



## Appendix A: Literature Review

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### FMATS Freight Mobility Plan

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## Acronyms and Abbreviations:

ADG	Aircraft Design Group
AEA	Alaska Energy Authority
AIAS	Alaska International Airport System
AIDEA	Alaska Industrial Development and Export Authority
ARRC	Alaska Railroad Corporation
BLS	Bureau of Labor Statistics
DOT&PF	Alaska Department of Transportation and Public Facilities
EA	Environmental Assessment
EHS	Extremely Hazardous Substances
FAF	Freight Analysis Framework
FAI	Fairbanks International Airport
FHWA	Federal Highway Administration
FMATS	Fairbanks Metropolitan Area Transportation System
FMP	Freight Mobility Plan
FNG	Fairbanks Natural Gas
FNSB	Fairbanks North Star Boroughnorth
FRA	Federal Railway Administration
HS	Hazardous Substances
IEP	Interior Energy Project
LNG	Liquefied Natural Gas
LQ	Location Quotient
L RTP	Long-Range Transportation Plan
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
PEL	Planning Environmental Linkages
Profile	Freight Mobility Profile
SWOT	Strengths, Weaknesses, Opportunities, and Threats
WP&YR	White Pass & Yukon Route

# Introduction

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In support of the Task 3: Data Collection, Inventory, and Assessment of the Alaska Department of Transportation and Public Facilities (DOT&PF) Freight Mobility Plan (FMP), a Freight Mobility Profile (Profile) was prepared. This Profile is based on a detailed literature review of relevant planning documents that have local, regional, and state reports, studies, and data related to freight activity, movements, land uses, and industries in Fairbanks and the North Pole area. The documents reviewed for this Profile are presented in the following sections and were used to support the preparation for the Task 5: Existing Conditions Report.

## Sources Reviewed

While all relevant sources were reviewed, this section focuses on the most recent documents and relevant freight information.

### Freight Data Sources

The following freight data sources were reviewed, documented, and incorporated into the Existing Conditions Report of the study:

- United States Census Bureau Summary File 1 (2016);
- Bureau of Labor Statistics (BLS) Location Quotients (LQ; 2016a);
- BLS (2014);
- Monthly Regional Employment Statistics (2005, 2015; Alaska Department of Labor and Workforce Development, 2016);
- Historical Fairbanks International Airport Air Cargo Data (2001-2015; PDC Engineers, Inc., 2014; Fairbanks North Star Borough [FNSB], Community Planning Department, Community Research Center, 2015a and 2015b);
- Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) Data (FHWA, 2016);
- Alaska Railroad Corporation (ARRC) Annual Freight Tonnage and Revenue (2008-2014; FNSB, Community Planning Department, Community Research Center, 2015a and 2015b); and
- Annual Traffic Volume Report (DOT&PF, 2015)

### Freight Reports and Studies

Local, regional, and state reports, plans, and studies were reviewed a summarized below.

- Fairbanks Metro 2040 – A Roadmap to 2040 (Kittelson & Associates, Inc., 2015);
- Fairbanks Area Line Relocation Study (Thomas Engineering and Petrarovich, Nottingham & Drage Inc., 2001);
- North Pole Road/Rail Reduction Project Environmental Assessment (ARRC and DOWL HKM, 2012);
- Fairbanks North Star Borough Regional Comprehensive Plan (FNSB, 2005);

- Statewide Hazardous Materials Commodity Flow Study (Alaska Department of Environmental Conservation, 2010);
- North Pole Land Use Plan (FNSB, 2010);
- City of North Pole Comprehensive Strategic Plan (City of North Pole, 2016);
- Fairbanks International Airport Master Plan (PDC, Inc., 2014);
- Analysis of Alaska Transportation Sectors to Assess Energy Use and Impacts of Price Shocks and Climate Change Legislation (University of Alaska Anchorage, Institute for Social and Economic Research, 2013);
- Fairbanks North Star Borough 2012 Gas Distribution System Analysis (Northern Economics, 2012);
- Interior Energy Project – Feasibility Report (Alaska Industrial Development and Export Authority [AIDEA] and Alaska Energy Authority [AEA], 2013);
- Interior Energy Project Economic Impact Analysis (Cardno Entrix, 2014);
- Interior Energy Project – Alaska State Legislature Quarterly Report (AIDEA, 2016);
- Richardson Highway/Steese Expressway Corridor Planning Environmental Linkages Study Report (DOWL, 2015);
- Alaska State Rail Plan Update (HDR, Inc. with CDM Smith, 2015) – DRAFT;
- Alaska Long – Range Transportation Plan Update, Freight Element (2016) –DRAFT; and
- Alaska Aviation System Plan (DOWL HKM, 2008).



# Freight Data Sources

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## 1 United States Census Bureau Summary File 1

### 1.1 Conducted By

United States Federal Government, Decennially, 2010

### 1.2 Summary

The U.S. Census Bureau conducts nationwide data collection on population, demographics, households, income, and other information. The Census is used by policy makers to determine various issues, from congressional district sizes to capital funding allocations and social programs, and identify current trends for a particular neighborhood. Within the FNSB, the total population has increased by 17 percent from 2000 to 2010. Although the average household sized has decreased, there are more total households in the city (22.3 percent increase) in 2010 compared to 2000 (Table A-1).

**Table A-1 - FNSB Population and Housing Data Summary 2000-2010**

<b>Data Type</b>	<b>2010</b>	<b>2000</b>	<b>% Increase 2000-2010</b>
<b>Total Population</b>	97,581	82,840	17.8%
<b>Total Households</b>	36,441	29,777	22.3%
<b>Owner-Occupied Households</b>	21,410	16,066	33.3%
<b>Renter-Occupied Households</b>	15,031	16,711	-10.1%
<b>Average Household Size</b>	2.41	2.68	-10.1%
Source: U.S. Census Bureau, 2016			

### 1.3 Applicability to FMP

Socioeconomic data from the U.S. Census can provide critical indicators of goods movement in a region. When more people move or locate to a region, consumer demand for various goods increases. Existing social/economic population demographics in Fairbanks help freight policy makers determine how much growth and freight demand to prepare for in the future.



## 2 Bureau of Labor Statistics (BLS)

### 2.1 Conducted By

United States Federal Government, Annually, 2014

### 2.2 Summary

The BLS conducts a Quarterly Census of Employment and Wages to determine location quotients (LQs) of each industry in the FNSB compared to Alaska and the United States. The latest FNSB LQs from 2014 were used because they provided the most relevant information for the FMP (Table A-2).

According to the LQs, Mining, Quarrying, and Oil/Gas Extraction is a major employment industry in the FNSB and Alaska compared to the rest of the United States. Other major employment industries within the FNSB include Utilities and Transportation and Warehousing. These industries, especially resource extraction, require the movement of goods. The primary goods moved through the Fairbanks region are petroleum products, coal, and heavy equipment, which are sent north to the oil fields production and operations.

**Table A-2- Fairbanks Location Quotients for 2014**

Industry	Fairbanks North Star Borough	Alaska (Statewide)	United States (Total)
<b>Base Industry: Total, All Industries</b>	1.00	1.00	1.00
<b>Agriculture, Forestry, Fishing, and Hunting</b>	0.14	0.40	1.00
<b>Mining, Quarrying, and Oil/Gas Extraction</b>	7.36	9.57	1.00
<b>Utilities</b>	3.08	1.75	1.00
<b>Construction</b>	1.84	1.27	1.00
<b>Manufacturing</b>	0.22	0.54	1.00
<b>Wholesale Trade</b>	0.56	0.51	1.00
<b>Retail Trade</b>	1.32	1.09	1.00
<b>Professional and Technical Services</b>	0.69	0.81	1.00
<b>Management of Companies and Enterprises</b>	0.25	0.63	1.00
<b>Administrative and Waste Services</b>	0.41	0.65	1.00
<b>Educational Services</b>	0.33	0.39	1.00
<b>Health Care and Social Assistance</b>	1.20	1.11	1.00
<b>Transportation and Warehousing</b>	1.93	2.01	1.00
<b>Information</b>	0.72	1.04	1.00



<b>Finance and Insurance</b>	0.53	0.56	1.00
<b>Real Estate and Rental and Leasing</b>	1.09	1.09	1.00
<b>Arts, Entertainment, and Recreation</b>	0.97	1.04	1.00
<b>Accommodation and Food Services</b>	1.30	1.07	1.00
<b>Other Services, Except Public Administration</b>	0.92	1.09	1.00
<b>Unclassified</b>	1.01	1.28	1.00
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2016a			

### 2.3 Applicability to FMP

The LQs provide important information in determining which industries are significant to the region’s economy. Policy and decision-makers can identify which industries require more freight activity than others. In the case of FNSB, Mining, Quarrying, and Oil/Gas Extraction requires significant use of the freight system, whereas other major LQs like Information sector, which encompasses producing, distributing, and processing data and communications, may not have as high a need for a more developed freight system.

## 3 Monthly Regional Employment Statistics

### 3.1 Conducted By

Alaska Department of Labor and Workforce Development, 2005 and 2015

### 3.2 Summary

Monthly regional employment estimates are produced by state economists using historical trends and current data from a sample of employers in the region. The data can provide critical information to changes in industry through determining total employment. From this, the data can illustrate which major sectors have either grown or shrunk using 2005 and 2015 industry data (Table A-3 and Figure A-1).

Regional employment within the FNSB increased by 2 percent between 2005 and 2015. The industries that represent the most significant rate of growth included Mining and Logging and Education and Health Services. However, although the percent change may be high, the actual numbers for increased employment may actually be small (see Mining and Logging).

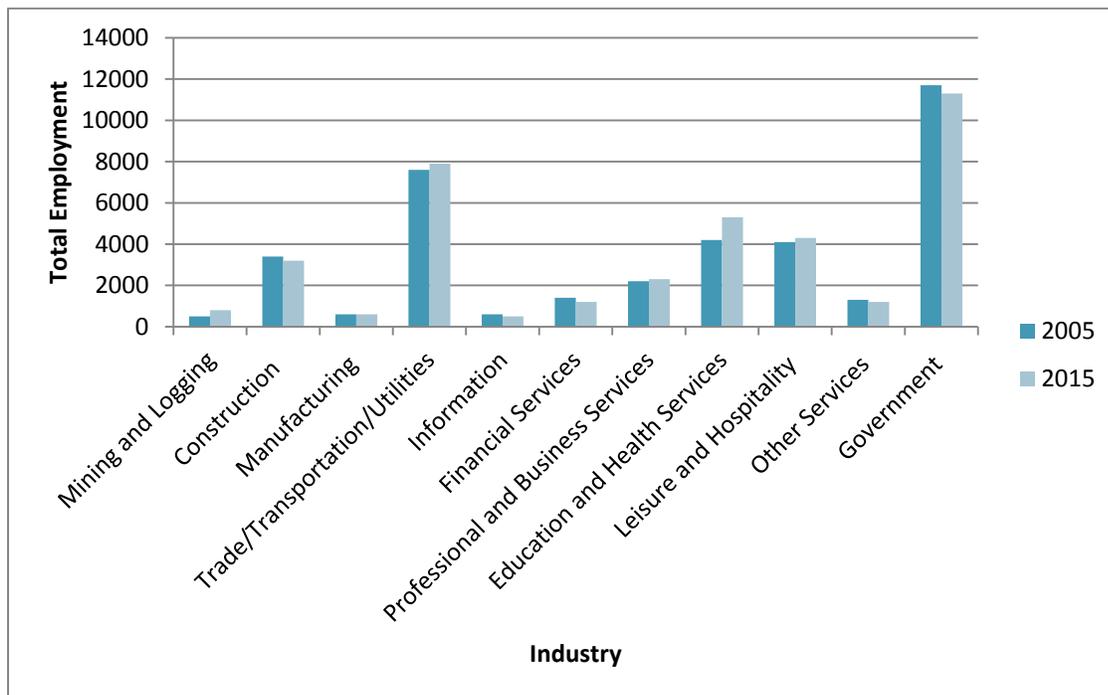


Table A-3 - FNSB Employment by Industry for 2005 and 2015

Industry	2005	2005 Percent Industry Employers	2015	2015 Percent Industry Employers	Percent Change, 2005-2015
<b>Total Employment</b>	37,600	100%	38,500	100%	2%
<b>Mining and Logging</b>	500	1.30%	800	2.08%	60%
<b>Construction</b>	3400	9.00%	3,200	8.31%	-6%
<b>Manufacturing</b>	600	1.60%	600	1.56%	0%
<b>Trade/Transportation/Utilities</b>	7,600	20.00%	7,900	20.52%	4%
<b>Information</b>	600	1.60%	500	1.30%	-17%
<b>Financial Services</b>	1,400	3.70%	1,200	3.12%	-14%
<b>Professional and Business Services</b>	2,200	5.85%	2,300	5.97%	5%
<b>Education and Health Services</b>	4,200	11.10%	5,300	13.77%	26%
<b>Leisure and Hospitality</b>	4,100	10.90%	4,300	11.17%	5%
<b>Other Services</b>	1,300	3.46%	1,200	3.12%	-8%
<b>Government</b>	11,700	31.12%	11,300	29.35%	-3%

Source: Alaska Department of Labor and Workforce Development, 2016

Figure A-1 – FNSB Employment Levels by Industry, 2005-2015





### 3.3 Applicability to FMP

This data is helpful to illustrate the change in demand for employment, which can affect freight mobility and goods movement. The increase in mining and logging is minor based on the data but may potentially bring more freight-oriented work to the region, whereas a decrease in Information could mean less goods related to communications, both of which affect freight transportation in different ways.

## 4 Historical Fairbanks International Airport Air Cargo Data

### 4.1 Conducted By

PDC Engineers Inc. 2014; Fairbanks North Star Borough, Community Planning Department, 2015

### 4.2 Summary

The historical air cargo at Fairbanks International Airport (FAI) summarizes the amount of enplaned, deplaned, transit, and total cargo that come through FAI (Table A-4). This information is relevant to the study because it illustrates how much cargo by air is transported through the airport, which can, in turn, be used to determine future air freight trends.

**Table A-4 - Historical Air Cargo at FAI (Tons), 2001 – 2015**

Year	Enplaned Cargo	Deplaned Cargo	Transit Cargo	Total Cargo <sup>1</sup>
2000	27,421	6,777	128,009	290,216
2001	24,444	6,350	130,239	291,272
2002	27,053	7,267	134,010	302,340
2003	26,402	8,576	99,584	234,146
2004	29,983	8,900	86,794	212,471
2005	30,166	6,740	74,303	185,512
2006	25,842	5,496	18,011	67,360
2007	20,595	5,599	4,352	34,898
2008	17,361	5,423	6,939	36,662
2009	18,436	6,705	9,462	44,065
2010	16,958	4,954	8,240	38,392
2011	16,289	4,232	2,119	24,759
2012	19,077	3,665	2,449	27,640
2013	16,411	3,498	1,848	23,604
2014	16,295	3,644	986	21,910
2015	18617	3,538	277	22,708

Source: PDC Inc. Engineers, 2014 (2000-2011 data); FNSB, Community Planning Department, 2015a and 2015b (2012-2015 data)  
 Note: numbers may vary due to rounding  
<sup>1</sup> Total Cargo calculated as Transit Cargo, multiplied by two (inbound and outbound), plus Enplaned Cargo and Deplaned Cargo.



### 4.3 Applicability to FMP

Historical air cargo data is important to helping freight policy decision-makers determine many important issues such as increasing funding support and lobbying, increasing freight intermodal options, building additional cargo facilities, and building various other airport improvement projects. This data can be used to develop policies related to air freight in the FMP.

## 5 Freight Analysis Framework (FAF) Data

### 5.1 Conducted By

Federal Highway Administration, 2015

### 5.2 Summary

The 2015 FAF was prepared using FHWA data (FHWA, 2016). The FAF Version 3 reflects the 2015 Commodity Flow Survey conducted as a part of the U.S. Economic Census. This data is represented at the statewide level (Figure A-2 through Figure A-5).

Figure A-2 - Alaska's 2015 Statewide Commodity Flows by Mode - Weight

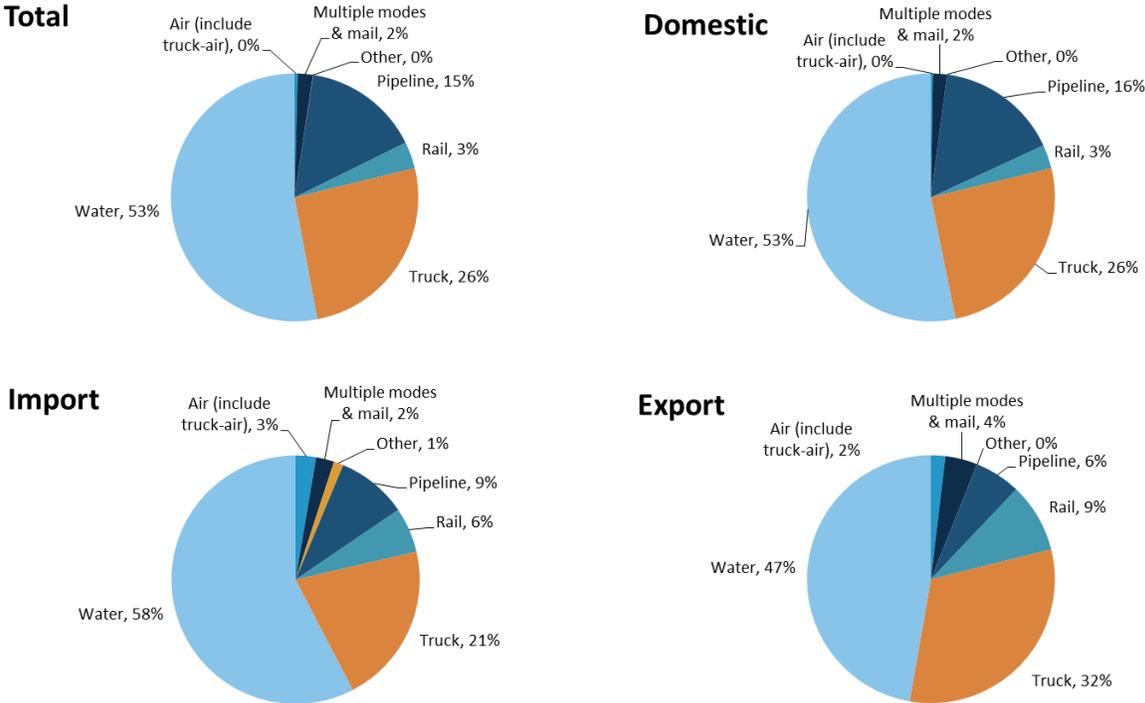




Figure A-3 - Alaska 2015 Commodity Value by Mode

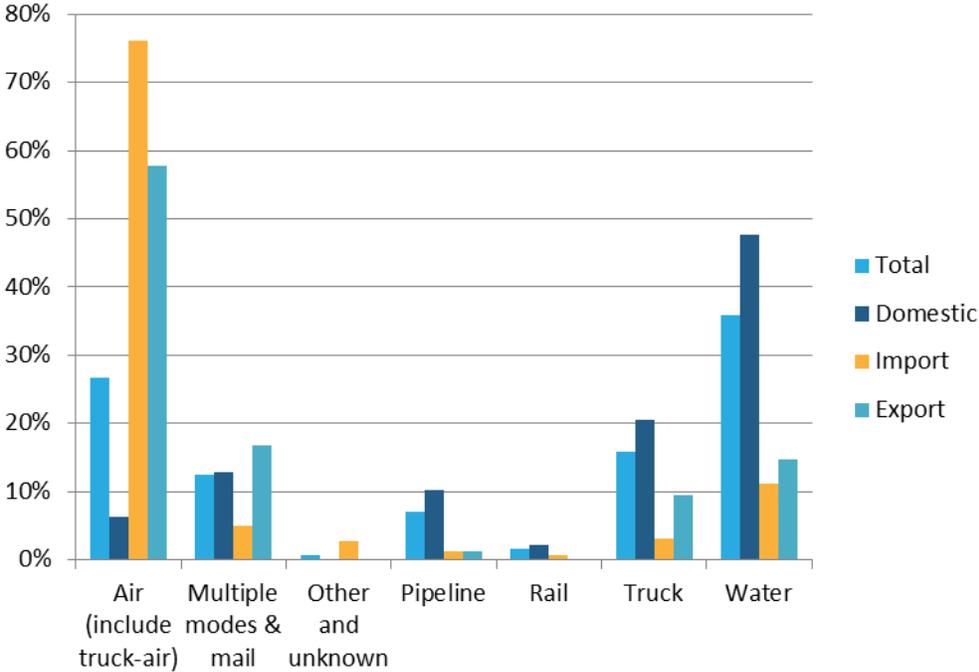


Figure A-4 - Alaska's 2015 Top 10 Exported Commodities - By Value

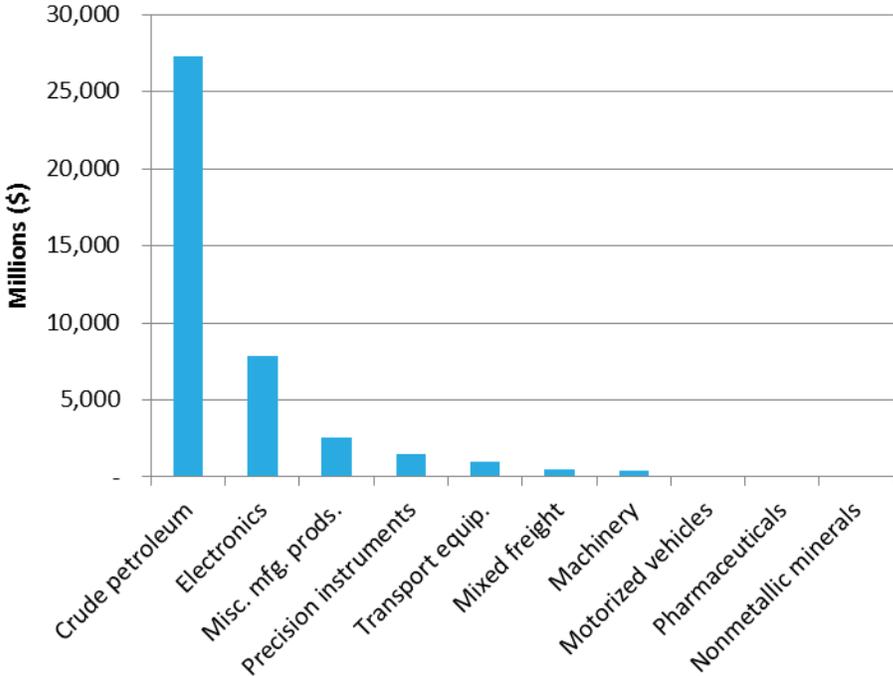
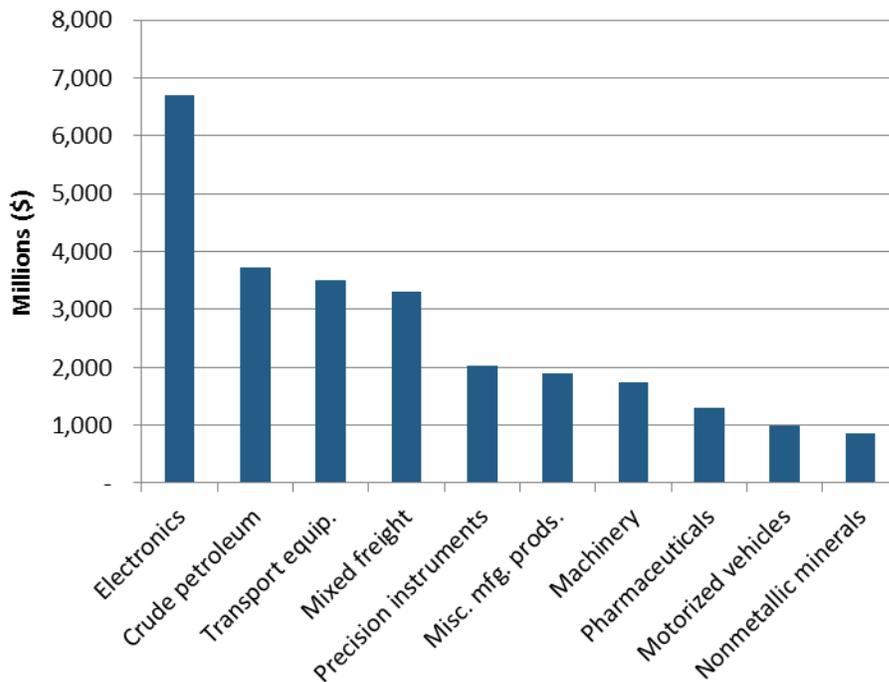




Figure A-5 - Alaska's 2015 Top 10 Imported Commodities - By Value



### 5.3 Applicability to FMP

FAF data can be used to help determine which mode is used most for transporting various commodities. The data illustrated above (Figure A-2 through Figure A-5) can be used to relay how water, air, and trucking are the most common methods of transporting goods to, from, and within Alaska and Fairbanks. Water and air transport are the most common due to the lack of roadway systems connecting the Lower 48 States to Alaska. The above figures also show how much revenue is generated from the import/export of certain goods. As can be seen in Figure A-4, the largest export for the state is crude petroleum, and the largest import to the state is electronics (Figure A-5). This information can be applied to the discussion of freight commodity flows in Fairbanks.

## 6 Alaska Railroad Corporation Annual Freight Tonnage and Revenue (2008-2014)

### 6.1 Conducted By

Alaska Railroad Corporation

### 6.2 Summary

Data was collected from ARRC on annual freight tonnage and freight revenues for 2008-2014 (Table A-5 and Table A-6). Annual Passenger data for 2008-2014 was also gathered (Table A-7).

**Table A-5 - ARRC Annual Freight Tonnage (2008-2014)**

Tons (in millions)	2008	2009	2010	2011	2012	2013	2014	Percent Change 2013-2014
<b>Bulk Petroleum</b>	1,910	1,657	1,254	1,292	1,057	947	580	-38.8%
<b>Coal (local)</b>	761	762	791	836	793	793	766	-3.4%
<b>Coal (export)</b>	471	801	1,051	836	838	793	513	-19.1%
<b>Gravel</b>	2,776	2,306	2,614	2,252	2,003	2,025	2,345	15.8%
<b>Other</b>	681	637	622	619	702	711	713	0.3%
<b>Total</b>	<b>6,599</b>	<b>6,163</b>	<b>6,332</b>	<b>6,194</b>	<b>5,561</b>	<b>5,110</b>	<b>4,917</b>	<b>-3.8%</b>

FNSB, Community Planning Department, Community Research Center, 2015a

**Table A-6 – ARRC Annual Freight Revenue Dollars (2008-2014)**

Revenue (in \$ millions)	2008	2009	2010	2011	2012	2013	2014	Percent Change 2013-2014
<b>Total</b>	\$98,914	\$87,515	\$87,019	\$98,045	\$100,021	\$96,575	\$94,249	-2.4%

FNSB, Community Planning Department, Community Research Center, 2015a

**Table A-7 - ARRC Annual Passengers (2008-2014)**

Passengers	2008	2009	2010	2011	2012	2013	2014	Percent Change 2013-2014
<b>ARRC Ridership*</b>	218,833	206,410	171,975	193,293	204,331	223,577	228,073	2.0%
<b>Cruiseline Railcars</b>	323,838	264,376	233,160	218,916	311,159	266,105	240,588	-9.6%
<b>Total:</b>	<b>542,671</b>	<b>470,789</b>	<b>405,135</b>	<b>412,209</b>	<b>415,490</b>	<b>489,682</b>	<b>468,661</b>	<b>-4.3%</b>

FNSB, Community Planning Department, Community Research Center, 2015a

### 6.3 Applicability to FMP

Rail freight revenue and tonnage provides valuable information on bulk freight levels. For example, bulk petroleum freight movement has decreased dramatically by -38 percent between 2008 and 2014, and overall freight revenue has also decreased by -2.4 percent during that period. Analyzing these trends is important in discerning the types of policies that may help increase future ARRC freight transportation.

Annual ARRC passenger data from 2008 through 2014 is important to integrate into the freight planning process because passenger rail services share rail tracks with ARRC's freight services. The total amount of passenger ridership could increase/decrease overall passenger rail activity, potentially indirectly affecting rail freight movement through issues with scheduling and hours of delivery, especially during peak tourism season.

## 7 Average Daily Traffic Volumes, 2014

### 7.1 Conducted By

State of Alaska, Department of Transportation and Public Facilities, 2014

### 7.2 Summary

DOT&PF's Average Daily Traffic Volumes and Truck Percentage by highway was analyzed for 2014 (Table A-8). This data illustrates what percentage of average daily traffic consists of truck traffic.

**Table A-8 - Average Daily Traffic Volumes and Truck Percentages by Regional and Local Highway, 2014**

Location	2014 Average Daily Traffic	Total Truck %			
		2014	2013	2012	2011
10 <sup>th</sup> Avenue, West of Steese Expressway	2,980	8%	N/A	N/A	5%
College Road at Bentley Mall	13,249	3%	3%	3%	3%
Old Steese North of Hagelbarger Road	1,355	24%	10	8	6
Farmers Loop Road West of Steese Expressway	6,625	3%	N/A	N/A	N/A
Steese Expressway North of Trainor Gate Road	22,375	8%	7%	7%	7%
Steese Expressway North of Farmers Loop Road	13,785	13%	7%	8%	N/A
Anderson Road West of Airport Road	165	23%	N/A	N/A	N/A
Airport Way West of Steese Expressway	16,183	4%	4%	4%	4%
Peger Road at Chena Bridge	14,323	7%	6%	6%	6%
Cushman Street North of Chena Bridge <sup>1</sup>	7,067	4%	N/A	N/A	3%
Phillips Field Road at railroad tracks	5,120	7%	N/A	N/A	N/A
Barnette Street North of Chena Bridge	6,960	3%	N/A	N/A	N/A



<b>Richardson Highway South of Eielson Air Force Base Access Road</b>	2,270	14%	18%	N/A	12%
<b>Richardson Highway at Moose Creek</b>	7,373	N/A	N/A	9%	9%
<b>Richardson Highway at 3 Mile</b>	24,885	N/A	N/A	N/A	8%
<b>Parks Highway West of Lathrop Street</b>	13,367	7%	7%	7%	7%
<b>Parks Highway at Chena Bridge</b>	15,445	N/A	N/A	6%	6%
<b>Johansen Expressway East of University Avenue</b>	20,104	N/A	5%	N/A	5%
<sup>1</sup> Converted to one way in 2013					

### 7.3 Applicability to FMP

This data is useful for the FMP because it helps identify which highways and routes freight trucks use. For example, the Steese Expressway north of Farmers Loop has seen an increase in freight traffic over the last two years, increasing from 8 to 13 percent between 2012 and 2014. This data can help policy makers determine many factors such as whether this freight route needs to be improved to accommodate for larger vehicles, if the route could be developed to handle more freight traffic, or if the road needs additional safety precautions in relation to the community and pedestrian facilities.

# Freight Reports and Studies

## 8 Fairbanks Metro 2040 – “A Roadmap to 2040”

### 8.1 Conducted By

Fairbanks Metropolitan Area Transportation System, 2015

### 8.2 Summary

The 2040 Update of the Fairbanks Metropolitan Transportation System (FMATS) Metropolitan Transportation Plan (MTP) was prepared as the long-term transportation master plan or framework for the Fairbanks metropolitan area. The MTP update identified existing needs and future systems for all travel modes, evaluated current land uses, created a plan, and defined project and policy priorities for the future implementation in the region.

### 8.3 Purpose and Goals

The 2040 MTP included the following goals for the transportation system in the Fairbanks metropolitan area:

- Coordinate planning efforts to provide an integrated transportation and land use system that embodies smart growth principles and stimulates economic growth;
- Provide a safe, efficient, secure, and interconnected multi-modal transportation system for all users;
- Protect the environment, improve air quality, and promote energy efficiency;
- Optimize the utility and lifespan of the existing transportation system; and
- Ensure adequate transportation facilities to support economic development.

### 8.4 Key Freight Conclusions and Findings

The 2040 MTP included a chapter regarding freight needs within the Fairbanks community and identified several roads in the local region as critical freight infrastructure, including the Mitchell Expressway, Airport Way, and the Richardson and Steese Highways. Intercity roads were also assessed, including the Dalton, Parks, and Alaska Highways. These highways link Fairbanks to Anchorage, provide access to and from the Arctic oil fields, and connect to Canada and the Lower 48 States. These intercity links are critical to freight truck movement, with truck traffic ranging from 16 to 70 percent on these highways.

ARRC operates railroad located within Fairbanks. ARRC primarily moves coal and oil field supplies as well as refined petroleum and heavy equipment. ARRC also operates passenger trains within the Fairbanks area.

The Trans-Alaska Pipeline is 800 miles long, beginning at Prudhoe Bay and carrying crude oil across the state to the terminus located in Valdez. The pipeline parallels the Dalton Highway and passes through

Fairbanks and North Pole before heading south to Valdez. Oil production has declined, thus posing several challenges to continuing the nearly 40-year-old pipeline operation.

## 8.5 Emerging Freight Issues

The Fairbanks metropolitan area's improvement needs, relating to the freight system, included reducing the number of at-grade railroad crossings and increasing freight traffic capabilities. This latter need is related to potential trucking of natural gas in the Fairbanks area. The 2040 MTP listed specific road intersections and links, as well as specific areas that need improvement. This road recommendation list was intended to serve as a guide for future freight planning, including:

### General Needs:

- Reduction of the number of at-grade railroad crossings; and
- Increasing freight traffic capabilities to handle potential increased trucking of natural gas to Fairbanks<sup>1</sup>.

### Area Issues:

- Peger Road, Davis Road, and Danby Street overhead signal mast arm clearance issues;
- Philips Field Road pedestrian and bicycle conflicts;
- Downtown area parking issues and difficulties pushing pallets in winter months;
- Many industrial and shipping companies are moving to the Van Horn Road area, increasing freight traffic; and
- Goldstream Road used as freight routes because it is preferred by truckers due to less restrictive height limitations and because of permafrost issues.

### Specific recommendations included:

- Left-turn signal time increase at the Johansen Expressway and Old Steese Highway (westbound) intersection;
- Left turn signal time increase at the South Cushman Street and 23<sup>rd</sup> Avenue intersection;
- Left turn signal time increase at the Mitchell Expressway and Peger Road (both westbound and eastbound) intersection;
- Better truck turning maneuvering space on Buzby and Laurence Roads;
- Left turn signal time increase on the Old Steese Highway and at Trainor Gate intersection; and
- Drainage and paving along 34<sup>th</sup> Street from South Cushman Street to MacArthur Street.

An emerging freight issue identified in the MTP related to oil and gas distribution via pipeline included corrosion and ice in the pipeline due to oil and wax deposit buildup. Immediate solutions to this issue included more cleaning and heading recirculated oil at the pump stations. When the MTP was prepared, a larger study to assess the long-term effects of the declining use of the pipeline was underway.

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<sup>1</sup> Since publication of the MTP, the mission at Eielson Air Force Base has been expanded. FMATS is starting an MTP update which will include increasing freight capabilities associated with the new mission.

## 8.6 Applicability to FMP

The FMP will be guided by elements presented in the 2040 MTP. Information in the MTP will also be relevant to the FMP as it lays the framework and foundation for freight in the Fairbanks area, using existing data related to freight mobility. The specific recommendations included in the freight section of the MTP can be incorporated into existing and future conditions and needs descriptions in the FMP.

# 9 Fairbanks Area Line Relocation Study (2001)

## 9.1 Conducted By

Alaska Railroad Corporation, 2001

## 9.2 Summary

The Fairbanks Area Line Relocation was a proposed ARRC project to straighten the rail alignment within the Fairbanks metropolitan area and extend the passenger services from the ARRC Depot to Moose Creek in North Pole, making more transit services available to the community. The realignment would include optimized use (more direct routes) and potentially increase the safety of rail/vehicular traffic at points where they intersect.

## 9.3 Purpose and Goals

The purpose of the Fairbanks Area Line Relocation was to:

- Enhance the safety of road /rail crossings, railroad operations, and pedestrian activities within urban/suburban Fairbanks and along the Eielson Branch;
- Reduce travel times and improve operational efficiency; and
- Accommodate mass transit and passenger service.

The objective was to:

- Construct a straighter railroad track alignment;
- Reduce at-grade road crossings; and
- Establish a rail-based passenger system within the FNSB.

Dozens of railroad crossings currently exist throughout Fairbanks and Eielson Air Force Base. Decreasing the amount of at-grade crossings would reduce roadway traffic delays and the likelihood of potential vehicle/train accidents. Having fewer crossings optimizes rail travel times; thus, the movement of freight goods could be improved with faster rates and more efficient delivery of goods.

## 9.4 Key Freight Conclusions and Findings

The railroad carries important goods and freight from Anchorage and can be utilized to a greater degree with the development of the Fairbanks Area Line Relocation project. The system would provide more passenger service, which may induce transit-oriented development to occur in areas near train stops and depots. Extending the rail line to the City of North Pole would also potentially spur economic development through better connectivity on this corridor.

## 9.5 Emerging Freight Issues

The Fairbanks Area Line Relocation project would improve the alignment of mainline and branch trains in the area. The project would improve safety by reducing the number of at grade crossings; reducing roadway delays for all users; straightening track, thus reducing the likelihood for derailments; and relocating the railroad tracks further away from four schools. Freight movement would be improved due to reduced travel times through Fairbanks as well as between Fairbanks and North Pole. The project would also reduce maintenance needs on this section of track, which would reduce maintenance costs.

## 9.6 Applicability to FMP

The Fairbanks Area Line Relocation study included relevant information regarding the benefits of utilizing rail for goods movement that can be applied to the FMP. The project would affect the supply and demand of freight in the Fairbanks region.

There has been an increase of industrial area usage in North Pole and Fairbanks. This project could change the type of goods being brought into the community. In addition, increased consumer goods brought into North Pole could create more economic opportunities. An increase in passenger services could bolster tourism during the summer months for North Pole, which is currently only accessible by car and bus.

The project could also potentially affect the transportation of Liquefied Natural Gas (LNG) for the Interior Energy Project, providing an alternative means of transporting LNG within Fairbanks, as well as between Fairbanks and the Southcentral region of the state.

# 10 3-Mile Gate Alignment Study (2007)

## 10.1 Conducted By

PDC Engineers for the Alaska Railroad Corporation, 2007

## 10.2 Summary

The 3-Mile Gate Alignment Study was conducted to identify a route that connects the South Fairbanks Realignment, North Pole Realignment, and Fort Wainwright Realignment and to remove the existing at-grade crossing just west of 3-Mile Gate.

## 10.3 Purpose and Goals

The purpose of the 3-Mile Gate Alignment Study was to identify alternative alignments that connect the realignments and remove the existing at-grade crossing.

## 10.4 Key Freight Conclusions and Findings

The study identified three alternatives:

- High Speed Railroad, Highway over Rail
- Low Speed Railroad, Highway over Rail

- High Speed Railroad, Rail over Highway

A preferred alternative was not identified in this study.

## **10.5 Emerging Freight Issues**

There is little to no information included within the plan that is related to freight movement.

## **10.6 Applicability to FMP**

The 3-Mile Gate Alignment Study identified three alternatives that could improve the efficiency and safety of the transportation system in the 3-Mile Gate area.

# **11 Fairbanks-North Pole Realignment Phase III Technical Analysis (2007)**

## **11.1 Conducted By**

Tyrck Nyman Hayes, Inc. for the Alaska Railroad Corporation, 2007

## **11.2 Summary**

This report documented information that can be used to assess the technical feasibility of realigning a portion of the ARRC's freight line in the Fairbanks area. The purpose of the realignment would be to reduce congestion resulting from traffic operations and improve traffic safety by eliminating at-grade rail crossings. Three alternatives (Parks Highway, Chena Pump, and Trainor Gate) were studied. The analysis did not recommend a preferred alternative but did determine that all three alternatives met the project goals of improving safety and reducing congestion.

## **11.3 Purpose and Goals**

The purpose of the Fairbanks-North Pole Realignment Phase III Technical Analysis was to provide information for use in assessing the technical feasibility of realigning a portion of the ARRC's freight line to eliminate many of the at-grade rail crossings in and around the Fairbanks area. This strategy was designed as a way to improve traffic safety and reduce traffic congestion resulting from rail operations.

The study's primary objective was to provide stakeholders, including the ARRC, DOT&PF, the City of Fairbanks (COF), the Fairbanks North Star Borough (FNSB), and others the data necessary to evaluate potential infrastructure modifications that may result from realignment of the ARRC rail line.

## **11.4 Key Freight Conclusions and Findings**

The analysis documented three potential realignments of the ARRC in the Fairbanks area. A preferred alternative was not identified in this study. There was little to no information included within the plan related to freight movement.

### **11.5 Emerging Freight Issues**

This study focused on rail infrastructure and there was little information that related to freight movement. The study recognized that “Local freight service in the Fairbanks area is provided by the Airport Branch serving the airport and the industrial area of South Fairbanks. Service to Fort Wainwright, Eielson Air Force Base, North Pole and the North Pole Refinery is provided by the Eielson Branch.” It also noted that approximately 45% of ARRC’s rail traffic move through the Fairbanks Terminal.

### **11.6 Applicability to FMP**

The Fairbanks-North Pole Realignment Phase III Technical Analysis identified three alternative alignments for the ARRC that could improve the efficiency and safety of the transportation system in the Fairbanks area.

## **12 North Pole Road/Rail Crossing Reduction Project Environmental Assessment (2012)**

### **12.1 Conducted By**

Alaska Railroad Corporation, 2012

### **12.2 Plan Summary**

The North Pole Road/Rail Crossing Reduction project, also known as the first phase of the larger Fairbanks Area Line Relocation project, proposed to minimize the number of railroad crossings. The Environmental Assessment (EA) prepared for this proposed project documented the analysis of potential environmental impacts and provided several alternatives in accordance with the National Environmental Policy Act (NEPA).

### **12.3 Purpose and Goals**

The purpose of the project was to “enhance public safety, reduce transportation conflict, and improve ARRC’s operating efficiency.” The project aimed to improve vehicle and pedestrian safety by reducing railroad crossings while minimizing the impact to businesses and property owners. Fewer at-grade crossings would improve safety and reduce the potential for delays in traffic, especially for emergency response vehicles. The project proposed to increase freight travel speed for efficiency purposes and reduce transportation conflicts.

### **12.4 Key Freight Conclusions and Findings**

The EA documented the evaluation of two build alternatives for the project. The project was structured to identify ways to increase transportation productivity and to better utilize the rail lines within Fairbanks by servicing more sections of Fairbanks, Fort Wainwright, and North Pole.

### **12.5 Emerging Freight Issues**

The North Pole Road/Rail Crossing Reduction project would increase connectivity between North Pole and Fairbanks. There would be an increase in rail travel efficiency, thus delivering freight goods carried

by rail to destinations at a faster rate. The realignment would also create easier access to locations like Van Horn Road, which has seen increased industrial development in recent years (Kittelsohn & Associates, Inc., 2015). The first phase of the rail reduction project would be to align the rail line through the southern portion of Fairbanks, skirting the Tanana River all the way to North Pole. The project area intends to realign the rail tracks along a section of the ARRC Eielson Branch to increase efficiency and safety by reducing the number of at-grade road/rail crossings in the City of North Pole. The project intends to move the rail system away from the concentrated city population and extends from the Richardson Highway Milepost (MP) 355 to 347.

## **12.6 Applicability to FMP**

The project could increase freight connectivity between central Fairbanks and North Pole as well as bring more business to the City of North Pole. Industrial and commercial facilities could be built in the main areas adjacent to stops created along the rail corridor. FAI, as well as a growing industrial zone south of Fairbanks, could be easily accessed by rail.

# **13 Fairbanks North Star Borough Regional Comprehensive Plan (2005)**

## **13.1 Conducted By**

Fairbanks North Star Borough, 2005

## **13.2 Plan Summary**

This plan provided the basic framework and vision for the FNSB regarding land use and development in the region. The plan included clearly defined goals with incremental strategies for reaching milestones specific to transportation, economic development, land uses, and community development.

## **13.3 Purpose and Goals**

The plan included goals specific to transportation needs and demand:

- To provide a safe, efficient, multi-modal transportation system that anticipates community growth:
  - Encourage location, design, and maintenance of roads based on their function and community needs;
  - Support multi-modal transportation linkages;
  - Make the FNSB more pedestrian-friendly in urban and suburban areas and safe in rural and remote areas; and
  - Support and maintain coordination with the ARRC.
- To provide sufficient public utilities and infrastructure to meet existing and future demands:
  - Develop appropriate infrastructure that supports all land use categories;
  - Encourage the expansion of utility services to accommodate existing and future development;
  - Encourage energy-efficient utility patterns; and

- Encourage safe and full utilization of available public utilities (e.g., public water and sewer services).

### **13.4 Key Freight Conclusions and Findings**

FNSB's clearly defined guidelines and goals for transportation-oriented projects could help define goals in the FMP. The plan was prepared to integrate existing services and industries with emerging technologies and strengthen the FNSB's role as the commercial and transportation hub for Interior Alaska. The comprehensive plan map identifies areas that are industrial in nature or that may be rezoned to industrial in the future. Changes to land use and zoning in the FNSB are expected to be consistent with the comprehensive plan map.

### **13.5 Emerging Freight Issues**

The FNSB has many challenges for maintaining and expanding utilities in the area. Significant issues include building in extreme winter temperatures and permafrost, which makes construction of water and sewer lines costly and difficult. Adequate infrastructure is necessary for accommodating future development and freight transportation that comes with growth. Encouraging development of industrial infrastructure, consolidating road service areas, and encouraging adequate transportation services to serve business activities are strategies FNSB would like to utilize to meet the region's larger goals. Transportation routes (e.g., rail and trucks) and storage areas for hazardous materials would be routed away from residential and other intensive human-use areas.

### **13.6 Applicability to FMP**

The goals and strategies identified in the plan regarding efficient multi-modal transportation systems and sufficient public utilities and infrastructure to meet existing and future demands of the region will be used to support the policies included in the FMP. The plan map also identifies areas that may be suitable for industrial development.

## **14 Statewide Hazardous Materials Commodity Flow Study (2010)**

### **14.1 Prepared By**

Alaska Department of Environmental Conservation and Alaska Department of Military and Veterans Affairs, 2010

### **14.2 Plan Summary**

The purpose of this study was to compile data on transporting extremely hazardous substances (EHS), hazardous substances (HS), and oil/petroleum products in communities throughout the State of Alaska. The study found that sodium cyanide, chlorine, and sulfuric acid are some of the top EHS commodities affecting Alaska (based on volume of these commodities moved). The study divides the state into several groups. Interior Alaska is a grouping that includes Fairbanks and other smaller surrounding communities in the Interior region. This region experienced the second highest amount of transported

EHS in the state due to its close proximity to the railroad network and the pipeline as well as its connectivity with Southcentral Alaska.

### **14.3 Purpose and Goals**

The study was prepared to provide greater data accuracy for agencies to define EHS movements; identify shipping locations, including the transportation modes of the shipments; and document the shipment process of hazardous materials. Understanding the transportation of EHS can help policy makers and stakeholders better identify strategies and recommendations to relocate these systems and facilities to areas more suitable for EHS and HS as well as determine which routes are the safest for transporting these goods. The study could also be used to share information as part of the FMP and potentially guide FMP policies related to hazardous material movement.

### **14.4 Key Freight Conclusions and Findings**

Over 28 trillion pounds of hazardous materials were transported via air, highway, rail, marine, and pipeline within the State of Alaska during the study's 3-year period. Pipeline and rail modes comprise a large proportion of transporting hazardous material, specifically commodities such as petroleum crude oil in Interior Alaska and the Fairbanks area. The Alaska Highway, Dalton Highway, Elliot Highway, , and Richardson Highway are the corridors primarily used to transport these types of materials from Fairbanks to Valdez, Anchorage, and the North Slope.

### **14.5 Emerging Freight Issues**

Hazardous material is currently transported regularly by pipe, truck, and rail in the Fairbanks region. Although most movements occur by truck on the highway system, hazardous material must bypass local roadways and connectors that provide access to Fairbanks. Similarly, when hazardous material is transported into the area by rail, it must be transferred to truck, and then trucked between the rail yard and the distribution centers using the local roadway network. Safety related to these types of intermodal transfers and connections to other modes of hazardous materials on local streets is an important policy consideration. This is an emerging issue in Fairbanks, with potentially more hazardous materials such as LNG being transported in the general traffic. Safety of other drivers as well as those transporting these materials should be considered carefully.

### **14.6 Applicability to FMP**

Hazardous material shipping pattern and movement information as well as resulting transportation system design considerations to accommodate these movements that are identified in this study may be helpful in making important policy decisions related to other plans (e.g., the Fairbanks Area Line Relocation study) and the increased use of rail for passenger and goods movement in Interior Alaska. Proposed efforts like the LNG project would result in increased hazardous materials passing nearby or through the Fairbanks transportation system. The FMP should address these emerging freight issues.

## **15 North Pole Land Use Plan (2010)**

### **15.1 Prepared By**

Fairbanks North Star Borough, 2010

### **15.2 Plan Summary**

The North Pole Land Use Plan, which is specific to North Pole's needs and goals as a community, was prepared through a separate community process and adopted as a component of the FNSB Regional Comprehensive Plan (2005; see Section 11).

### **15.3 Purpose and Goals**

The main purpose of the plan was to provide a framework for identifying North Pole land use and development growth opportunities into the future. Many of the plan's goals were defined to address transportation, and in particular freight, including:

- Improve and maintain traffic circulation and parking;
- Create opportunities for new businesses, industries, and redevelopment;
- Promote local retail trade and businesses; and
- Expand and maintain public utilities.

### **15.4 Key Freight Conclusions and Findings**

The North Pole Land Use Plan supported the development of the ARRC Rail Line Extension project by recommending a 200-foot corridor along the Tanana River levee for rail line relocation through North Pole.

### **15.5 Emerging Freight Issues**

If there are more opportunities for new businesses and industries in the region, there may be more demand for goods moved into and out of the area. The ARRC's Rail Line Extension project would provide more opportunity for businesses to (re)locate in Fairbanks and take advantage of the increase in transportation connectivity between Fairbanks and North Pole.

### **15.6 Applicability to FMP**

North Pole is within the FMP project area. Although industrial and freight activity may not be at the same level as Fairbanks, there is future potential in using North Pole freight reserves. North Pole's updated land use goals could be used to support the development of potential regional land use/freight policy initiative as part of the FMP.

## **16 City of North Pole Comprehensive Strategic Plan (2016)**

### **16.1 Prepared By**

City of North Pole, 2016

## **16.2 Plan Summary**

The 2016 North Pole Comprehensive Strategic Plan outlines the vision, goals, and values of the community and provides a framework which can guide future decisions on land use, economic development, and other policies relevant to the city of North Pole.

## **16.3 Purpose and Goals**

The purpose of the plan is to serve as a guideline for the community and for policy-makers to ensure that these goals are in alignment with the community's needs and desires. The plan intends to complement the FNSB Regional Comprehensive Plan and the North Pole Land Use Plan. Some of the goals North Pole has in the plan related to freight include the following under the different groupings:

### **Economic Development:**

Goal A: Grow and support existing businesses and organizations and attract new business

### **Parks, Recreation, and Transportation:**

Goal B: Promote a connected transportation system in North Pole

Goal C: Improve traffic circulation and safety in North Pole

## **16.4 Key Freight Conclusions and Findings**

There is little to no information included within the plan that is related to freight movement.

## **16.5 Emerging Freight Issues**

The plan states to increase traffic movement in the North Pole area but did not state specific locations that require improvement or additional help.

## **16.6 Applicability to FMP**

With the City of North Pole aiming to increase economic development within their city, this could mean increased commercial and freight movement in the area. The city is also supportive of the Interior Gas Utility project's efforts to bring in natural gas to the community, which can impact the amount of natural gas being freighted to North Pole over the long-term.

# **17 Fairbanks International Airport Master Plan (2014)**

## **17.1 Prepared For**

Alaska Department of Transportation and Public Facilities, 2014

## **17.2 Plan Summary**

The 2014 FAI Master Plan Update was a comprehensive study summarizing the near-, mid-, and long-term development plans FAI should undergo to meet the future aviation demand for the region.

## **17.3 Purpose and Goals**

The goal of the 2014 Master Plan Update considered addressing three action items:

- 1) The need for increased safety and security;
- 2) Implications of increased air cargo and passenger travel demand; and
- 3) Analysis of a scenario that shifted 50 percent of cargo operations.

The 50 percent cargo shift scenario was based on an Alaska International Airport System (AIAS) strategy to increase the utilization of FAI as a refueling stop for international cargo flights.

## **17.4 Key Freight Conclusions and Findings**

Analysis prepared in support of this Master Plan (see Chapter 6 of the Master Plan Update; PDC Engineers, Inc., 2014) recommended several key facility improvements for FAI, including solutions to manage the potential shift of increasing cargo international thoroughfare to FAI. FAI would need to comply with Aircraft Design Group (ADG) V requirements as well as construct an expanded cargo apron and additional deicing facilities.

## **17.5 Emerging Issues**

The FAI Master Plan Update was largely based on information from the 2013 AIAS Planning Study, which explored the possibility of shifting 50 percent of all cargo traffic from Anchorage to Fairbanks to prevent future delays from occurring at the Ted Stevens Anchorage International Airport. The planning study evaluated FAI facilities based on its handling of ADG V and VI aircraft. The study stated that the outlook for operating larger aircraft at FAI is small without major airport reconstruction. FAI needs to implement a 500-foot separation to increase space. FAI would also need to increase its fuel storage capacity if more international cargo activity is shifted to this airport. If FAI intends to construct the 500-foot separation, cargo carriers would still need to decide whether shifting thoroughfare stops to Fairbanks would be more cost-effective and time-efficient than keeping these flights to/from Anchorage.

## **17.6 Applicability to FMP**

More cargo coming through Fairbanks would mean more utilization of the industrial reserves in the city due to an increase in cargo tonnage. There would be a stronger travel linkage between FAI and reserve sites such as those located off of Van Horn Road and the Mitchell Expressway. If the market for cargo movement expands in Fairbanks, more commercial development could occur in the city as well. The conclusions and goals in the FAI Master Plan Update will be used to support the policies included in the FMP.

# **18 Analysis of Alaska Transportation Sectors to Assess Energy Use and Impacts of Price Shocks and Climate Change Legislation (2013)**

## **18.1 Prepared By**

Institute of Social and Economic Research, University of Alaska Anchorage, 2013

## 18.2 Plan Summary

This study presented an analysis of energy consumption by Alaska's transportation sectors to assess the impacts of sudden oil price changes or the potential use of carbon emission taxes. The study included three types of analysis:

- 1) Estimation of energy and fuel used by air, water, truck, and rail transportation sectors as well as comparison of this fuel intensity through the estimation of passenger-miles per gallon of fuel and many other factors;
- 2) Economic input-output analysis to estimate employment and output of air, rail, truck, and water transportation sectors in the Alaska economy; and
- 3) Adjustment of input-output economic modeling assumptions to reflect sudden fuel price changes and/or emissions taxes (that function similar to an increase in fuel prices) to estimate the potential impact of these changes on future industry outputs, employment, and households in Alaska.

## 18.3 Purpose and Goals

The study created a better understanding of how energy prices and legislation affect transportation patterns and efficiency. Alaska's energy consumption is triple that of the national average, which means high energy use particularly affects Alaska if energy prices fluctuate and/or change rapidly.

## 18.4 Key Freight Conclusions and Findings

The study's findings indicated that Alaska's major industries—petroleum refining, natural gas distribution, and state and local government—are most vulnerable to fuel price shocks. For example, ARRC's services could become more competitive with trucking if railroad transportation of freight becomes increasingly efficient. In Fairbanks, cost for energy and heating supply are high, so discussion of potential alternatives is included as a discussion in the FMP development process.

## 18.5 Emerging Freight Issues

In recent years, petroleum products moved by freight trains from the North Pole refinery to the Anchorage area comprised most of ARRC's freight revenue. The railroad could potentially carry these volumes more efficiently and at a lower cost than trucks. The Fairbanks Area Line Relocation project could increase goods movements in the Fairbanks region as well as other regions in Alaska.

## 18.6 Applicability to FMP

Freight data compiled and used as well as the transportation system and mode analysis conducted to support this study could be relevant and applied to the FMP.

## **19 Fairbanks North Star Borough 2012 Gas Distribution System Analysis (2012)**

### **19.1 Prepared By**

Northern Economics, 2012

### **19.2 Plan Summary**

This analysis was prepared to determine how much savings would be found in alternative scenarios that used natural gas and propane for energy sources in the FNSB area. The study included several analyses including, Strengths, Weaknesses, Opportunities, and Threats (SWOT), cost-benefit, air quality, and long-term consumer savings. According to this study, the propane- and gas-based distribution system in Fairbanks would reduce fuel costs and save the community \$315 million annually, a 60 percent savings compared to the current cost of using fuel oil and wood (Northern Economics, 2012).

### **19.3 Purpose and Goals**

There were two goals generated in this analysis:

- 1) To define an optimized plan for the rapid build-out of the FNSB's energy distribution infrastructure, one that delivers affordable propane and/or natural gas to the largest number of FNSB residents, businesses, and their properties; and
- 2) To assess the impact of the proposed infrastructure build-out on air quality in the FNSB nonattainment area.

### **19.4 Key Freight Conclusions and Findings**

The cost-benefit analysis in this study concluded that the gains far outweigh costs in all three population density areas evaluated (low, medium, high), and pursuing a gas distribution project would be cost-effective for the FNSB. The conversion of natural gas/propane was determined to be more affordable for residents and businesses than existing fuel sources.

### **19.5 Emerging Freight Issues**

Feeder gas distribution lines would provide service to Fairbanks and the surrounding areas running along major roads, including Chena Ridge Loop Road, Chena Ridge Road, Sheep Creek Road, Farmers Loop Road, Chena Hot Springs Road, Nordale Road, and Badger Road. If implemented to support this plan, new pipelines and utility easements would be constructed to follow existing roadway right-of-ways, which would affect future development of roads to accommodate larger trucks to move freight.

### **19.6 Applicability to FMP**

The FMP analysis will consider the findings and conclusions of this plan to support the development of plans and policies.

## **20 Interior Energy Project – Feasibility Report (2013)**

### **20.1 Prepared By**

Alaska Industrial Development and Export Authority, 2013

### **20.2 Plan Summary**

The Interior Energy Project (IEP) is a joint project between AIDEA and a number of other state government agencies whose goal is to bring natural gas sources to Interior Alaska by way of water, truck, train, or pipe. This feasibility report was based on the economic and financial analysis conducted for the IEP. The study's conclusions concluded that the proposed LNG plant will be a feasible project with competitive natural gas costs for the Fairbanks community. The study included surveys of plant development/construction schedules, potential risks, and risk mitigation strategies regarding the project's feasibility.

### **20.3 Purpose and Goals**

The purpose of the study was to illustrate the commercial and financial feasibility of the LNG project.

### **20.4 Key Freight Conclusions and Findings**

The study concluded that the IEP is technically and financially feasible. Specific information about transportation system usage and the potential change in freight travel patterns generated by the project were not documented in the study. However, the study did anticipate that an existing or future trucking company would serve this project. In addition, more LNG used in the FNSB would increase local LNG-oriented freight activity. Increased intermodal security and safety will need to be considered as more LNG travels on the local freight network to reach its respective distribution centers.

### **20.5 Emerging Freight Issues**

AIDEA did not investigate storage, regasification, or distribution costs as part of its analysis; however, movement of LNG would certainly play a large role in local freight mobility and transportation system usage. The proposed project would include trucking natural gas from Deadhorse to Fairbanks, primarily using the northern routes—the Steese and Dalton Highways. The Richardson and Steese Highways, located in the urbanized area, have been identified as key freight routes for trucks moving LNG, which include key bottleneck areas and at-grade crossing locations, which were identified in the Richardson Highway/Steese Expressway Corridor Planning & Environmental Linkages Study (DOT&PF, 2015).

### **20.6 Applicability to FMP**

The potential for the LNG project should be considered in the plans and policies to be identified in the FMP. The LNG project would bring economic changes to Fairbanks, affecting the way transportation and trading of goods will be defined.

## **21 Interior Energy Project Economic Impact Analysis (2014)**

### **21.1 Prepared For**

Alaska Industrial Development and Export Authority, 2014

### **21.2 Plan Summary**

The IEP Economic Impact Analysis provided a review of regional economic implications associated with LNG project natural gas expansion in the FNSB. This analysis included FNSB businesses and industries, wages of resident employees, and spending on local goods and services. The economic impact analysis used the IMPLAN economic model for the inputs-outputs and considered the direct, indirect, and induced economic effects of the LNG project on Fairbanks.

### **21.3 Purpose and Goals**

The purpose and goals of the study included analysis of the following components:

- Annual labor and material expenditures anticipated for project construction;
- Annual expenditures for natural gas within the project area;
- The number of homes and businesses to be converted to natural gas and the cost of doing so;
- The decrease in heating oil consumption resulting from households and businesses converting to natural gas;
- The cost of trucking adequate quantities of LNG from the North Slope to meet natural gas demand in the study area; and
- The savings obtained by households and businesses as well as the resulting increase in disposable income for those that convert to natural gas.

The study concluded that FNSB businesses that converted from heating oil to natural gas would save significant money, upwards of 50 percent. At the time of the study, there were two refineries located in the FNSB: the Petro Star North Pole refinery and Flint Hills Resources North Pole refinery (now closed). The economic report also analyzed heating oil distributors and concluded that the project would impact the ten FNSB main heating oil distributors in the region.

### **21.4 Key Freight Conclusions and Findings**

The Economic Impact Analysis illustrated the different economic sectors that could be impacted by the growth of LNG in the Fairbanks area. The analysis looked specifically at total trucking employment and income impacts, stating that the project would support an average of 110 additional jobs annually (50 indirect and 60 induced) in Fairbanks. The study stated that during each year during the 2014 to 2028 period, the LNG project would support 520 local jobs and \$14.2 million in income on average. Of these, the LNG project would indirectly support approximately 480 jobs and \$9.2 million in income at other FNSB businesses.

## **21.5 Emerging Freight Issues**

The increase of LNG freight movement would potentially lower household and business costs for energy and heating in the Interior region. With less spending on lowered energy costs, households and businesses would have more spending capital to feed back into the economy by purchasing more local goods, thus contributing to increased freight activity.

## **21.6 Applicability to FMP**

The potential for the LNG project will be considered in the projections and policies laid out in the FMP.

# **22 Interior Energy Project -Alaska State Legislature Quarterly Report (2016)**

## **22.1 Prepared By**

Joint Project, Alaska Industrial Development and Export Authority, 2016

## **22.2 Plan Summary**

IEP work was divided into several project components: supply, liquefaction (alternative supply), transportation, distribution (including storage), and conversion. The status of these sections of the project was updated in the quarterly report to the Alaska State Legislature (AIDEA, 2016). This quarterly report provided the latest information on the LNG project. AIDEA is currently evaluating proposals from a series of private companies seeking to win the bid for hauling LNG from Point MacKenzie or the North Slope, where there is currently no liquefaction plant.

## **22.3 Purpose and Goals**

The IEP was designed to bring low cost energy and natural gas to residents and businesses in Interior Alaska. This was the second report drafted under the guidance of HB105, which formed the IEP, a joint project between AIDEA; AEA; Alaska Department of Commerce, Community, and Economic Development; Alaska Department of Revenue; and Alaska Department of Natural Resources.

## **22.4 Key Freight Conclusions and Findings**

The success of the LNG delivery project will be dependent on connecting customers to the energy source. The IEP provides status updates concerning the transportation and distribution of LNG. There were two options being considered for transporting LNG—rail and trucking.

ARRC received a letter from the Federal Railroad Administration (FRA) in November 2015 to allow increased transport of LNG to match the needs of the IEP. If larger quantities of LNG can be moved, it could potentially lower the cost of transportation for the IEP.

AIDEA, with Fairbanks Natural Gas (FNG), has also been participating in a pilot test of a large capacity LNG trailer. The pilot test will occur on the Parks and Dalton Highways, with tests on weight limits, maximum capacity, safety, and overall performance of the trailer. If a large capacity trailer meets the desired performance goals, then it may also be an opportunity for LNG to be transported via truck.

In 2015, FNG installed more than 60 miles of new distribution pipe throughout the core of Fairbanks. Interior Gas Utility also installed an additional 73 miles of pipe in North Pole in preparation for more LNG coming through Interior Alaska to help soaring energy costs.

## **22.5 Emerging Freight Issues**

Getting natural gas to the Fairbanks area has been of particular interest to AIDEA, and the future distribution of LNG in Interior Alaska could mitigate Fairbanks' high energy costs. Fairbanks is largely dependent on fuel oil and wood for heating, so many residents would need to convert their heating systems to natural gas. Getting LNG freight to Fairbanks will be the prime concern. Either LNG would be trucked from the North Slope, or transportation of Cook Inlet's LNG to Fairbanks would be expanded. Both cases would require trucking trailers to be bigger and safer while accessing Fairbanks and LNG project staging grounds. Fairbanks would need to know where these distribution centers would be and how LNG would be accessed by interested local operators and competitors such as FNG, Golden Valley Energy Association, and Interior Gas Utility. Interior Gas Utility, operated by the FNSB, has been installing a local gas pipeline system that will be ready when LNG deliveries begin.

## **22.6 Applicability to FMP**

With the state's assistance for the IEP, AIDEA believes LNG will be more affordable than oil-based fuels in Fairbanks. Having appropriate access for LNG freighting and distribution will be considered in the policies defined to support the FMP.

# **23 Richardson Highway/Steese Expressway Corridor Planning Environmental Linkages Study Report (2015)**

## **23.1 Prepared by**

Alaska Department of Transportation and Public Facilities, 2015

## **23.2 Plan Summary**

The Richardson and Steese Highways are two major transportation corridors in Interior Alaska that connect to the urban core of the FNSB. This Planning Environmental Linkages (PEL) study identified traffic and safety problems, potential improvements, and three alternative concepts for the Richardson Highway/Steese Expressway within the FNSB urbanized area. The study covered the Steese Highway Milepost 4.9 to the Richardson Highway Milepost 357. The study compared three different concepts for addressing traffic problems and potential improvements within the study area. The findings of the study will be used to make preliminary determinations regarding what type of NEPA documentation will be necessary for future projects.

## **23.3 Purpose and Goals**

The purpose of this PEL study was to:

- Identify cost-effective, corridor-wide improvements to address existing and projected traffic congestion and safety issues;
- Conduct a preliminary assessment of environmental effects from proposed improvements;
- Involve the public and agencies throughout the planning process;
- Document the planning process and decisions to support future project-level environmental reviews; and
- Streamline implementation of recommended improvements.

In relation to freight, the proposed project was designed to improve freight movement in the corridor by reducing congestion, minimizing the number and impact of at-grade railroad crossings, and reducing vertical clearance obstructions.

### **23.4 Key Freight Conclusions and Findings**

The Steese and Richardson Highways are key freight routes that connect Fairbanks to the North Slope oil fields as well as other communities around Interior Alaska. Goods moved from Canada or the Lower 48 States also reach Fairbanks via the Richardson Highway. Freight and oversized load movements are currently inefficient in the study area because large loads have to go around structures such as traffic signal arms, which delays traffic in the area.

Of the three concepts proposed to stakeholders, Concept 1 was determined to best meet the purpose and need of the project. Concept 1 provided the greatest benefits for safety, mobility, and freight movement. In addition, Concept 1 would replace traffic signal masts to allow taller trucks to pass. Concept 1 included constructing grade-separated crossings to eliminate the need for large trucks to stop at railroad tracks.

### **23.5 Emerging Freight Issues**

The Richardson and Steese Highways within the Fairbanks urbanized area have a number of problems, including high-volume of cross streets and higher motorized and non-motorized traffic volumes. There are seven signalized lights and three interchanges within the project area. These could pose future problems for freight movement efficiency through longer delays and stops on these major corridors.

### **23.6 Applicability to FMP**

The PEL study contained detailed technical information as well as identified key issues that currently exist and could inhibit future freight transportation efficiency in the study area. These issues could support the policy goals that will be included in the FMP.

## **24 Alaska State Rail Plan Update (2016) - DRAFT**

### **24.1 Prepared For**

Alaska Department of Transportation and Public Facilities (2016)

## 24.2 Plan Summary

DOT&PF has developed the Alaska State Rail Plan (ASRP) to formulate a vision for rail in Alaska as well as guide the state's rail freight and passenger transportation planning activities and project development plans over the next 20 years.

Alaska's rail system plays an essential role in transporting goods to and from Alaska. Much of the food, consumer goods, and special/oversized equipment is shipped to Alaska on container/trailer ship and transported to destinations (ultimately Fairbanks) 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. Both of Alaska's railroads (ARRC and White Pass & Yukon Route [WP&YR]) provide passenger service, which provides a needed transportation service to the state's residents and supports the state's tourism industry.

The ASRP described the state's existing rail network and rail-related economic and socio-economic impacts. It also described the state rail plan process, Alaska's rail vision and supporting goals, potential capital improvements, studies, and recommended next steps.

The ASRP was intended to meet the requirements established by the Federal Passenger Rail Investment and Improvement Act of 2008 to qualify for future federal funding for rail projects.

## 24.3 Purpose and Goals

The purpose of this comprehensive ASRP is to establish a vision for Alaska's passenger and freight rail system. That vision should be grounded in what the users of the rail system—the rail shippers, the passengers, the communities served, the state as a whole—and the railroads need for their rail service. This plan included an articulation of a vision for the Alaska rail system, a description of the process that developed that vision, and a program of improvements over time needed to implement that vision. This also is a plan to guide the State of Alaska and DOT&PF's role in future rail transportation in Alaska; it is not a long-term plan for ARRC or WP&YR.

The goals identified in the ASRP were:

- Goal 1: Promote Economic Development in Alaska;
- Goal 2: Enhance Safety;
- Goal 3: Encourage Partnership and Collaboration;
- Goal 4: Support Improvements to System Preservation, Efficiency, and Capacity;
- Goal 5: Improve Connectivity of the Transportation System;
- Goal 6: Enhance Quality of Life and Environmental Sustainability;
- Goal 7: Address Community Issues that Arise from Urban Development around Railroads; and
- Goal 8: Establish a Recurring Public Capital Investment Program.

## 24.4 Key Freight Conclusions and Findings

Key findings that emerged from ASRP included:

- Maintenance of a strong and fully functional ARRC and WP&YR will be important to the future economy of the State of Alaska.

- Alaska needs its existing railroads if it is to realize the economic development goals it has as a state and as a society. In fact, some of these state goals 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 in the best long-term interest 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.

## 24.5 Emerging Freight Issues

The amount of goods shipped by rail to/from Fairbanks was negatively impacted by the closure of the Flint Hills refinery. There may be potential for rail shipments to increase if any of the potential resource development projects such as an LNG pipeline are developed. The ARRC now has FRA approval to ship LNG by rail, which may provide additional opportunity for LNG use in the FMATS area.

## 24.6 Applicability to FMP

The ASRP identified several projects that, when implemented, will benefit freight movements in the FMATS area. Those projects included:

- Fairbanks Area Rail Plan.<sup>2</sup>
- ARRC Fairbanks Area Line Relocation - Phase 1;
- ARRC Northern Rail Extension;
- ARRC Fairbanks Airport Branch and Eielson Branch Staging Areas;
- ARRC Fairbanks Freight Intermodal Terminal Rail/Truck Staging Area;
- Grade separation of All NHS At-grade Rail Crossings;
- Grade Separation of Significant Non-NHS At-grade Crossings;
- Extending Transportation Facilities to Provide Surface Access to Resource Development Opportunities; and

These projects and associated policies will be considered for incorporation into the FMP.

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<sup>2</sup> FMATS and the FNSB believe this project should be the highest priority because it had the highest benefit/cost score in the ASRP. They believe the plan should be a road/rail crossing reduction multi-modal plan.

## **25 Alaska Long-Range Transportation Plan Update, Freight Element (2016) - DRAFT**

### **25.1 Prepared By**

Alaska Department of Transportation and Public Facilities, 2016

### **25.2 Plan Summary**

The Alaska Statewide Freight Plan was developed concurrently with the Alaska Long-Range Transportation Plan (LRTP) and is considered a stand-alone document to that plan. The outcomes of the State Freight Plan were integrated as the freight element of the LRTP. It comprehensively addressed Alaska's major freight transportation modes—truck, air, water, rail, and pipeline. Special attention was paid to the critical role that Alaska's freight transportation system plays in the state's economy.

The Freight Plan:

- Identified and supported strategies, policies, and actions designed to achieve Alaska's economic development and transportation goals; and
- Addressed federal guidance (established in MAP-21 legislation) for preparation of Statewide Freight Plans.

### **25.3 Purpose and Goals**

Goals identified in the plan included:

- Develop new capacity and connections that cost-effectively address transportation system performance targets, and make the existing transportation system better and safer by improving productivity and reliability as well as reducing safety risks;
- Manage and operate the system to improve operational efficiency and safety;
- Promote and support economic development by ensuring safe, efficient, and reliable access to local, national, and international markets for Alaska's people, goods, and resources as well as for federal freight-related activity critical to the state's economy;
- Improve transportation system safety and security;
- Incorporate livability considerations, community, and environmental considerations in planning, delivering, operating, and maintaining the Alaska's transportation system; and
- Ensure broad understanding of the level, source, and use of transportation funds availability to DOT&PF as well as provide and communicate the linkages between the statewide LRTP, area plans, asset management, other plans, project investment decisions, and transportation system performance.

### **25.4 Key Freight Conclusions and Findings**

The Freight Plan was based on a detailed review of domestic and international commodity flows, economic data, an assessment of Alaska's freight facility performance, recent freight plans (area and modal), and other information. Stakeholders representing owners, operators, freight service providers,

and users of freight facilities were engaged throughout the process, and the public was invited to provide feedback.

The Freight Plan was also based on a systematic data-driven evaluation of the demand for freight transportation and how well it is currently met. The primary conclusions regarding planning for freight in Alaska from this analysis included:

- Freight movement in Alaska results from specific demand drivers, primarily requirements to: export natural resources from the state to national and international markets, import consumer goods and industrial supplies from other states and countries, and distribute goods within Alaska over very long supply chains.
- Freight demand in Alaska is served by multiple transportation modes—road, air, water, rail, and pipeline. Each has a critical role in the state’s multi-modal system and must be considered in the context of the entire system.
- Alaska’s freight demand drivers are impacted by critical trends. This plan was based on the high likelihood that the primary trends experienced in recent years that affect freight will continue. These trends included: a growing population that is increasingly concentrated in urban areas, rising overall industrial production but high uncertainty regarding future energy production, and increasing seasonal/annual variability in demand due to climate change and other factors. Critical trends, acting on and over Alaska’s freight transportation network, have led to changes in system performance and created both needs and opportunities.
- To provide acceptable freight system performance—defined as available, reliable, affordable, timely, safe, and secure—the freight plan addressed the following needs and opportunities: bringing more resources efficiently to markets, improving truck access to intermodal facilities (e.g., ports, airports, etc.), enhancing freight mobility in growing urbanized areas and key corridors, maintaining and enhancing critical trade gateway facilities, maintaining and enhancing critical connections with Alaska’s rural communities, and doing so with constrained public funds.
- The LRTP includes goals, policies, and actions for the freight transportation system. These were aligned with the Freight Plan’s outcomes, plans, and projects based on performance-based resource allocation; were managed within the system to increase performance and reduce risk; and provided accountability for the expenditure of public funds.
- The Freight Plan also aligns with LRTP goals for performance-based resource allocation by creating first-generation approaches for: freight system performance measurement, freight project prioritization and evaluation, and multi-modal freight investment at a program level.
- The Freight Plan will be a valuable resource for modal plan development and area/ local freight planning for regions such as Fairbanks, and will comply with federal guidance for state freight plans.

## **25.5 Emerging Freight Issues and Applicability to FMP**

Emerging issues identified in the Freight Plan that will impact statewide freight movement include:

- Population growth and associated increases in consumption;

- Overall growth of freight intensive industries;
- Changes in resource development industries; and
- Increased seasonal variations.

The Freight Plan includes a state-level forecast of commodity and modal trends as well as modal network and facility trends.

## **25.6 Applicability to FMP**

The Freight Plan identified the major freight facilities in the state and trends affecting freight movement; needs and opportunities; and freight policies, actions, and performance measures. The plan included 40 specific freight actions designed to implement and advance its strategies and policies, which will be assessed and determined for applicability in the FMS.

## **26 Alaska Aviation System Plan (2008)**

### **26.1 Prepared By**

Alaska Department of Transportation and Public Facilities, 2008

### **26.2 Plan Summary**

The Alaska Aviation System Plan was a multi-year planning study conducted by the State of Alaska with guidance and funding support of the Federal Aviation Administration. The plan examined the existing conditions of the 255 DOT&PF-owned and operated airports across the state; identified a list of comprehensive issues compiled through stakeholder surveys and meetings; and provided guidance, information, and resources for the state's aviation system into the future.

### **26.3 Purpose and Goals**

The basic goals of the Alaska Aviation System Plan included:

- Safety - develop, operate, and maintain an airport system that contributes to aviation safety;
- Service - develop, operate, and maintain a reliable aviation system with facilities scaled to meet system user needs;
- Fiscal Responsibility - develop, operate, and maintain airport facilities and services in a cost-effective and sustainable way;
- Communication - provide opportunities for public involvement to ensure effective communication regarding aviation system needs; user needs; and airport developments, maintenance, and operations; and
- Management - effectively implement system plan policies and guidance for management, planning, design, maintenance, and operation of aviation facilities.

### **26.4 Key Freight Conclusions and Findings**

Alaskans ship 39 times more air freight than other states, and there is a heavy dependency on aviation in communities throughout the state. The plan's extensive inventory of the aviation system in Alaska

could help determine general strategies needed to increase efficient cargo thoroughfare at FAI and support other, smaller air transportation facilities in Interior Alaska.

### **26.5 Emerging Freight Issues and Applicability to FMP**

The findings and goals of the plan can be used to support the policies identified in the FMP. FAI is a major thoroughfare for freight movement. Issues related to this movement can be applied to FMP.

### **26.6 Applicability to FMP**

The plan identifies key strengths, weaknesses, and opportunities of growth related to cargo and passenger movement at FAI and the aviation system in the state. These policies can be included, if applicable, in the FMP.

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