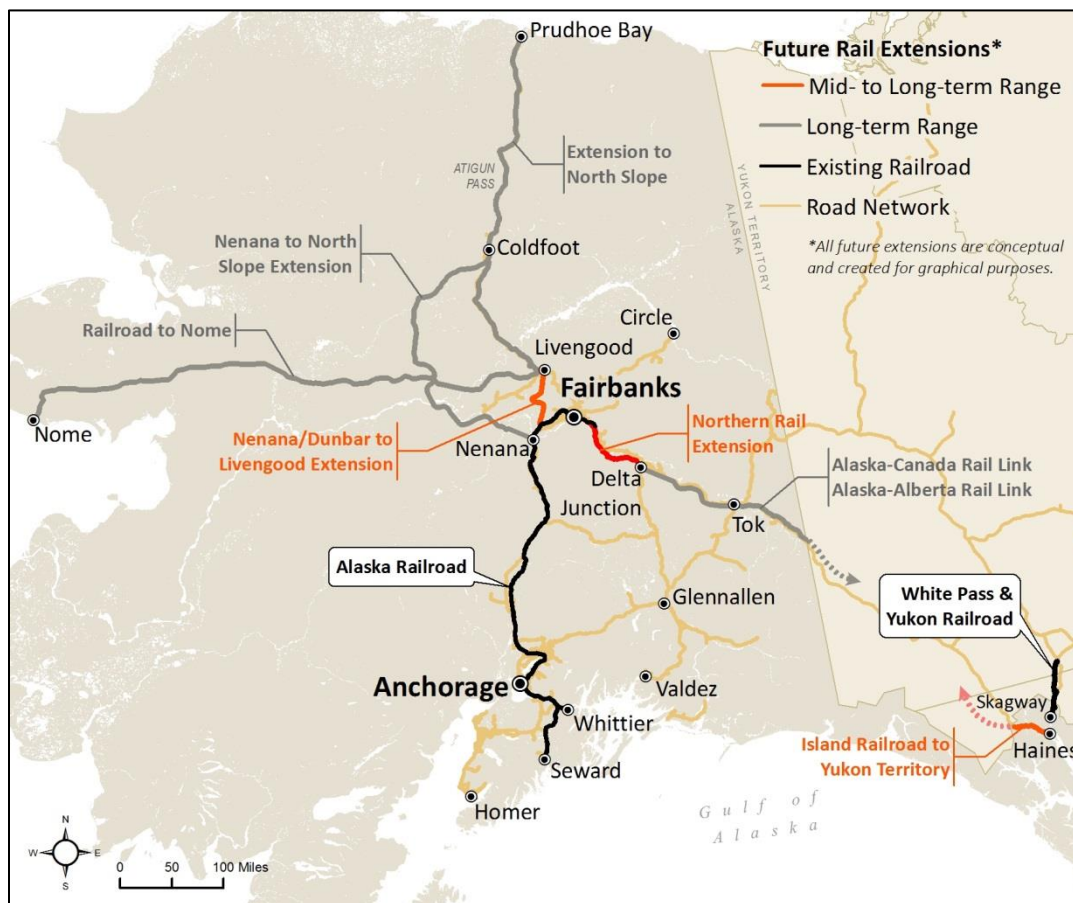
| ID #   | Alternative Name                           | Total Benefits Score | Mandatory | Project Feasibility Score |                   | Total Score |
|--------|--|----------------------|-----------|---------------------------|-------------------|-------------|
|        |  |                      |           | Cost/Complexity           | Project Readiness |             |
| 4.4.1  | ARRC - Positive Train Control              | 37.05                | ✓         | 5.0                       | 10.0              | 52.05       |
| 5.3.15 | Fairbanks Area Rail Plan                   | 101.25               | ✗         | 10.0                      | 0.0               | 111.25      |
| 5.2.1  | ARRC - Seward Marine Terminal Improvements | 80.98                | ✗         | 0.0                       | 5.0               | 85.98       |
| 5.3.3  | ARRC - Whittier Yard Improvements          | 57.01                | ✗         | 10.0                      | 5.0               | 72.01       |

| ID #    | Alternative Name   | Total Benefits Score | Mandatory | Project Feasibility Score |                   | Total Score |
|---------|--|----------------------|-----------|---------------------------|-------------------|-------------|
|         |  |                      |           | Cost/Complexity           | Project Readiness |             |
| 5.2.2   | ARRC - Fairbanks Area Line Relocation - Phase 1                                | 58.39                | ✘         | 5.0                       | 5.0               | 68.39       |
| 4.2.1   | Commuter Rail – Initial Phase  | 65.18                | ✘         | 0.0                       | 0.0               | 65.18       |
| 4.4.2   | USFS - Complete Chugach National Forest Whistle Stop Development               | 42.68                | ✘         | 10.0                      | 10.0              | 62.68       |
| 5.3.6   | Port of Anchorage Track Improvements   | 52.01                | ✘         | 10.0                      | 0.0               | 62.01       |
| 5.3.4   | ARRC - Northern Rail Extension – Phase 2                                       | 59.20                | ✘         | 0.0                       | 0.0               | 59.20       |
| 3.2.1.6 | MSB/ARRC Port MacKenzie Rail Extension (PMRE)                                  | 48.53                | ✘         | 0.0                       | 10.0              | 58.53       |
| 5.2.4   | ARRC - South Wasilla Rail Line Relocation                                      | 43.44                | ✘         | 5.0                       | 10.0              | 58.44       |
| 5.2.5   | ARRC - Nenana Rail Line Relocation   | 43.44                | ✘         | 5.0                       | 10.0              | 58.44       |
| 4.5.4   | WP&YR - Expansion of the Railroad Dock   | 49.87                | ✘         | 5.0                       | 0.0               | 54.87       |
| 4.4.5   | WP&YR - Expand Skagway Depot Passenger Handling Capabilities                   | 36.79                | ✘         | 5.0                       | 10.0              | 51.79       |
| 5.3.7   | ARRC - Fairbanks Airport Branch and Eielson Branch Staging Areas               | 27.68                | ✘         | 10.0                      | 0.0               | 37.68       |
| 5.3.14  | WP&YR - Construction and Expansion of Docking and Port Facilities (West Basin) | 42.05                | ✘         | 5.0                       | 0.0               | 47.05       |
| 5.2.3   | Cantwell Intermodal Facility   | 28.75                | ✘         | 10.0                      | 5.0               | 43.75       |
| 5.3.5   | ARRC - Healy Canyon Stabilization  | 23.44                | ✘         | 10.0                      | 10.0              | 43.44       |
| 5.3.2   | ARRC - Whittier Wharf Replacement and Staging Areas                            | 37.05                | ✘         | 5.0                       | 0.0               | 42.05       |
| 4.5.1   | ARRC - Ship Creek Intermodal Transportation Center                             | 36.79                | ✘         | 5.0                       | 0.0               | 41.79       |
| 5.3.9   | Grade-Separation of All NHS At-Grade Rail Crossings                            | 38.44                | ✘         | 0.0                       | 0.0               | 38.44       |
| 5.3.10  | Grade-Separation of Significant At-Grade Crossings                             | 38.44                | ✘         | 0.0                       | 0.0               | 38.44       |
| 4.4.3   | WP&YR - Passenger Depot Expansion  | 18.39                | ✘         | 10.0                      | 10.0              | 38.39       |
| 5.2.6   | ARRC - Portage and Divide Tunnels  | 19.96                | ✘         | 10.0                      | 5.0               | 34.96       |
| 4.5.2   | WP&YR - Construct a New Intermodal, International Passenger Depot              | 34.91                | ✘         | 0.0                       | 0.0               | 34.91       |
| 5.3.1   | ARRC - Anchorage to Seward Track Rehabilitation                                | 23.44                | ✘         | 5.0                       | 0.0               | 28.44       |
| 4.4.4   | WP&R - Acquire New Passenger Equipment   | 13.39                | ✘         | 5.0                       | 5.0               | 23.39       |
| 5.3.4   | ARRC - Fairbanks Freight Intermodal Terminal Rail/Truck Staging Area           | 13.39                | ✘         | 10.0                      | 0.0               | 23.39       |
| 4.5.3   | WP&YR - Continued Upgrades to Avalanche Control System                         | 6.25                 | ✘         | 10.0                      | 0.0               | 16.25       |
| 5.3.10  | Susitna-Watana Dam Support Spur  | 12.14                | ✘         | 0.0                       | 0.0               | 12.14       |

New freight initiatives were identified because of the considerable interest in developing new rail lines to transport minerals to markets. Potential new mid- and long-term freight rail connections identified in the ASRP included (Exhibit 141):

- Nenana/Dunbar to Livengood Railroad Extension
- Rail Extension to North Slope
- Alaska-Canada Rail Link
- Alaska-Alberta Rail Link
- Island Railroad to Yukon Territory
- Rail Extension to Nome
- Resumption of WP&YR Freight Service

Exhibit 141: Proposed Potential Mid to Long-term Rail Extensions and New Lines



It is important to note that the identification of these freight rail projects does not assure implementation/construction. Additional research and analysis, including economic feasibility studies, are needed to determine which, if any, of these freight rail lines should be built and who should be

responsible for their construction and maintenance. Short and long term passenger and freight rail projects listed in the ASRP are shown in Exhibit 140.

The railroads also maintain their own Capital Improvement Programs (CIP). Projects that are included on the ARRC's 2015 capital program included:

- Northern Rail Extension
- Port MacKenzie Rail Extension
- Ship Creek Area Sewer System Extension
- Coal Loading Facility Improvements
- Dock Expansion & Master Planning/Environmental
- Historic Preservation
- Locomotive Overhauls with Emission Reduction
- Track Rehabilitation
- Embankment Protection
- Bridge Program
- Drainage improvements via culvert repair/replacement
- Positive Train Control
- Flooding Repair
- Vehicle and Equipment Replacement

The CIP from the WP&YR is not publically available.

## Bicycle and Pedestrian Facilities

### Concepts and Definitions

The provision of bicycle and pedestrian facilities is essential to the creation of a safer and more balanced transportation system. Cycling and walking as transportation modes can help reduce congestion, reduce air and water pollution, and improve the quality of life in Alaska.

Bikeways in Alaska can be divided into four basic types:<sup>92</sup>

- **Shared lane (or roadway).** Shared motor vehicle/bicycle use of a travel lane. Typical examples include low-volume residential streets or rural village roads. A sub-type of the shared lane is the wide outside lane, which is an outside travel lane with a width of at least 14 feet (4.2 meters). The wide outside lane is generally not used in Alaska.
- **Bicycle lane.** A portion of the roadway designated by striping, signing, and/or pavement markings for preferential or exclusive use of bicycles. Bike lanes are typically found in urban areas with high motor vehicle and bicycle traffic.
- **Shoulder.** A paved portion of the roadway to the outside of the edge stripe. Shoulder bikeways are more common in rural areas; they accommodate cyclists with few conflicts with motor vehicles.
- **Separated path (or trail).** A facility physically separated from the roadway and intended for non-motorized use. The trail may be within the right-of-way or adjacent to it, or in a greenbelt. Separated trails usually are paved, but they may be unpaved as well. While thin-wheeled bicycles are better accommodated by paved bikeways, unpaved trails are suited for wide-tired bicycles such as mountain bikes as well as other users such as equestrians or walkers.

Pedestrian-oriented transportation facilities are common to all parts of the State's transportation system. These facilities include not only sidewalks, but also view points and rest areas, trails, and bike paths. Other pedestrian-oriented facilities include bus stops and shelters, pedestrian overpasses and underpasses, and restroom facilities at roadside rest areas.

### Analysis Approach

The Bicycle and Pedestrian analysis was based on the statewide bike and pedestrian plan (published in 1995), regional plans, and available pedestrian and bicycle data.

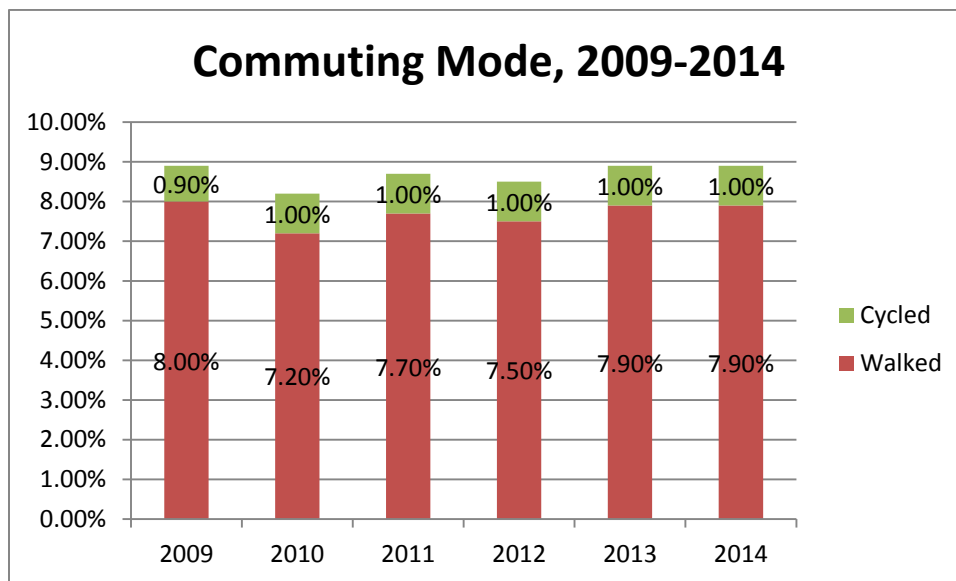
### Current Conditions

Despite Alaska's cold climate, cycling and walking remain viable transportation choices. DOT&PF works to provide safe places to walk and ride bikes for pedestrians and bicyclists traveling between destinations. Exhibit 142 below illustrates the proportion of Alaskans that cycled and walked to work

<sup>92</sup> <http://ntl.bts.gov/DOCS/IGLOO.html>

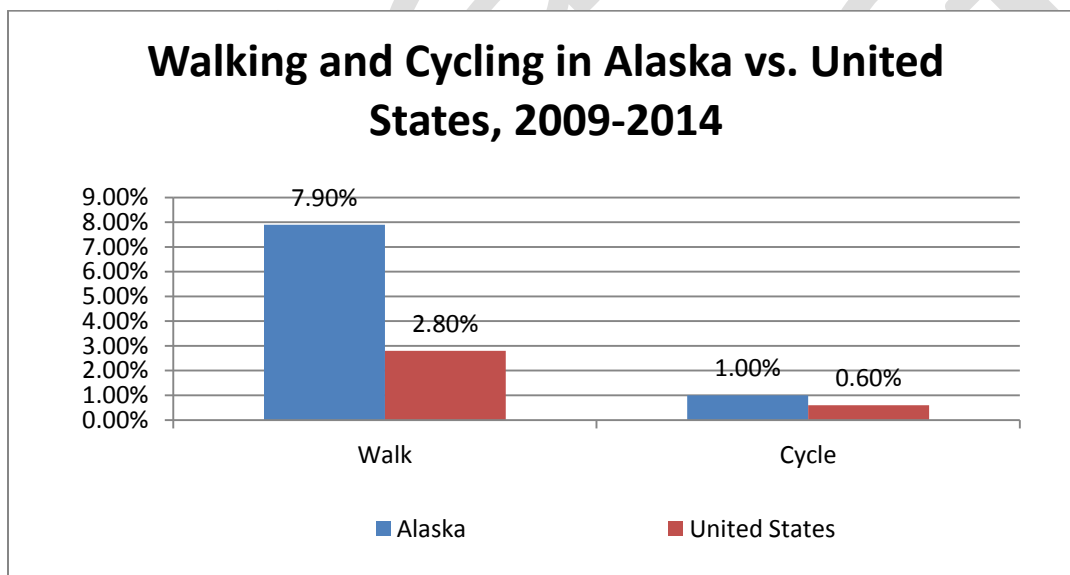
between 2009 and 2014, according to the American Community Survey. More Alaskans walked and cycled to work in 2014 (10.7 percent) than the national average (Exhibit 143). However, this is due in part to the fact that many of the state's residents live in small towns

Exhibit 142: Commuting Mode, 2009-2014



Source: American Community Survey, 2009-2014

Exhibit 143: Walking and Cycling in Alaska vs. United States, 2014



Source: American Community Survey, 2009-2014

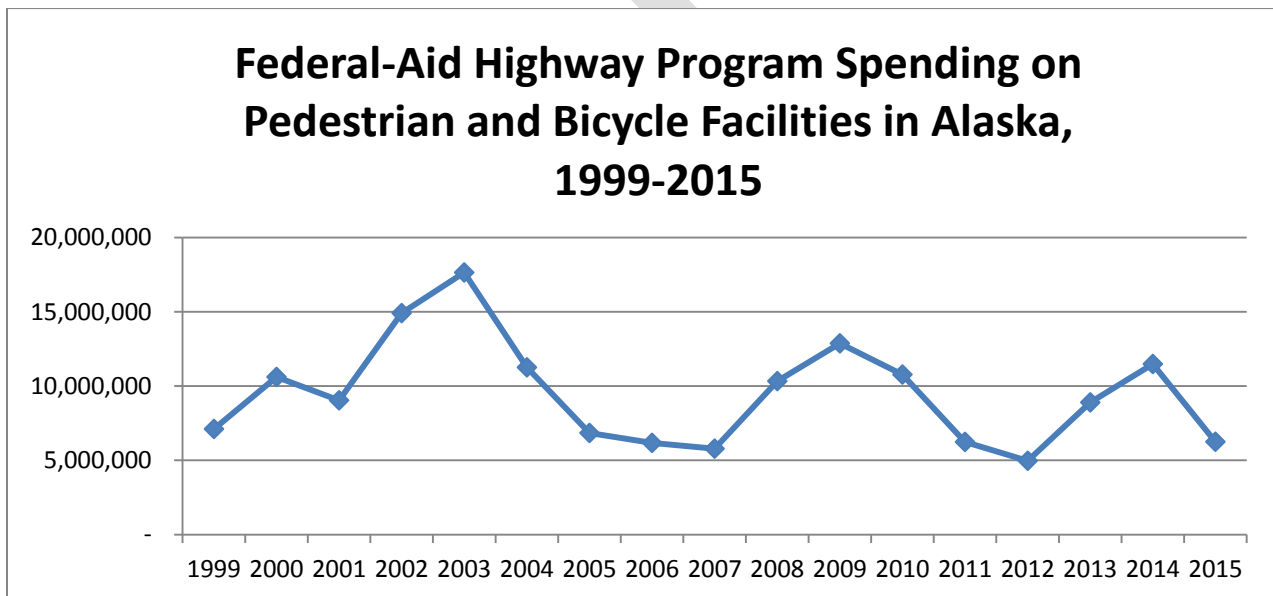
The state does not currently have a comprehensive inventory of bicycle and pedestrian facilities. However, the state's metropolitan regions (e.g., Anchorage, Fairbanks) have inventoried trails, paths, and lanes within their jurisdictions.

While bicycle and pedestrian facilities are essential in both urban and rural areas—there are key differences between them. Urban areas experience higher traffic volumes than rural areas, but rural communities typically have a higher percentage of bicycle and pedestrian users. Rural communities in Alaska are typically smaller and the distances to travel to school, work, and other key destinations are often times shorter than urban areas. Rural areas are less likely to be paved and are more likely to have shared roadways rather than separate trails, lanes, or sidewalks found in urban areas.

### Historical Spending

Exhibit 144 illustrates historical spending for pedestrian and bicycle facilities in Alaska. In 2015, Alaska spent a total of \$6.2 million of Federal-Aid Highway Program funds on pedestrian and bicycle facilities, as compared to \$11.5 million in 2014 (a 46 percent decrease between 2014 and 2015).

Exhibit 144: Federal-Aid Highway Program Spending on Pedestrian and Bicycle Facilities in Alaska, 1999-2015



Source: [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/funding/bipedfund.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm)

### Needs

#### Funding

A more complete pedestrian and bicycle network is needed to not only meet current demands, but also to encourage the use of these modes in the future. While the state and local governments have made significant investments in sidewalks, pathways, bike lanes, wide shoulders, and other provisions in the



past, the Safe Routes to School program, which funded initiatives to make it safer for children to bicycle and walk to school, is no longer nationally administered. Although the law that created Safe Routes to Schools is continuing, dedicated funding to the program has ceased since 2012 and remaining funds are being used.

The Fixing America's Surface Transportation (FAST) Act, which was signed into law on December 4, 2015, has allocated more than \$800 million a year for bicycle and pedestrian funding through the Surface Transportation Program (STP set-aside), formerly known as the Transportation Alternatives Program (TAP). Safe Routes to School and bicycling and walking improvements are all eligible to compete for STP set-aside funding.

**System Development Needs**

System development needs were identified by consolidating all needs identified in the state's regional and metropolitan plans. Since the plans were prepared between 2001 and 2015, each plan's costs were inflated to present the needs in 2014 dollars. An inflation factor of 3 percent per year was used to bring the plan costs up to 2014 dollars. These needs exclude preservation needs, which are accounted for in lifecycle needs.

Non-motorized needs total over \$18.3 million per year, as shown in Exhibit 145 below. A more specific list of bike and pedestrian needs can be found in the regional and metropolitan plans.

**Exhibit 145: Non-Motorized System Development Needs**

| Non-Motorized                     | Cost, 2014 \$*      |
|-----------------------------------|---------------------|
| <b>Regional Plans</b>             |                     |
| Southeast Alaska                  | --                  |
| Southwest Alaska                  | --                  |
| Interior Alaska                   | --                  |
| Yukon Delta                       | --                  |
| Prince William Sound              | --                  |
| Northwest Alaska                  | --                  |
| <b>Regional Plan Subtotal</b>     | <b>--</b>           |
| <b>Metropolitan Plans</b>         |                     |
| Anchorage                         | \$10,000,000        |
| Fairbanks                         | \$2,600,000         |
| Mat-Su Borough                    | \$5,700,000         |
| <b>Metropolitan Plan Subtotal</b> | <b>\$18,300,000</b> |
| <b>System Development Total</b>   | <b>\$18,300,000</b> |

*\*Excludes Preservation, which is accounted for in Lifecycle Needs*

## Needs Summary

Exhibit 146 summarizes the lifecycle management, system development, and routine maintenance needs for highways, bridges, AMHS, Aviation, Public Transportation, and Rail (discussed in more detail in Section 4). DOT&PF acknowledges that these needs exceed revenues and thus cannot be funded through current and projected revenue sources alone—the robust and dynamic set of policies and actions identified in Volume I are meant to provide strategies to help address and bridge this gap.

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Exhibit 146: Summary of System Needs

| Mode                                       | Lifecycle Management Needs (\$)    | System Development Needs (\$) | Routine Maintenance Needs (\$) | Source   |
|--|------------------------------------|-------------------------------|--------------------------------|--|
| Highways - Paved                           | \$450 million annually             | \$308.2 million annually      | \$132 million                  | <p><b>Lifecycle Management and Routine Maintenance Needs:</b> Based on Lifecycle Management Model, as prepared as a part of <i>Let's Get Moving 2030</i>, and updated to account for condition and roadway changes as well as changes to the treatments used by DOT&amp;PF associated costs. For paved roads, calculated by the model using a 3 percent inflation factor and then normalized to calculate needs for future planning. For unpaved roads, calculated based on mileage, treatment cycles, and unit costs for unpaved roads.</p> <p><b>System Development Needs:</b> Identified by consolidating all needs identified from a number of borough/municipal and regional plans that identify project priorities for the development of the transportation system, inflated to present needs in 2014 dollars (using a 3 percent inflation factor).</p> |
| Highways - Unpaved                         | \$13.3 million annually            |                               |                                |  |
| Bridges                                    | Average of \$24.2 million annually | \$1.2 million annually        |                                |  |
| Alaska Marine Highway System <sup>93</sup> | \$598.6 million                    | \$66 million annually         | \$197 million                  | Based on information provided in regional transportation plans, the 2006 AMHS fleet survey, and the 2016-2019 STIP.  |

<sup>93</sup> Does not account for the eventual need to replace M/V Aurora (now 39 years old), M/V Columbia (now 42 years old) and M/V LeConte (now 42 years old) since these vessels may not be replaced in-kind depending on future traffic patterns. Routine maintenance costs are not annualized as these will change substantially once vessels are replaced.

| Mode                  | Lifecycle Management Needs (\$)                       | System Development Needs (\$) | Routine Maintenance Needs (\$) | Source   |
|-----------------------|---|-------------------------------|--------------------------------|--|
| Aviation              | Average of \$93 million annually                      | \$9.3 million annually        | \$33.4 million annually        | Based on Lifecycle Management Model, as prepared as a part of <i>Let's Get Moving 2030</i> , and updated to account for condition and roadway changes as well as changes to the treatments used by DOT&PF associated costs; historical cost information for routine maintenance; and information provided in regional transportation plans |
| Public Transportation | Available through existing transit provider plans     |                               |                                |  |
| Rail                  | Available through Draft Alaska State Rail Plan (ASRP) |                               |                                |  |

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## FINANCE OVERVIEW

Transportation funding in Alaska is a combination of federal funds, state general funds, and AMHS revenues. Of these, the federal highway program funds form the majority of the available funds. Uncertainty over federal funds has been a major source of concern for state DOTs around the country, but more so for Alaska DOT&PF, which is heavily reliant on those funds. After more than a decade of no reliable source, the U.S. Congress finally passed a long term transportation bill with associated funding. The Fixing America's Surface Transportation (FAST) Act, signed into law December 4, authorizes Federal highway, highway safety, transit, and rail programs for five years (Exhibit 147).

Federal funding is up 5.1% from FFY 2015 levels, and increases about 2% per year thereafter by supplementing the Highway Trust Fund's gas tax revenue with federal funds from a variety of sources. Alaska's FFY 2016 apportionment is \$508.6 million, an increase of \$24.7 million over FFY 2015. The State will be eligible to receive over \$2.6 billion through 2020. The FAST Act focuses on the importance of goods movement to the U.S. economy by establishing a new program for highway freight projects. It continues the focus of the previous transportation bill, MAP-21 (Moving Ahead for Progress in the 21st Century) on the National Highway System, safety, performance measures and asset management.

The FAST Act is good news for Alaska, providing a stable source of funding for transportation infrastructure for the next five years. That said, the current and forecast levels of funding are still lower than those required to meet all identified needs, and will therefore require making some difficult decisions in the future – similar to the last decade.

Exhibit 147: FAST ACT Funding for Alaska during FY 2016-2020 (in billions)

