March 10, 2016

Fairbanks North Star Borough Comprehensive Economic Development Strategy

Prepared by:

Applied Development Economics, Inc.
255 Ygnacio Valley Road, #200, Walnut Creek, CA 94596 ■ 925.934.8712
99 Pacific Street, #200 J, Monterey, CA 93940 ■ 831.324.4896
www.adeusa.com

BAY AREA GREEN BUSINESS

APPLIED DEVELOPMENT ECONOMICS

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

Economic Assessment 1

Goals and Objectives 4

VISION 4

Performance Measures 6

1. INTRODUCTION 8

CEDS Update Development Process 9

2. BACKGROUND AND ANALYSIS OF FNSB ECONOMY 10

Introduction 10

Location and Climate 10

Population Trends and Characteristics 12

Housing Trends 25

Physical Infrastructure Profile 35

Institutional Infrastructure 55

Economic Infrastructure 62

3. INDUSTRY CLUSTERS 81

Introduction 81

Industry Clusters Based on Quadrant Analysis 81

Confirming Industry Clusters Via Shift-Share Analysis 86

4. FACTORS AFFECTING ECONOMIC PERFORMANCE 92

Main Factors that relate to economic performance: 92

Other Factors that relate to economic performance: 93

5. STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS ANALYSIS 96

Strengths: 96

Weaknesses: 96

Opportunities: 97

Threats: 98

6. RESILIENCE THROUGH ECONOMIC DIVERSIFICATION AND EMERGENCY MANAGEMENT PLANNING 100

Resilience Through Economic Diversification 100

Resilience Through Emergency Management Planning 102
7. GOALS AND OBJECTIVES 104
VISION 104
8. STRATEGIC PROJECTS 108
ENERGY 108
MILITARY 109
MILITARY/INDUSTRY CLUSTER DEVELOPMENT 109
TOURISM 110
MINING 111
AGRICULTURE 111
INSTITUTIONAL/NON-PROFIT SECTOR 112
PHYSICAL INFRASTRUCTURE 112
9. PERFORMANCE MEASURES 113
APPENDIX A: DATA TABLES 114

EXECUTIVE SUMMARY

The Fairbanks North Star Borough (FNSB) is in the final process of becoming an Economic Development District (EDD) under designation by the US Economic Development Administration (EDA). This document (when adopted) provides the Comprehensive Economic Development Strategy (CEDS) for FNSB and identifies key economic trends, economic goals and objectives and strategic projects and action steps designed to achieve the Borough's economic development goals. The prior CEDS for FNSB was adopted in 2010 and the current CEDS incorporates information from the prior CEDS where still current and appropriate. The first section of the CEDS provides a detailed description of FNSB's physical, social and economic trends and infrastructure.

ECONOMIC ASSESSMENT

LOCATION AND CLIMATE

The FNSB is located in the center of Interior Alaska. Two cities reside within the FNSB, Fairbanks and North Pole, as well as a number of unincorporated communities. The FNSB is Alaska's second most populated borough and residents commonly refer to it as the "Golden Heart of Alaska." Due to its central location, the FNSB is the transportation, trade and service center for the vast Interior and Northern regions of Alaska. The FNSB is the northern terminus of the Alaska Railroad with southern access to the ports of Seward, Anchorage, and Nenana. The FNSB experiences seasonal temperature extremes similar to those of other communities in Interior Alaska, buffered to some extent by the Alaska Range to the south and the Brooks Range to the north. The typical temperatures during the winter months range from 4.8 º F in December, 1.1º F in January, and 10.0º F in February. During summer, temperatures have typically ranged from 71.6º F in June, 72.7º F in July, and 65.9º F in August.

DEMOGRAPHIC AND LABOR FORCE TRENDS AND CHARACTERISTICS

As of 2014, FNSB had a population of 99,357 and is the second largest borough behind the Municipality of Anchorage. The FNSB is slightly larger than the Matanuska-Susitna Borough, which has 97,882 people. Population in the Borough was growing faster than state population until 2010, but then has grown at a slower rate since the recovery from the recession and began to drop from 2013 to 2014. In a matter that caught the attention of local residents, policymakers, and media, the FNSB population declined by 1,450 persons between 2013 and 2014, going from 100,807 to 99,357.[1] Despite the slower population growth recent state projections indicate FNSB should expect to grow faster than the state over the next ten years.

[1]Morrow, Weston, "Fairbanks population continues to shrink" (Fairbanks Daily News-Miner), March 30, 2015 (http://bit.ly/1PQIEO0)

- FNSB has a higher proportion of younger and prime working age population than Alaska as a whole, perhaps in part due to the military and University of Alaska Fairbanks' presence in the Borough.

- The FNSB population has a relatively high educational attainment, with 32.8 percent earning a Bachelor's Degree or above compared to 28 percent for Alaska as a whole. The presence of the University of Alaska Fairbanks (UAF) is a major educational asset in the region.

- FNSB has a lower unemployment rate than the state, due in part to the military and university presence, but chronic underemployment in the private sector also leads to lower per capita incomes and higher rates of poverty than the state as a whole.

PHYSICAL INFRASTRUCTURE

- FNSB serves as a transportation hub for Central Alaska with significant air, rail and road facilities. Airline passenger transportation to Fairbanks dipped during the recession. It has since recovered but has been growing more slowly recently, similar to the population trend. Air cargo dropped significantly and has not recovered since 2008.

- Passenger volumes on the Alaska Railroad to FNSB have also not recovered to 2008 levels. In addition, the conversion of the North Pole refinery from a production facility to a distribution facility has reduced petroleum shipping on the Railroad and reversed the direction from going south to coming north.

- Use of natural gas for heating in FNSB remains very expensive compared to Anchorage due to the lack of a distribution system and a lower cost supply. However, the beginnings of a distribution system are under construction in North Pole, with subsequent phases planned for other areas of FNSB. While pipelines connecting to markets outside of Alaska are in place, in general, there is a lack of natural gas pipelines from oil fields in the north that connect locally, resulting in substantial underutilization of this resource within Alaska. It is worth noting that there is a natural gas distribution system operating in the City of Fairbanks, although this system is mostly commercial in nature. This system is operated by the Fairbanks Natural Gas, LLC (FNG). The State of Alaska's development corporation -- known as the Alaska Industrial Development and Export Authority (AIDEA) -- recently purchased FNG, as well as FNG's distribution system and transportation assets. Officials in the FNSB see a possible merger between the state-owned FNG and the Borough-owned Interior Gas Utility (IGU), which is the entity installing the natural gas distribution system in the City of North Pole.

- FNSB is connected to the fiber optic lines that run from Prudhoe Bay to Anchorage and also has an extensive network of cell towers, with a number of additional towers approved to be constructed. However, recent trends suggest that the number of residential phone customers is declining.

- FNSB is well served with water and wastewater capacity, although revenues declined in 2013.

INSTITUTIONAL INFRASTRUCTURE

- The military bases in FNSB -- Fort Wainwright Army Base and Eielson AFB -- support about 40 percent of total employment in the Borough. Active duty levels have been declining slightly in recent years, but Eielson is about to receive the new F-35s, which will add about 3,000 population including dependents and additional private contractors. In addition to active duty personnel, the bases support substantial private sector employment though direct procurement contracts for supplies and services and also through indirect household spending from base families and personnel. In addition to the active duty military personnel, Fort Wainwright Army Base currently employs 1,188 civilians, while Eielson employs 480 civilians.[2]

- The University of Alaska at Fairbanks (UAF) is the oldest and flagship campus of the University of Alaska System (UA) and has seen continued student increases recently while other campuses have declined. In addition to offering bachelors, graduate and professional degrees, UAF is well integrated into the entire workforce development system in the Borough, and coordinates closely with the Community and Technical College to assist students in finding the proper curriculum for a wide variety of needs. The UA Scholars program has been very successful in attracting top Alaska high school students to enroll at the University of Alaska rather than choose out of state options. The Community and Technical College is organized under the UAF umbrella and is a part of the UA System.

ECONOMIC BASE AND INDUSTRY CLUSTERS

- Total jobs in FNSB grew at an annual rate of 3.2 percent between 2008 and 2014, while the national job growth rate was only 0.4 percent.

- There has been a long term decline in the volume of North Slope oil production, but the recent fall in oil prices has had a particularly adverse effect on public revenues throughout Alaska and in FNSB.

- Mining is growing faster in FNSB than statewide, particularly gold mining, but also sand and rock mining.

- As noted above, the military presence in FNSB constitutes a major source of employment in the region, providing substantial support for the private sector economy. Fort Wainwright Army Base currently employs 1,188 civilians, while Eielson employs 480 civilians.

- In terms of employment, accommodations and food service are key sectors in one of the major clusters in the region (i.e. the tourism cluster), with strong potential for further growth as winter tourism becomes more popular. In addition, a convention center would expand business travel to FNSB.

---

[2] "Fort Wainwright" in US Military Bases (Sun Key Publishing) http://bit.ly/1LmZiRO and "Eielson Air Force Base" in Alaska F-35s (Fairbanks Economic Development Corporation) http://bit.ly/1ihASTb

- Construction industries are highly concentrated in FNSB, much of it related to natural resource extraction operations. The proposed AK LNG natural gas pipeline offers the potential for further diversification and expansion of this industry.

- While the Transportation and Warehousing sector is not especially concentrated in FNSB in terms of employment, this sector is still a critical part of the regional economy in terms of physical infrastructure (i.e. highways, railroads, and pipelines). Additional growth may be possible related to increased winter rail service and improvements to intermodal facilities to accommodate construction of a gas pipeline.

- Manufacturing is not highly represented in FNSB but opportunities may exist to support developing technologies for alternative energy and electrical microgrid systems.

- Since 2002, Fairbanks has been increasing its share of statewide crop production. Farms in Fairbanks tend to be larger than elsewhere in Alaska, but average farm size is decreasing, as the number of farms increases. Farmers are experimenting with a number of new crops that are amenable to the local climate and the area's short growing season. With the addition of improved physical infrastructure (i.e. roads and rail lines), farmers in FNSB are working to lessen Alaskans' dependence on food imported from outside of the state, since Alaska imports 95 percent of its food.[3]

GOALS AND OBJECTIVES

VISION

To improve the Fairbanks North Star Borough residents' quality of life and standard of living by developing goals, establishing objectives and implementing strategies that sustain, enhance or increase economic and social opportunities for local residents.

COMMUNITY ECONOMIC DEVELOPMENT GOALS

COMMUNITY PRIORITY NO.1: Lower and stabilize FNSB energy costs by expanding the energy portfolio with a focus on local resources.

OBJECTIVE: Bring affordable, sustainable natural gas to the Fairbanks North Star Borough.

OBJECTIVE: Support geothermal energy production in and around the Interior region.

OBJECTIVE: Find ways to recover and use waste heat to heat buildings and greenhouses in the FNSB.

OBJECTIVE: Support University of Alaska Fairbanks research to find new ways to provide affordable clean energy in the FNSB and surrounding regions.

---

[3]Kirk Johnson, "In a tough place to farm, discovering much to love: Alaska turns to locally grown food thanks to state incentives" (New York Times) August 31, 2014 (http://nyti.ms/1OQSUW0)

COMMUNITY PRIORITY NO.2: Anchor the missions of Fort Wainwright, Eielson Air Force Base, Fort Greely and Clear Air Force Stations and encourage increased utilization of the existing facilities.

OBJECTIVE: Actively support retention and expansion of the missions at regional military bases.

COMMUNITY PRIORITY NO.3: Develop regional cooperative market program to create larger market for goods and services produced in the Borough.

OBJECTIVE: Coordinate industry cluster strategies and projects to promote export of FNSB products and technologies, particularly in areas of energy micro-grids, mining and unique agricultural products.

ADDITIONAL INDUSTRY CLUSTER DEVELOPMENT GOALS

1. **MINING: MAINTAIN AND EXPAND FNSB'S POSITION AS A GROWING MINING CENTER IN THE STATE**

   OBJECTIVE: Work with industry to provide workforce development, transportation services and other infrastructure to support expansion of mining in FNSB.

2. **ENERGY: STRENGTHEN FNSB'S POSITION AS A HUB OF ENERGY DEVELOPMENT SERVICES AND RESEARCH**

   OBJECTIVE: Develop a stronger support role for the oil and gas industry, including infrastructure and workforce capacity to support construction of a natural gas pipeline.

   OBJECTIVE: Advocate for responsible development of the petrochemical industry in the Borough.

   OBJECTIVE: Position the Interior as an energy research and development hub.

3. **TOURISM: DIVERSIFY VISITOR SERVING ATTRACTIONS AND FACILITIES TO EXTEND THE TOURISM SEASON AND EXPAND THE TYPES OF VISITORS ATTRACTED TO THE BOROUGH.**

   OBJECTIVE: Increase winter tourism through improved transportation services, attractions and enhanced marketing efforts.

   OBJECTIVE: Develop a convention center to increase business visitors.

   OBJECTIVE: Develop a performing arts center to increase entertainment opportunities.

   OBJECTIVE: Expand cooperative marketing programs with the airlines to gain access to new visitor markets.

4. **AGRICULTURE: ENHANCE THE ECONOMIC VIABILITY OF AGRICULTURE BOTH FOR LOCAL CONSUMPTION AND AS AN EXPORT SECTOR**

   OBJECTIVE: Support new product research to find agricultural niches for the Borough.

   OBJECTIVE: Explore the feasibility of community systems for greenhouse heating, fertilizer production and value added processing to increase economic feasibility of agriculture.

OBJECTIVE: Conduct local and external marketing to encourage local consumption of Borough food products as well as promoting external markets for export commodities.

5. **PROMOTE ADDITIONAL DIVERSIFIED INDUSTRIES AND MANUFACTURING**

   OBJECTIVE: Promote wood-products manufacturing industry cluster (i.e. furniture manufacturing and forest products).

   OBJECTIVE: Promote unmanned aircraft systems (UAS) industry.

ECONOMIC FOUNDATIONS

ACCESS TO CAPITAL

OBJECTIVE: Promote community access to venture capital.

BUSINESS CLIMATE

OBJECTIVE: Development community of entrepreneurs.

HUMAN RESOURCES

OBJECTIVE: Develop and retain an educated workforce.

OBJECTIVE: Provide job skills development opportunities.

PHYSICAL INFRASTRUCTURE

OBJECTIVE: Expand the current railroad and market Fairbanks as a natural hub.

OBJECTIVE: Expand and improve water distribution and wastewater collection systems to avoid localized quality and supply issues associated with individual systems.

OBJECTIVE: Expand solid waste recycling capacity to improve the sustainability of the solid waste disposal system.

OBJECTIVE: Support the design, construction and maintenance of trail, road, rail and air transportation systems that improve access to the region.

QUALITY OF LIFE

OBJECTIVE: Support quality in health care, education, public safety, beautification, government and culture that would improve the individual and community quality of life in the FNSB.

PERFORMANCE MEASURES

The performance measures reflect economic and social indicators that would be improved through implementation of the goals, objectives and projects outlined in the CEDS. These indicators would be monitored and reported on annually in the CEDS updates.

1. Total Borough employment growth in relation to statewide employment growth rates.

2. Unemployment rate in relation to state unemployment rate.
3. Employment growth in key industry clusters, including mining, energy, tourism, military contractors, agriculture/food processing, construction and transportation/warehousing.
4. Growth in the number of businesses.
5. Growth in average wage levels.
6. Growth in household income.
7. Dollar value of investments in infrastructure.
8. Educational attainment.
9. Number of graduates of post-secondary training and education institutions and programs.

1. INTRODUCTION

CEDS provides a current assessment of the FNSB economy and opportunities for future growth and development. This 2015 CEDS builds on information contained in the last CEDS adopted in 2010, but adds new information and reflects changing priorities to capitalize on emerging opportunities. The development of the CEDS was undertaken by the Economic Development Commission, under the leadership of Mayor Luke Hopkins.

FAIRBANKS NORTH STAR BOROUGH ECONOMIC DEVELOPMENT COMMISSION

CHAIR

Mayor Karl Kassel
Fairbanks North Star Borough

Mayor Luke Hopkins (former)
Fairbanks North Star Borough

APPOINTED BY THE MAYOR

Mayor John Eberhart
City of Fairbanks

Kelly L. Brooks
Doyon Limited

Mayor Bryce Ward
City of North Pole

Fred Schlutt
University of Alaska Cooperative Extension

Paul Robinson, CPA
Robinson & Associates

Russell E. Talvi
Alaska Small Business Development Center

APPOINTED BY THE FNSB ASSEMBLY PRESIDING OFFICER

Christopher Quist
FNSB Assembly

Van Lawrence
FNSB Assembly

CEDS UPDATE DEVELOPMENT PROCESS

FNSB has maintained a CEDS since 2002, beginning its development process in 1999 with an Economic Summit attended by more than 300 Borough residents. The CEDS is a living document, and has undergone updates and refinements through the years since its initial adoption. The CEDS reflects the Borough's vision and economic strategic goals. As progress is achieved and new goals identified, the plan continues to evolve to meet new challenges.

The 2015 CEDS Update process is scheduled to occur between May 2015 and January 2016. FNSB engaged a contractor, Applied Development Economics (ADE), to undertake the CEDS Update. ADE began the process by meeting with economic development stakeholders in FNSB in June and producing the regional economic analysis presented in Chapter 2 of this report. Subsequent steps included further identification and refinement of implementation projects and action strategies to address the Borough's economic development goals. The FNSB Economic Development Commission met several times to review drafts of the CEDs and provide input to the consultant, including September 29th, November 3rd and November 24th. At this last meeting, the ED Commission voted to recommend review and approval by the FNSB Planning Commission.

2. BACKGROUND AND ANALYSIS OF FNSB ECONOMY

INTRODUCTION

The descriptive data and economic analysis for the CEDS is comprised of five broad, yet inter-related sections, beginning with a discussion of the Borough's natural environment and climate ("Location and Climate"), which serves as the physical backdrop of the area's population trends, for which are discussed in the following section ("Demographic and Labor Force Trends and Characteristics"). The social and economic well-being of the population is facilitated by local infrastructure, which is discussed in detail in the third section called "Physical Infrastructure". Through the advancement of knowledge, institutions such as centers of advanced education are another type of infrastructure conducive to well-being, which is the fourth of five sections in the data and analysis portion of the CEDS. The final section of this chapter examines the region's economic base ("Economic Base and Industry Clusters: Data, Trends and Analyses").

LOCATION AND CLIMATE

FNSB is located in the center of Interior Alaska. Two cities reside within the FNSB, Fairbanks and North Pole, as well as the unincorporated communities of College, Ester, Fox, Harding-Birch Lakes, Moose Creek, Pleasant Valley, Salcha, and Two Rivers. The FNSB lies within the Tanana Valley, which stretches east to the Canadian border. The City of Fairbanks lies on the banks of the Chena River, which drains into the Tanana River immediately south of the city. The City of North Pole lies 14 miles southeast of Fairbanks between the Fort Wainwright Army Post and Eielson Air Force Base. The Chatanika, Chena, and Salcha River drainages define the area to the north, east and west of the urban centers. [4]

LOCATION

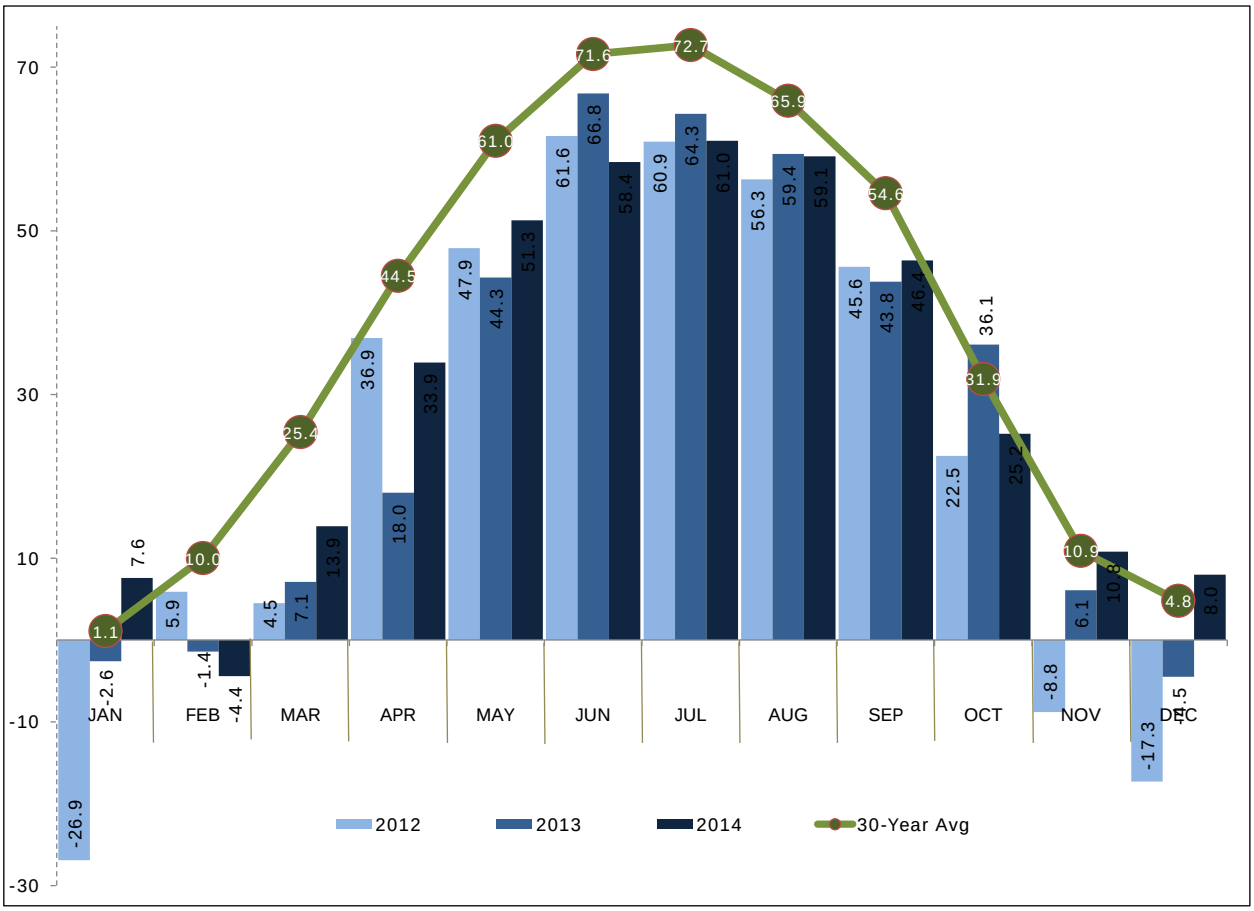
FNSB is Alaska's second most populated borough and residents commonly refer to it as the "Golden Heart of Alaska." Due to its central location, the FNSB is the transportation, trade and service center for the vast Interior and Northern regions of Alaska. The FNSB is the northern terminus of the Alaska Railroad with southern access to the ports of Seward, Anchorage, and Nenana. The Richardson, Parks, Steese and Elliot Highways connect the FNSB to Valdez, Prudhoe Bay, Anchorage, Canada and the Continental United States. The FNSB's location along transpolar air routes makes it logistically attractive for global air transportation and military operations.

[4] FNSB, "2011: Comprehensive Economic Development Strategy", page 13

CLIMATE

The FNSB experiences seasonal temperature extremes similar to those of other communities in Interior Alaska. The Alaska Range to the south, keeps the wet, humid, coastal weather at bay. The Brooks Range to the north protects the Interior from harsh Arctic winds. Over the last 30 years, Winter month temperatures have averaged 4.8 ºF in December, 1.1ºF in January, and 10.0ºF in February. Over the last 30 years, Summer temperatures have averaged 71.6ºF in June, 72.7ºF in July, and 65.9ºF in August. While temperatures for Winter over the past thirty years have averaged 5.3ºF (i.e. average of 4.8ºF in December, 1.1ºF in January, and 10.0ºF in February), FNSB has recorded Winter temperatures of –40ºF or colder. Likewise, temperatures during the Summer months on a number of occasions have exceeded the thirty-year average of 70.1 ºF, with temperatures having reached 90ºF and above occasionally.

FIGURE 1



Interestingly, in comparing average temperatures for each month for the past three years, on a number of occasions Winter and Summer monthly averages have been lower than the thirty-year average. For example, the FNSB thirty-year average for the month of February is 10.0º F, although in recent years, FNSB exhibited lower February averages, at 5.9º F in 2012, -1.4º F in 2013 and -4.4º F in 2014. A similar trend has occurred during Summer. The thirty-year average for June is 71.6º F. In

the last three years, FNSB recorded an average of 61.6º F in June 2012, 66.8º F in June 2013, and 58.4º F in June 2014.

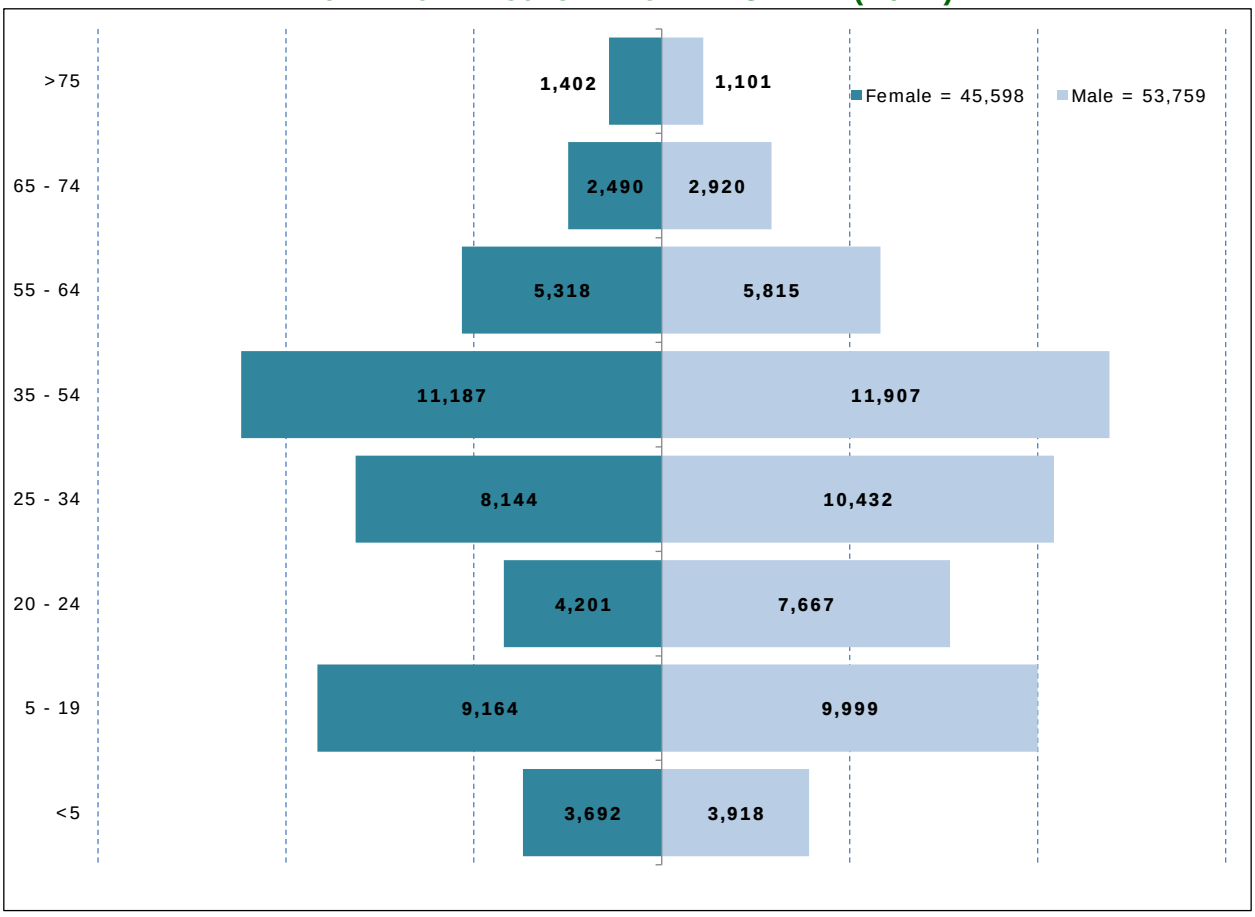
POPULATION TRENDS AND CHARACTERISTICS

According to the most current population estimate issued by the US Census American Community Survey (ACS), 99,357 persons reside in FNSB, making this the second largest borough in the State of Alaska, trailing the Municipality of Anchorage with 301,010 people. The FNSB is slightly larger than the Matanuska-Susitna Borough, which has 97,882 people. Approximately 13.7 percent of Alaska's 735,132 residents are in FNSB. The following sections analyze FNSB's population by gender, age, race and ethnicity, as well as FNSB's future population.

GENDER AND AGE

Population in FNSB had increased over time at a somewhat steady clip, although in recent times, the Borough has experienced considerable fluctuation. Between 2000 and 2010, FNSB's population grew by 1.7 percent a year, from 82,840 to 97,581. From 2010 to 2013, the annual percentage increase had slowed to one percent, resulting in the 2013 population of 100,436. However, in 2014, the FNSB population fell to 99,357, for a loss of 1,450 persons in one year. Alaska has grown at a steady clip, growing annually by 1.3 percent between 2000 and 2010, then dropping off slightly to 1.2 percent a year from 2010 to 2013. Alaska's population also declined from 2013 to 2014, dropping slightly to 736,732 from 737,259.

FIGURE 2
FAIRBANKS NORTH STAR BOROUGH POPULATION PYRAMID:
NUMBER OF PERSONS BY AGE AND GENDER (2014)



Similar to the state as a whole, 2.8 percent of FNSB's total population is in the 75 and older cohort. However, in FNSB, of the 2.8 percent, 1.7 percent of FNSB's total population is women 75 and older, and 1.1 percent is 75-plus males. In the state, women and men older than 75 are each 1.4 percent of total population. Moreover, 9.4 percent of residents statewide are 65 and older, versus 7.9 percent of FNSB. Compared to the state, FNSB also has a higher proportion of total population in the young adults (20-24 and 25 to 34) cohort: 30.3 percent (or 30,444) of FNSB's 99,357 residents are between 20 and 34, whereas 24.6 percent (181,113) of the state's 736,732 residents are between 20 and 34.

FIGURE 3

FNSB POPULATION PYRAMID: DISTRIBUTION OF PERSONS BY GENDER AND AGE (2014)

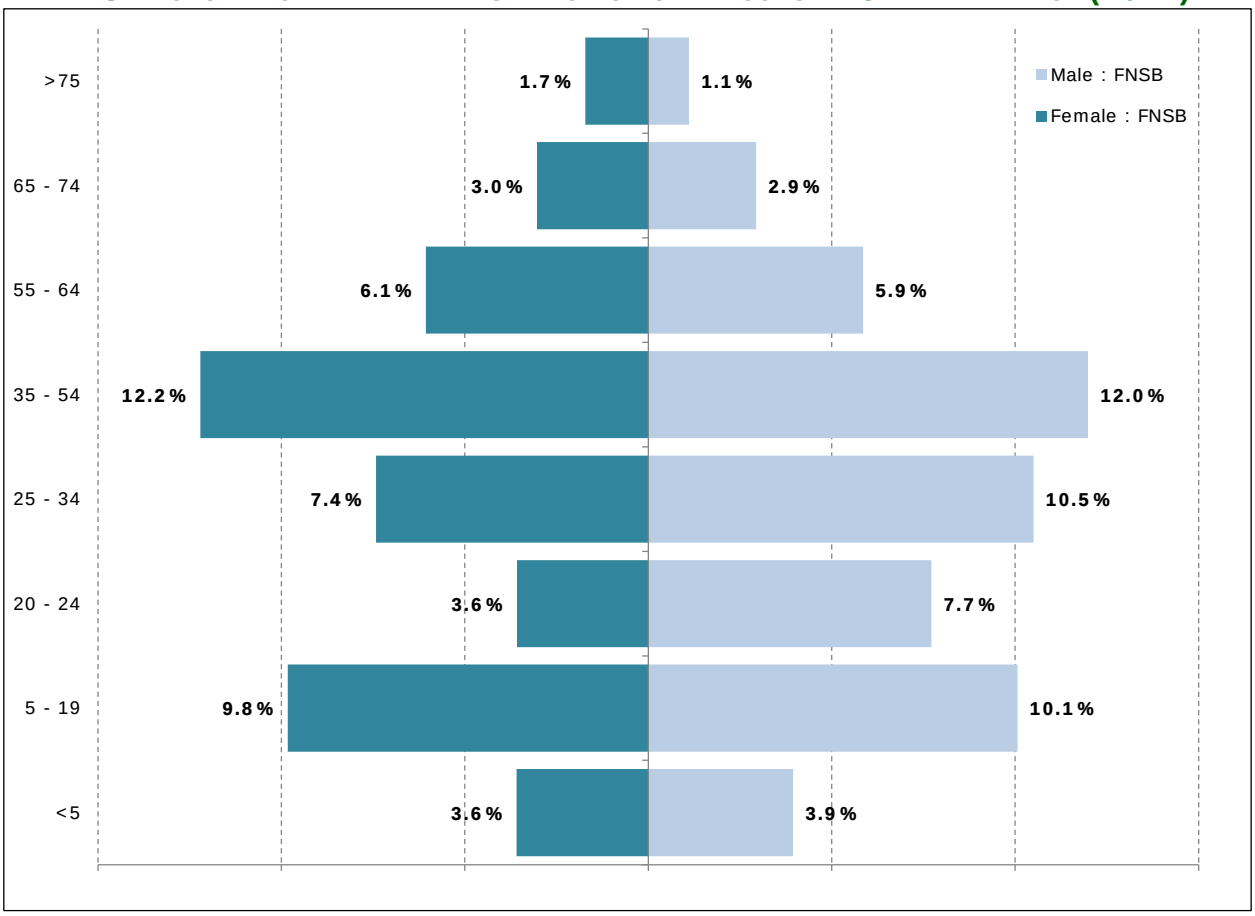
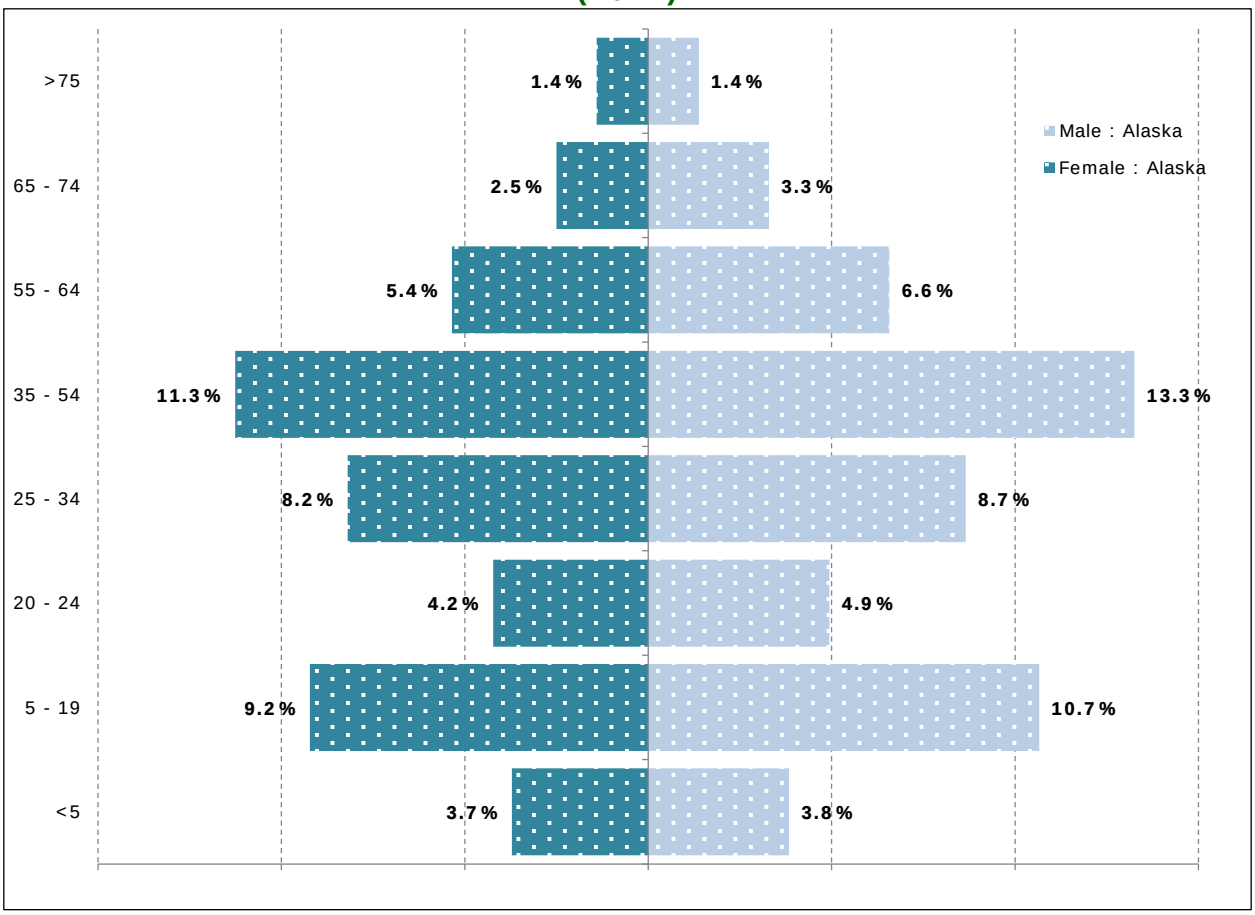


FIGURE 4

STATE OF ALASKA POPULATION PYRAMID: DISTRIBUTION OF POPULATION BY GENDER AND AGE (2014)

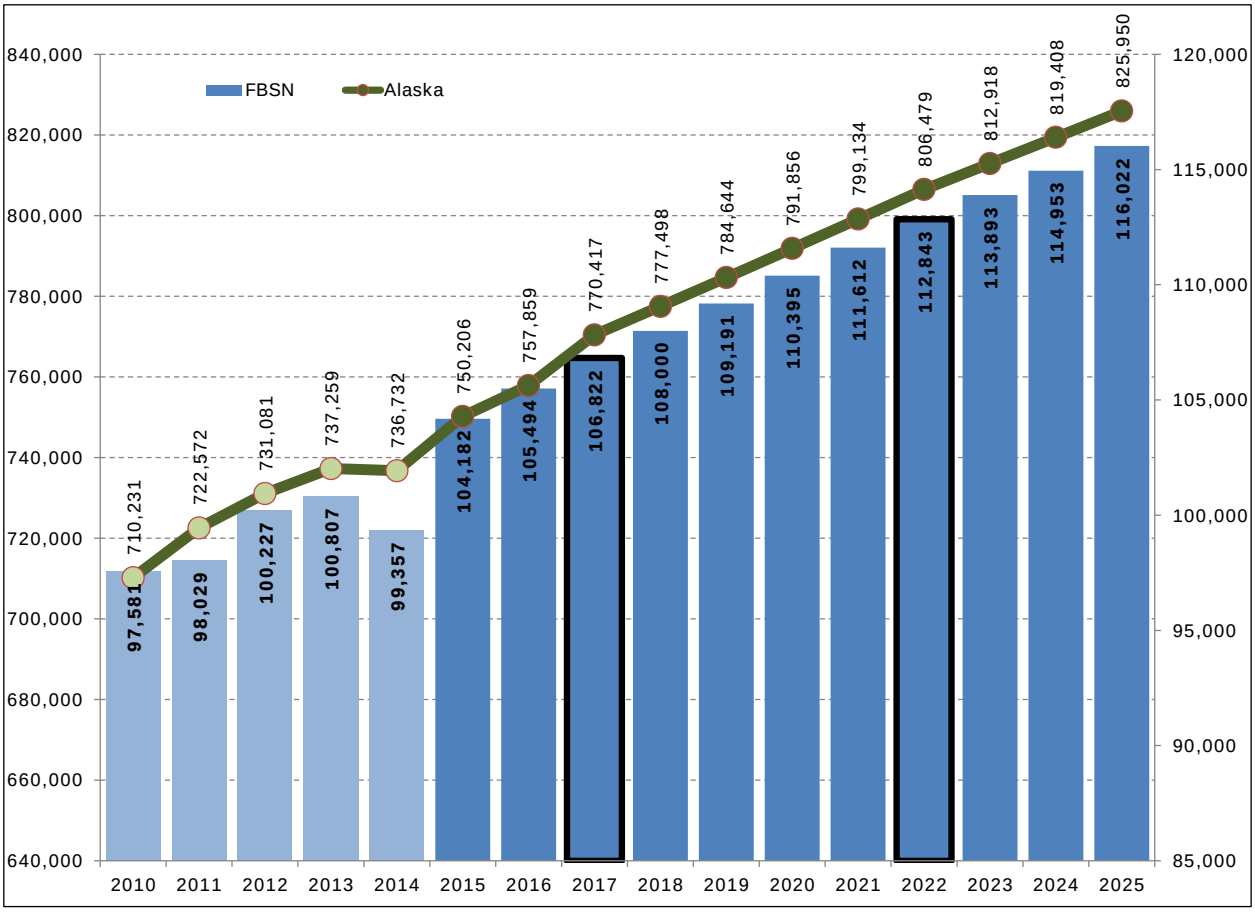


POPULATION PROJECTIONS

According to population projections issued by the State of Alaska, the FNSB is expected to grow to 106,822 persons by 2017, and to 112,843 and 116,022 by 2022 and 2025 respectively. The chart below includes population estimates for FNSB and Alaska from the US Census for the years 2010, 2011, 2012, 2013 and 2014, and then includes annual population projections starting in 2015 and continuing to 2025.

FIGURE 5

POPULATION TRENDS AND PROJECTIONS: FNSB AND ALASKA



For the 2012-2017, 2017-2022, and 2022-2027 5-year periods, the Research and Analysis Division of Alaska's Department of Labor and Workforce Development projects annual growth rates of 1.3 percent, 1.1 percent, and 0.9 percent respectively. State officials project that the state will grow at slightly slower rates over the same five-year periods, by 1.0 percent a year between 2012-2017, 0.9 percent a year between 2017-2022, and 0.8 percent a year between 2022-2027.

RACE AND ETHNICITY

Of the 99,357 persons in FNSB, 71.3 percent (or 70,808) are White, with Latinos as the next largest racial/ethnic group at 7.7 percent (or 7,672 persons). The number of Latinos grew at an annual clip of 4 percent between 2010 and 2014; between 2000 and 2010, Latinos were also the fastest growing racial/ethnic group in FNSB, having increased by 5 percent a year in that decade. Native Alaskan/Americans are the third largest group in the FNSB, at 6,820 people (or 6.9 percent). The African-American population has fluctuated in FNSB, going from 4,719 in 2000, down to 4,154 in 2010, and back up to 4,935 in 2014.

TABLE 1

TRENDS IN PERSONS BY RACE AND ETHNICITY (LATINO ONLY) : FAIRBANKS NORTH STAR BOROUGH AND ALASKA

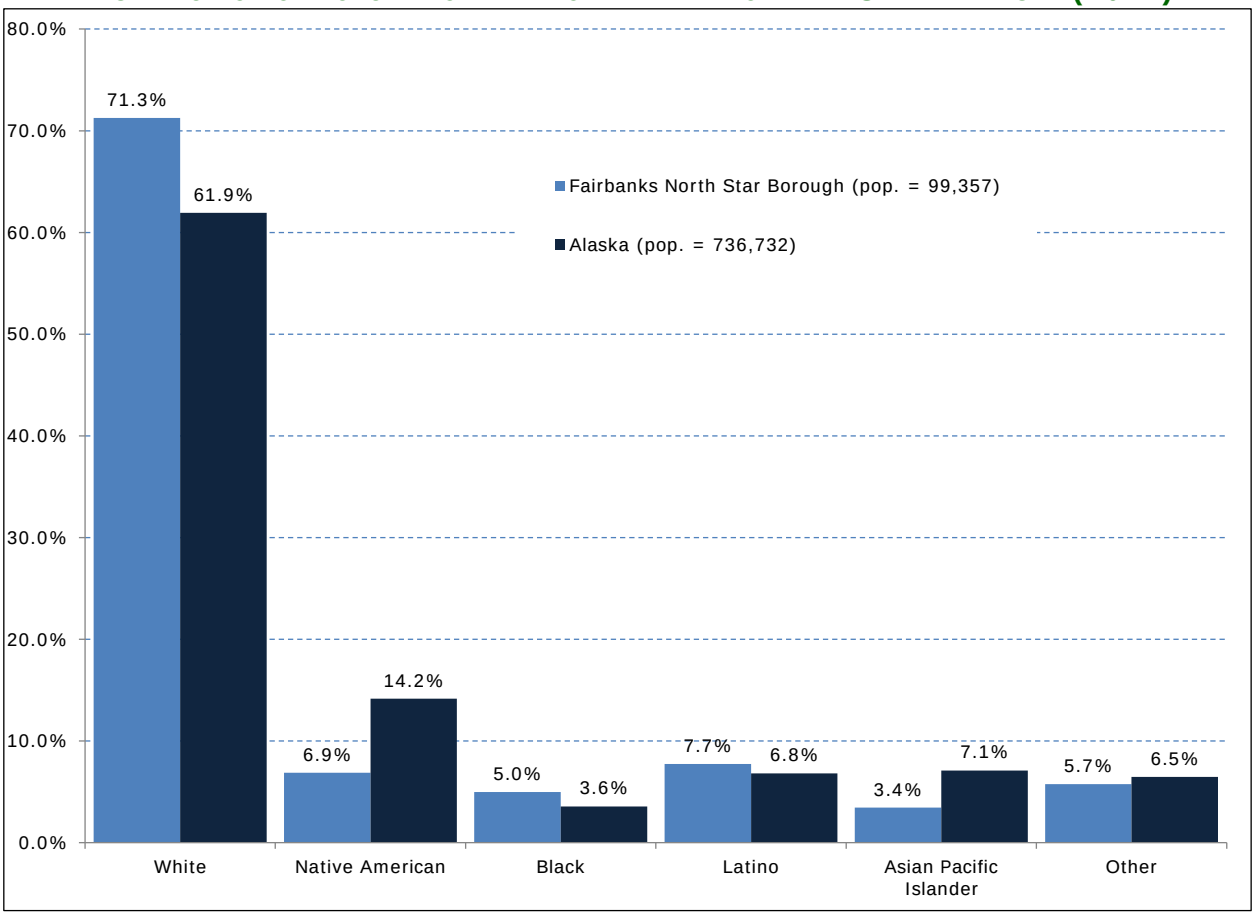
	FAIRBANKS NORTH STAR BOROUGH					
RACE / ETHNICITY	2000	2010	2014	2014 DISTRIBUTION	00-10 CAGR	10-14 CAGR
Total	82,840	97,581	99,357		2%	0%
White	62,942	72,259	70,808	71.3%	1%	-0.5%
Native Alaskan/American	5,596	6,669	6,820	6.9%	2%	1%
Black	4,719	4,154	4,935	5.0%	-1%	4%
Latino	3,440	5,651	7,672	7.7%	5%	8%
Asian Pacific Islander	1,919	2,887	3,410	3.4%	4%	4%
Other	4,224	5,961	5,712	5.7%	4%	-1%
	ALASKA					
RACE / ETHNICITY	2000	2010	2014	2014 DISTRIBUTION	00-10 CAGR	10-14 CAGR
Total	626,932	710,231	736,732		1%	1%
White	423,788	455,320	456,312	61.9%	1%	0.1%
Native Alaskan/American	96,505	102,556	104,272	14.2%	1%	0.4%
Black	21,073	21,949	26,171	3.6%	0.4%	4%
Latino	25,852	39,249	50,178	6.8%	4%	6%
Asian Pacific Islander	27,922	44,678	52,219	7.1%	5%	4%
Other	31,792	46,479	47,580	6.5%	4%	1%

Source: Applied Development Economics, based on US Census 2000 STF1 Table P008 and 2010 SF3 Table P5, US Census ACS 2013 1-year Sample Table C03002, and US Census 2014 Population Estimates [http://bit.ly/1LlDybI] : NOTE: CAGR = compound annual growth rate

Whereas Native Alaskans/Americans comprise 6.9 percent (6,820) of FNSB's population, in the state as a whole, Native Alaskans/ Americans are 14.2 percent (104,272) of total population. Similarly, Asian-Pacific Islanders as a proportion of statewide population is twice as large as Asian-Pacific Islanders as a proportion of FNSB population, at 7.1 percent (or 52,219) versus 3.4 percent (3,410).

FIGURE 6

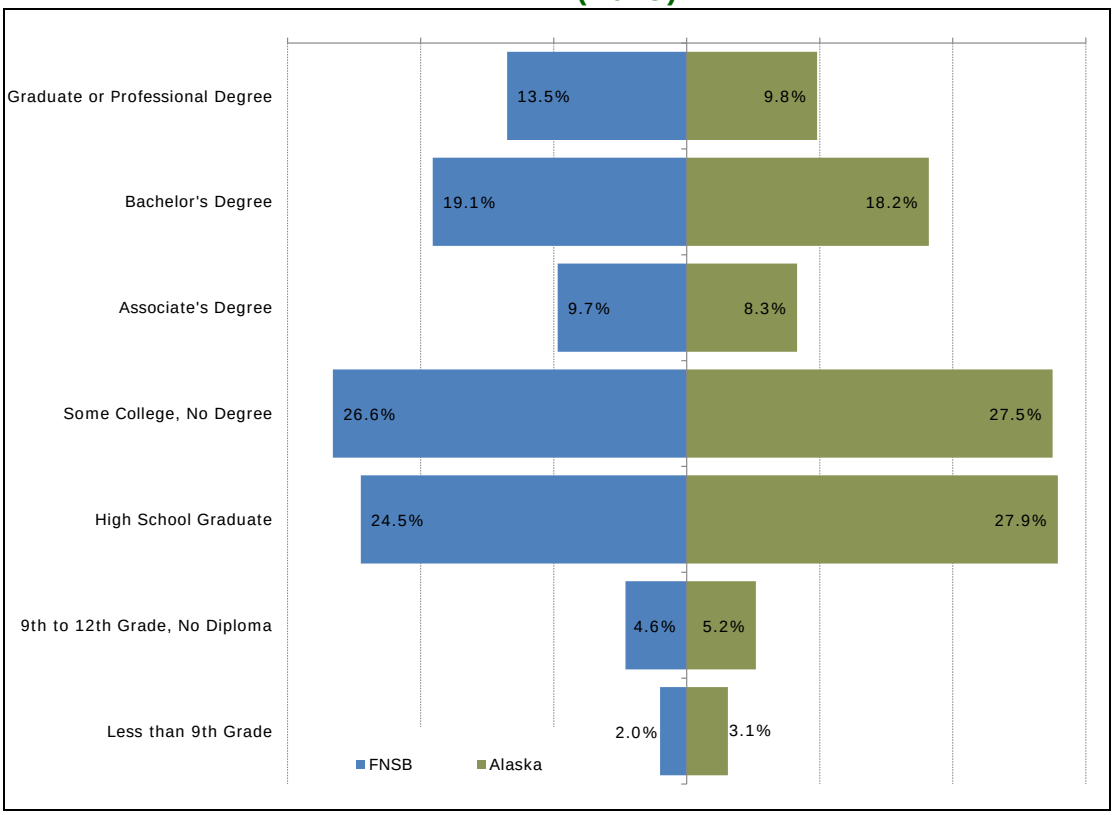
DISTRIBUTION OF POPULATION BY RACE AND ETHNICITY: FNSB AND ALASKA (2014)



EDUCATIONAL ATTAINMENT

According to the latest data available from the US Census ACS, of the 60,629 persons who are 25 years and older, 8,185 have a graduate degree, such as a Master's, PhD or professional degree. In addition, 11,580 persons have a Bachelor's degree. In other words, 32.6 percent of all persons 25 and over in the FNSB have at least a Bachelor's degree, versus 28.0 percent for the state a whole.

FIGURE 7
DISTRIBUTION OF PERSONS 25 AND OVER BY EDUCATIONAL ATTAINMENT: FNSB AND ALASKA (2013)



The number of persons with a graduate degree in the FNSB increased annually by an estimated 13 percent over the short 2010-2013 period, from 5,730 to 8,185.[5] The number of persons with a Bachelor's also increased steadily, from 10,982 in 2010 to an estimated 11,580 in 2013. Of the 45,341 persons with a graduate degree in Alaska, 18.1 percent are in FNSB (i.e. 8,185/45,341).

[5]See Appendix Table 43

Labor Force: Employment and Unemployment

There were 46,925 persons in FNSB's civilian labor force in 2014. Of this amount, 44,216 were employed and 2,709 were unemployed, resulting in an all-year unemployment rate of 5.8 percent. The state experienced a jobless rate that was one percentage-point higher at 6.8 percent.

Table 2
Annual Trends in Civilian Labor Force: Labor Force, Employed Labor Force, Unemployed Labor Force, and Unemployment Rates (Not Seasonally Adjusted): Fairbanks North Star Borough and Alaska

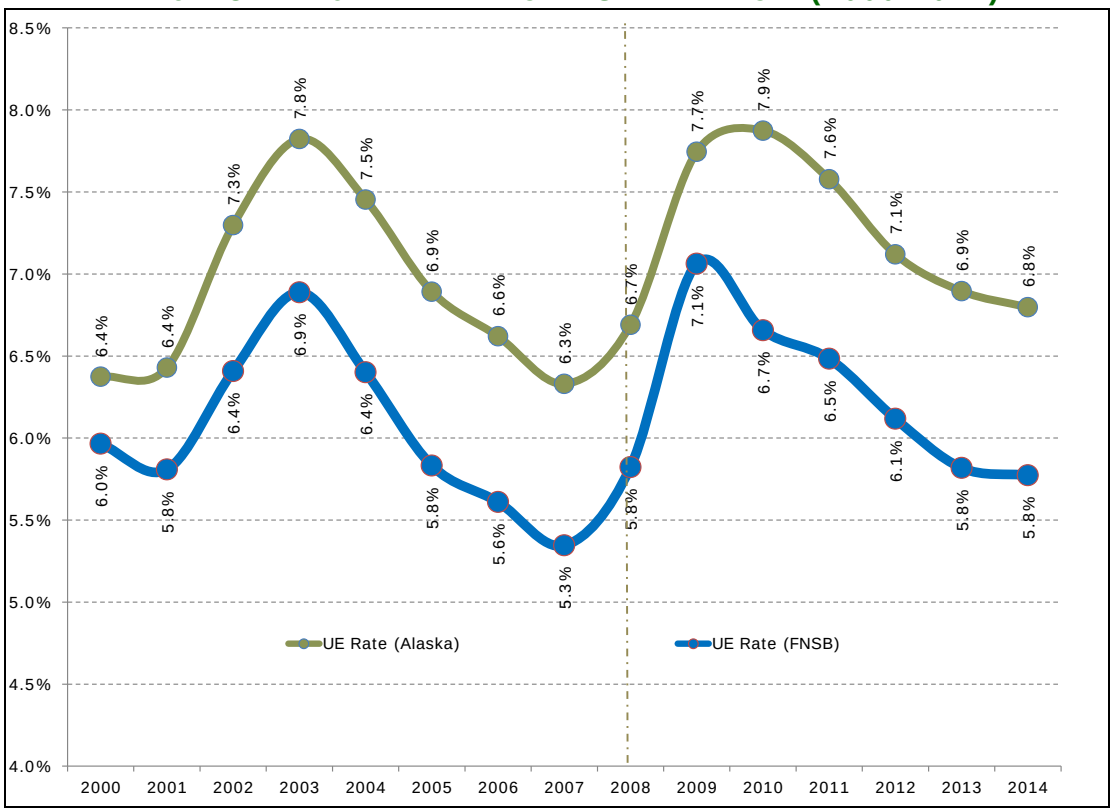
Year	Labor Force	Employed	Unemployed	UE Rate (FNSB)	Labor Force	Employed	Unemployed	UE Rate (Alaska)
08-14 CAGR	0.3%	0.4%	0.2%		0.5%	0.5%	0.8%	
00-08 CAGR	1.5%	1.5%	1.1%		1.4%	1.3%	2.0%	
2014	46,925	44,216	2,709	5.8%	367,166	342,210	24,956	6.8%
2013	47,351	44,596	2,755	5.8%	365,537	340,332	25,205	6.9%
2012	48,238	45,287	2,951	6.1%	365,681	339,645	26,036	7.1%
2011	48,184	45,060	3,124	6.5%	366,003	338,268	27,735	7.6%
2010	48,103	44,901	3,202	6.7%	361,913	333,416	28,497	7.9%
2009	45,856	42,617	3,239	7.1%	359,647	331,792	27,854	7.7%
2008	45,972	43,295	2,677	5.8%	356,109	332,285	23,824	6.7%
2007	45,476	43,045	2,431	5.3%	350,785	328,579	22,206	6.3%
2006	45,111	42,580	2,531	5.6%	349,691	326,542	23,149	6.6%
2005	45,214	42,577	2,637	5.8%	344,559	320,811	23,748	6.9%
2004	44,462	41,616	2,846	6.4%	336,742	311,642	25,100	7.5%
2003	43,236	40,258	2,978	6.9%	331,669	305,722	25,946	7.8%
2002	42,089	39,392	2,697	6.4%	326,400	302,579	23,820	7.3%
2001	41,442	39,035	2,407	5.8%	321,393	300,731	20,662	6.4%
2000	40,952	38,509	2,443	6.0%	319,511	299,145	20,365	6.4%

Source: Applied Development Economics, based on State of Alaska Dept. of Labor and Workforce Development, Research and Analysis ("Fairbanks North Star Borough: Not Seasonally Adjusted Labor Force Data" [http://bit.ly/1LZdpka]). Note: CAGR = compound annual growth rate.

Interestingly, at the height of the Great Recession – during the years 2008, 2009, and 2010 – FNSB unemployment levels jumped from 5.8 percent in 2008 to 7.1 percent in 2009, and then dropped to 6.7 percent in 2010, and further dropped to 6.5 percent in 2011. In the state, unemployment levels spiked from 2008 to 2009, and continued to climb into 2010, and then in 2011 fell below the previous year's level. While unemployment in FNSB did not reach 2008 levels until 2013 when FNSB's rate of joblessness returned to 5.8 percent, the unemployment data suggest FNSB fared better than the state going into (2008 through 2010) and coming out (2011 to now) of the Great Recession. Historically, unemployment levels in the FNSB have been approximately one percentage-point below statewide levels.

FIGURE 8

ANNUAL UNEMPLOYMENT TRENDS: FNSB AND ALASKA (2000-2014)



LABOR FORCE BY SECTOR

In an effort to understand how FNSB fared relatively better than the state as a whole through the Great Recession, we applied most-current ACS data on the economic sectors in which FNSB's civilian labor force are employed against employment data from Alaska's Department of Labor and Workforce Development. Over the five-year 2009-2013 period, there were 44,492 civilians annually employed in FNSB. Applying ACS labor force data covering the same five-year period, we estimate that, of the 44,492 employed persons, 6,689 (or 15.0 percent) worked in Public Administration, and another 4,490 (10.1 percent) worked in Construction. In comparison, 7.6 percent of employed persons in the state are in Construction, and 11.5 percent are in Public Administration. Construction performed better than the state as a whole because FNSB is known to be a staging ground for highway projects, mining activity, and oil-natural gas production occurring outside of the FNSB in the North Slope or interior regions of Alaska. With respect to Public Administration, FNSB exhibited higher rates of public sector workers than the state due to the presence of the military facilities in the FNSB. Of the persons employed in Public Administration, a number are civilians working at one of two military bases in the FNSB: Fort Wainwright Army Base currently employs 1,188 civilians, while Eielson AFB employs 480 civilians.[6] Thus, it is likely that the Construction and Public Administration sectors shielded the FNSB

[6] "Fort Wainwright" in US Military Bases (Sun Key Publishing) http://bit.ly/1LmZiRO and "Eielson Air Force Base" in Alaska F-35s (Fairbanks Economic Development Corporation) http://bit.ly/1ihASTb

from the full brunt of economic headwinds of the 2008-2011 Great Recession that significantly affected the state as a whole, as well as the nation.

TABLE 3
COMPARISON OF CIVILIAN EMPLOYED LABOR FORCE BY SECTOR:
FAIRBANKS NORTH STAR BOROUGH VERSUS STATE

	FNSB 5-YEAR AVG.	STATE 5-YEAR AVG.	FNSB 5-YEAR AVG.	STATE 5-YEAR AVG.	FNSB-V-STATE
	44,492	**336,693**	**100.0%**	**100.0%**	**13.2%**
Agriculture, forestry, hunting, and mining	2,040	18,625	4.6%	5.5%	11.0%
Construction	4,490	25,587	10.1%	7.6%	17.5%
Manufacturing	509	12,740	1.1%	3.8%	4.0%
Wholesale trade	440	6,380	1.0%	1.9%	6.9%
Retail trade	6,322	36,839	14.2%	10.9%	17.2%
Transportation and warehousing, and utilities	3,218	26,041	7.2%	7.7%	12.4%
Information	353	6,504	0.8%	1.9%	5.4%
Finance, insurance, real estate & rental leasing	1,608	13,932	3.6%	4.1%	11.5%
Professional, scientific, and management, and administrative and waste management services	3,448	28,589	7.7%	8.5%	12.1%
Educational and health care & social assistance	9,683	78,752	21.8%	23.4%	12.3%
Arts, entertainment, and recreation, and accommodation and food services	3,500	29,802	7.9%	8.9%	11.7%
Other services, except public administration	2,192	14,054	4.9%	4.2%	15.6%
Public administration	6,689	38,848	15.0%	11.5%	17.2%

Source: Applied Development Economics, based on US Census 5-Year 2009-2013 Sample Table S2405 and Alaska Dept. of Labor and Workforce Development, Research and Analysis Division ("Fairbanks North Star Borough: Not Seasonally Adjusted Labor Force Data" [http://bit.ly/1LZdpka])

PER CAPITA PERSONAL INCOME

While employment data indicates that FNSB fared relatively better than the state as a whole, FNSB personal per capita income trails that of the state in several respects. At $45,313, personal per capita income is approximately 90 percent of Alaska's personal per capita income, which was $50,150 in 2013.[7] In addition, FNSB personal per capita income has grown at 1.5 percent a year since 2008, while growing statewide at 2.2 percent a year.

[7] The BEA's personal income and personal per capita income measures are different from income data reported by the US Census, which is solely money income. While the US Census includes strictly money income on a pre-tax basis when calculating personal and household income, the US BEA includes those measures and more. For example, when calculating personal income, the US BEA includes "employer contributions for employee pensions and insurance fund" and "employer contributions for governmental insurance", as well as "medical benefits." The US Census does not include these components when computing income. Also, the US BEA backs-out "employee and self-employed contributions for government social insurance." The US Census includes these contributions in tracking income on a pre-tax basis. It is also important to note that in a few instances the US BEA employs a different methodology for calculating income in categories also utilized by the US Census. For example, when

TABLE 4
ANNUAL TRENDS IN PERSONAL PER CAPITA INCOME :
FAIRBANKS NORTH STAR BOROUGH AND ALASKA

ANNUAL TRENDS IN PERSONAL PER CAPITA INCOME : FAIRBANKS NORTH STAR BOROUGH AND ALASKA					
PER CAP INCOME	2000	2008	2013	00-08 CAGR	08-13 CAGR
FNSB	$29,416	$41,974	$45,313	4.5%	1.5%
Alaska	$31,491	$45,021	$50,150	4.6%	2.2%
FNSB-v-State	93.4%	93.2%	90.4%		

Source: Applied Development Economics, based on US BEA "CA1: Personal per Capita Income Summary". Note: CAGR = compound annual growth rate.

Two things are driving FNSB personal per capita income trends relative to the state. Of FNSB's 2013 $45,313 in personal per capita income, $36,795 is attributable to wage and/or proprietor income. For the state as a whole, wage and/or proprietor per capita income is $40,804, or slightly over $4,000 more than FNSB's. Moreover, the wage and/or proprietor income portion of the FNSB personal per capita income has grown by 1.8 percent a year since 2008, whereas in the state as a whole, this component has grown by almost three percent a year. Transfer payments on a per capita basis are somewhat higher for the state versus for FNSB. Of the state's $50,150 in personal per capita income, $7,087 is attributable to transfer payments, versus the amount of transfer payments attributable to FNSB's overall personal per capita income, or $6,479.

comparing "interest, dividend and rental income" for the same area, the US Census typically reports a lower aggregate amount that what the BEA reports. The same holds true for proprietor income. As a result, the BEA per capita personal income tends to be higher than US Census' per capita income for the same area and time.

TABLE 5

ANNUAL TRENDS IN PERSONAL PER CAPITA TRANSFER PAYMENTS : FAIRBANKS NORTH STAR BOROUGH AND ALASKA

	2000	2008	2013	00-08 CAGR	08-13 CAGR
Personal Per Capita Income: FNSB	**$29,416**	**$41,974**	**$45,313**	**4.5%**	**1.5%**
Per capita earning by place of work (wage and proprietor income)	*$23,489*	*$33,735*	*$36,795*	*4.6%*	*1.8%*
Less: Per capita contributions for government social insurance 1/	*$2,432*	*$3,500*	*$3,879*	*4.7%*	*2.1%*
Plus: Per capita adjustment for residence 2/	*-$2,448*	*-$3,713*	*-$3,870*	*5.3%*	*0.8%*
Plus: Per capita dividends, interest, and rent 3/	*$6,108*	*$8,413*	*$9,787*	*4.1%*	*3.1%*
Plus: Per capita personal current transfer receipts	*$4,698*	*$7,039*	*$6,479*	*5.2%*	*-1.6%*
Personal Per Capita Income: Alaska	$31,491	$45,021	$50,150	4.6%	2.2%
Per capita earning by place of work (wage and proprietor income)	*$25,195*	*$35,322*	*$40,804*	*4.3%*	*2.9%*
Less: Per capita contributions for government social insurance 1/	*$2,618*	*$3,700*	*$4,323*	*4.4%*	*3.2%*
Plus: Per capita adjustment for residence	*-$1,462*	*-$2,214*	*-$2,518*	*5.3%*	*2.6%*
Plus: Per capita dividends, interest, and rent	*$5,487*	*$7,967*	*$9,099*	*4.8%*	*2.7%*
Plus: Per capita personal current transfer receipts	*$4,889*	*$7,645*	*$7,087*	*5.7%*	*-1.5%*

Source: Applied Development Economics, based on US BEA "C4 - Components of Personal Income" for FBSN and Alaska (US BEA notes: 1/Employer contributions for government social insurance are included in earnings by industry and earnings by place of work, but they are excluded from net earnings by place of residence and personal income. Employee and self-employed contributions are subtractions in the calculation of net earnings by place of residence and all of the income measures. 2/The adjustment for residence is the net inflow of the earnings of inter area commuters. For the United States, it consists of adjustments for border workers and US residents employed by international organizations and foreign embassies.

POVERTY

According to the Census ACS, 7,442 persons live at or below the 100 percent poverty threshold in FNSB, meaning that the poverty rate for the borough is 7.4 percent, reversing a downward trend that saw the poverty rate go from 7.5 percent in 2000 to 6.8 percent in 2010. While the number of persons in poverty declined by 1.1 percent in the state between 2010 and 2013, in FNSB, the number of persons in poverty increased annually by 4.2 percent over the same period. While the number of persons in poverty has been trending upward in FNSB, the Borough does not have a disproportionate share of persons in poverty: 13.7 percent of all people of all income reside in FNSB, while 11.1 percent of all persons in poverty in the state also reside in FNSB.

TABLE 6

TRENDS IN PERSONS AT OR BELOW 100 PERCENT POVERTY LINE: FAIRBANKS NORTH STAR BOROUGH VERSUS ALASKA

	ALASKA			FAIRBANKS NORTH STAR BOROUGH			FNSB VS. STATE	
	TOTAL	PERSONS AT OR BELOW 100 POVERTY	POVERTY RATE	TOTAL	PERSONS AT OR BELOW 100 POVERTY	POVERTY RATE	FNSB AS PERCENT OF STATE	FNSB POVERTY AS PERCENT OF STATE POVERTY
10-13 CAGR	1.2%	-1.1%		1.0%	4.2%			
00-10 CAGR	1.3%	1.9%		1.7%	0.6%			
2013	735,132	67,016	9.1%	100,436	7,442	7.4%	13.7%	11.1%
2010	710,231	69,279	9.8%	97,581	6,587	6.8%	13.7%	9.5%
2000	626,932	57,602	9.2%	82,840	6,206	7.5%	13.2%	10.8%

Source: Applied Development Economics, based on US Census 2000 SF3 Table B87, and US Census ACS 2010 1-Year Sample B17001, and 2013 1-Year Sample B17001. Note: CAGR: compound annual growth rate.

HOUSING TRENDS

This part of the report analyzes trends in housing in the FNSB. In the first part of the analysis below, we present findings with respect to housing supply in the FNSB. Included in this discussion is data on housing quality. In the second sub-section, we discuss trends with regard to housing demand, presenting findings with regard to monthly rents and sales prices of homes. Finally, this section presents information on the adequacy of the housing stock in FNSB to service increase in population due to the basing of two F-35A fighter jet squadrons at Eielson Air Force Base.

HOUSING SUPPLY TRENDS

According to the most current data from the US Census American Community Survey (ACS - 2014), there are 41,694 housing units in FNSB (Table 7). Of the 41,694 units, 20,183 are owner-occupied, resulting in a home-ownership rate of 48.4 percent. Excluding vacant units, the home-ownership rate is 56.5 percent. In comparison, the home-ownership rate for the state as a whole is 50.7 percent (156,006 units out of 307,628 total units); excluding vacant units, the statewide home-ownership rate is 62.4 percent. Of the 41,694 housing units in FNSB, 6,002 (14.4 percent) were vacant in 2014. In the state, 18.8 percent of all housing units were vacant.

TABLE 7
TRENDS IN TOTAL NUMBER OF HOUSING UNITS BY TENURE IN FAIRBANKS NORTH STAR BOROUGH AND ALASKA: 2000 - 2014

	2000	2008	2014	00-08 CAGR	08-14 CAGR
Alaska	260,978	283,403	307,628	1.0%	1.4%
Owner-Occupied	*138,509*	*154,334*	*156,006*	*1.4%*	*0.2%*
Renter-Occupied	*83,091*	*83,273*	*93,653*	*0.0%*	*2.0%*
Vacant	*39,378*	*45,796*	*57,969*	*1.9%*	*4.0%*
FNSB	33,291	38,005	41,694	1.7%	1.6%
Owner-Occupied	*16,066*	*20,234*	*20,183*	*2.9%*	*0.0%*
Renter-Occupied	*13,711*	*12,325*	*15,509*	*-1.3%*	*3.9%*
Vacant	*3,514*	*5,446*	*6,002*	*5.6%*	*1.6%*

Source: Applied Development Economics, based on US Census 2000 SF3 H001, 2000 SF1 DP-1, ACS 2008 B25001 and ACS 2014 B25001. Note: CAGR = compound annual growth rate.

As of Fall 2015, the most-current ACS data for the City of Fairbanks and the City of North Pole cover a five-year period spanning 2009-2013. For each year during the five-year 2009-2013 period, the City of Fairbanks averaged 13,254 housing units, of which, 4,275 were owner-occupied units, resulting in an overall home-ownership rate of 32.2 percent. With 470 owner-occupied units out of a total of 956 units, the City of North Pole exhibits a home-ownership rate of 49.2 percent (Table 8).

TABLE 8
PROFILE OF TOTAL NUMBER OF HOUSING UNITS BY TENURE IN CITY OF FAIRBANKS, CITY OF NORTH POLE, FAIRBANKS NORTH STAR BOROUGH AND ALASKA DURING FIVE-YEAR 2009-2013 PERIOD

JURISDICTION	HOUSING UNITS: 5-YR 2009-2013	*OWNER-OCCUPIED*	*%*	*RENTER-OCCUPIED*	*%*	*VACANT*	*%*
Alaska	306,662	160,803	52.4%	91,096	29.7%	54,763	17.9%
FNSB	41,610	21,082	50.7%	14,506	34.9%	6,022	14.5%
City of Fairbanks	13,254	4,275	32.3%	7,278	54.9%	1,701	12.8%
City of North Pole	956	470	49.2%	384	40.2%	102	10.7%

Source: Applied Development Economics, based on US Census ACS 5-Year 2009-2013 Sample B25048

In the years leading up to the Great Recession, the City of Fairbanks experienced significant increase in new housing units. The number of newly constructed residential units increased by 24 percent a year, going from 28 new units in 2000 to 154 in 2008, and increasing even more to 337 in 2009 (Table 9). Similarly, in the Borough as a whole, the number of newly-built units went up significantly, from 535 in 2000 to 988 in 2007, though the number of newly-constructed units dropped to 537 in 2008. Since 2008 and 2009, the number of new residential units has dropped-off considerably, with 245 new units built in FNSB as a whole in 2014, and just 15 in the City of Fairbanks.

TABLE 9
ANNUAL TRENDS IN NEW RESIDENTIAL STRUCTURES BUILT IN FAIRBANKS NORTH STAR BOROUGH
(2000 - 2014)

YEAR	FAIRBANKS CITY	NORTH POLE	BALANCE	FBSN
08-14 CAGR	**-32%**	**-25%**	**-8%**	**-12%**
00-08 CAGR	**24%**	**18%**	**-4%**	**0%**
2014	15	2	228	245
2013	38	1	254	293
2012	35	5	338	378
2011	50	5	677	732
2010	95	11	423	529
2009	337	2	398	737
2008	154	11	372	537
2007	243	37	708	988
2006	83	39	780	902
2005	82	42	820	944
2004	65	50	858	973
2003	80	10	704	794
2002	50	6	593	649
2001	29	7	562	598
2000	28	3	504	535

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (various years). Note: CAGR = compound annual growth rate.

HOUSING QUALITY

Over the five-year 2009-2013 period, there were on average 35,588 occupied housing units in FNSB each year, according to the ACS. Of these units, slightly over 6 percent lacked complete plumbing facilities (Table 10). For more urbanized areas such as the Cities of Fairbanks and North Pole, the rate at which occupied homes lacked complete plumbing facilities was considerably less. Less than half of one percent of all occupied residential units in the City of Fairbanks lack complete plumbing facilities, while slightly over one percent of all occupied units in North Pole lack plumbing. For the balance of FNSB, slightly over 9 percent of occupied homes lack adequate plumbing, or 2,127 units out of 23,181 units.

TABLE 10
COMPARISON OF UNITS WITH FULL PLUMBING FACILITIES: FNSB, CITY OF FAIRBANKS, CITY OF NORTH POLE, AND ALASKA: 2009-2013 5-YEAR PERIOD

JURISDICTION	TOTAL UNITS FOR WHICH PLUMBING FACILITIES HAS BEEN DETERMINED	COMPLETE PLUMBING FACILITIES		LACKING COMPLETE PLUMBING FACILITIES	
		UNITS	PERCENT	UNITS	PERCENT
Alaska	251,899	240,525	95.5%	11,374	4.5%
FNSB	35,588	33,408	93.9%	2,180	6.1%
City of Fairbanks	11,553	11,510	99.6%	43	0.4%
City of North Pole	854	844	98.8%	10	1.2%

Source: Applied Development Economics, based on US Census ACS 5-Year 2009-2013 Sample B25048

HOUSING DEMAND TRENDS

While the previous section presented findings with regard to housing supply in FNSB, this section focuses on housing demand, and the way in which housing supply and housing demand intersect resulting in certain market prices for various types of homes.

In FNSB, rent for a two-bedroom apartment unit is roughly $1,200 a month, with rent for a three-bedroom apartment unit ranging from $1,500 to $1,600 a month (Table 11). Since the beginning of the Great Recession, 2-bedroom apartment rents have increased annually by almost three percent, going from $1,024 in March 2008 to $1,215 in March 2014. Rents for three-bedroom apartments have remained steady over the same period, declining slightly by -0.5 percent annually, going from $1,662 in March 2008 to $1,609 in March 2014. Rent for a one-bedroom apartment has gone up considerably from 2008 to 2014, having increased by 5.3 percent a year.

Table 11
Trends in Average Monthly Rents by Rental Type For the First Month of Each Quarter: Fairbanks North Star Borough, 2000 - 2014

	Apartments					Homes						
Time	Efficiency	1-BR	2-BR	3+ BR	Apt Avg	1-BR	2-BR	3-BR	4+ BR	Home Avg	Mobile Home	Cabins
'08 MAR – '14 MAR CAGR	**3.4%**	**5.3%**	**2.9%**	**-0.5%**	**2.1%**	**2.0%**	**2.1%**	**1.2%**	**5.0%**	**2.9%**	**3.9%**	**3.7%**
'00 MAR – '08 MAR CAGR	**3.9%**	**4.6%**	**5.3%**	**8.2%**	**6.0%**	**3.1%**	**2.6%**	**4.3%**	**-0.5%**	**2.0%**	**4.2%**	**4.5%**
2014 12 Dec	$700	$939	$1,195	$1,505	$1,085	$1,087	$1,335	$1,699	$1,845	$1,492	-	$697
2014 09 Sept	$847	$933	$1,197	$1,586	$1,141	$912	$1,241	$1,762	$1,912	$1,457	$850	$682
2014 06 June	$717	$935	$1,201	$1,577	$1,108	$970	$1,278	$1,856	$2,155	$1,565	$770	$664
2014 03 March	$700	$1,036	$1,215	$1,609	$1,140	$1,015	$1,291	$1,523	$2,217	$1,512	$1,022	$611
2013 12 Dec	$768	$1,047	$1,234	$1,698	$1,187	$1,011	$1,243	$1,820	$1,951	$1,506	$900	$615
2013 09 Sept	$959	$919	$1,215	$1,698	$1,198	$1,035	$1,390	$1,661	$2,185	$1,568	$858	$635
2013 06 June	$645	$920	$1,181	$1,797	$1,136	$981	$1,369	$1,664	$2,437	$1,613	$625	$520
2013 03 March	$656	$920	$1,190	$1,720	$1,122	$912	$1,185	$1,787	$2,215	$1,525	$1,200	$570
2012 12 Dec	$905	$927	$1,155	$1,861	$1,212	$900	$1,381	$1,650	$2,107	$1,510	-	$571
2012 09 Sept	$951	$908	$1,185	$1,901	$1,236	$950	$1,433	$1,775	$2,140	$1,575	$1,000	$661
2012 06 June	$600	$885	$1,133	$1,462	$1,020	NA	$1,268	$1,664	$1,720	$1,551	$881	$595
2012 03 March	$722	$926	$1,163	$1,454	$1,066	$850	$1,100	$1,586	$2,104	$1,410	$725	$557
2011 12 Dec	$770	$897	$1,100	$1,693	$1,115	$863	$1,141	$1,728	$2,217	$1,487	$866	$599
2011 09 Sept	$833	$906	$1,073	$1,629	$1,110	$969	$1,248	$1,647	$2,233	$1,524	$750	$657
2011 06 June	$723	$901	$1,136	$1,642	$1,101	$1,137	$1,318	$1,632	$2,187	$1,569	$800	$628
2011 03 March	$644	$904	$1,143	$1,571	$1,066	$990	$1,350	$1,481	$2,245	$1,517	$850	$570
2010 12 Dec	$737	$901	$1,102	$1,583	$1,081	$840	$1,319	$1,588	$2,098	$1,461	$925	$608
2010 09 Sept	$842	$901	$1,124	$1,613	$1,120	$950	$1,288	$1,649	$2,101	$1,497	$795	$589
2010 06 June	$685	$874	$1,063	$1,837	$1,115	$1,125	$1,310	$1,606	$1,903	$1,486	$1,300	$535
2010 03 March	$617	$817	$1,028	$1,763	$1,056	$960	$1,489	$1,516	$2,073	$1,510	NA	$562
2009 12 Dec	$760	$867	$1,047	$1,852	$1,132	$1,552	$1,111	$1,555	$2,230	$1,612	$821	$505
2009 09 Sept	$835	$898	$1,078	$1,844	$1,164	$931	$1,138	$1,333	$2,353	$1,439	$824	$527
2009 06 June	$674	$857	$1,018	$1,705	$1,064	$1,254	$1,129	$1,584	$2,227	$1,549	$760	$558
2009 03 March	$678	$862	$1,035	$1,751	$1,082	$1,008	$1,218	$1,476	$2,470	$1,543	$898	$578
2008 12 Dec	$713	$836	$1,023	$1,736	$1,077	$827	$1,038	$1,437	$2,447	$1,437	$866	$563
2008 09 Sept	$741	$849	$1,071	$1,763	$1,106	$890	$1,248	$1,518	$2,314	$1,493	$962	$518
2008 06 June	$620	$791	$1,019	$1,807	$1,059	$922	$1,195	$1,525	$1,837	$1,370	$748	$491
2008 03 March	$574	$759	$1,024	$1,662	$1,005	$900	$1,137	$1,419	$1,650	$1,277	$814	$492
2007 12 Dec	$834	$764	$1,020	$1,684	$1,076	$945	$1,195	$1,503	$1,749	$1,348	$855	$534
2007 09 Sept	$772	$784	$1,019	$1,742	$1,079	$710	$1,282	$1,468	$1,668	$1,282	$865	$577
2007 06 June	$608	$756	$998	$1,791	$1,038	$1,050	$1,220	$1,350	$1,870	$1,373	$975	$541
2007 03 March	$564	$724	$964	$1,464	$929	$883	$1,237	$1,652	$1,458	$1,308	$894	$574
2006 12 Dec	$578	$753	$924	$1,309	$891	$900	$1,102	$1,514	$1,750	$1,317	$800	$525
2006 09 Sept	$596	$713	$935	$1,220	$866	$937	$1,152	$1,498	$1,747	$1,334	$802	$521
2006 06 June	$578	$735	$933	$1,313	$890	$876	$1,149	$1,348	$1,571	$1,236	$778	$574

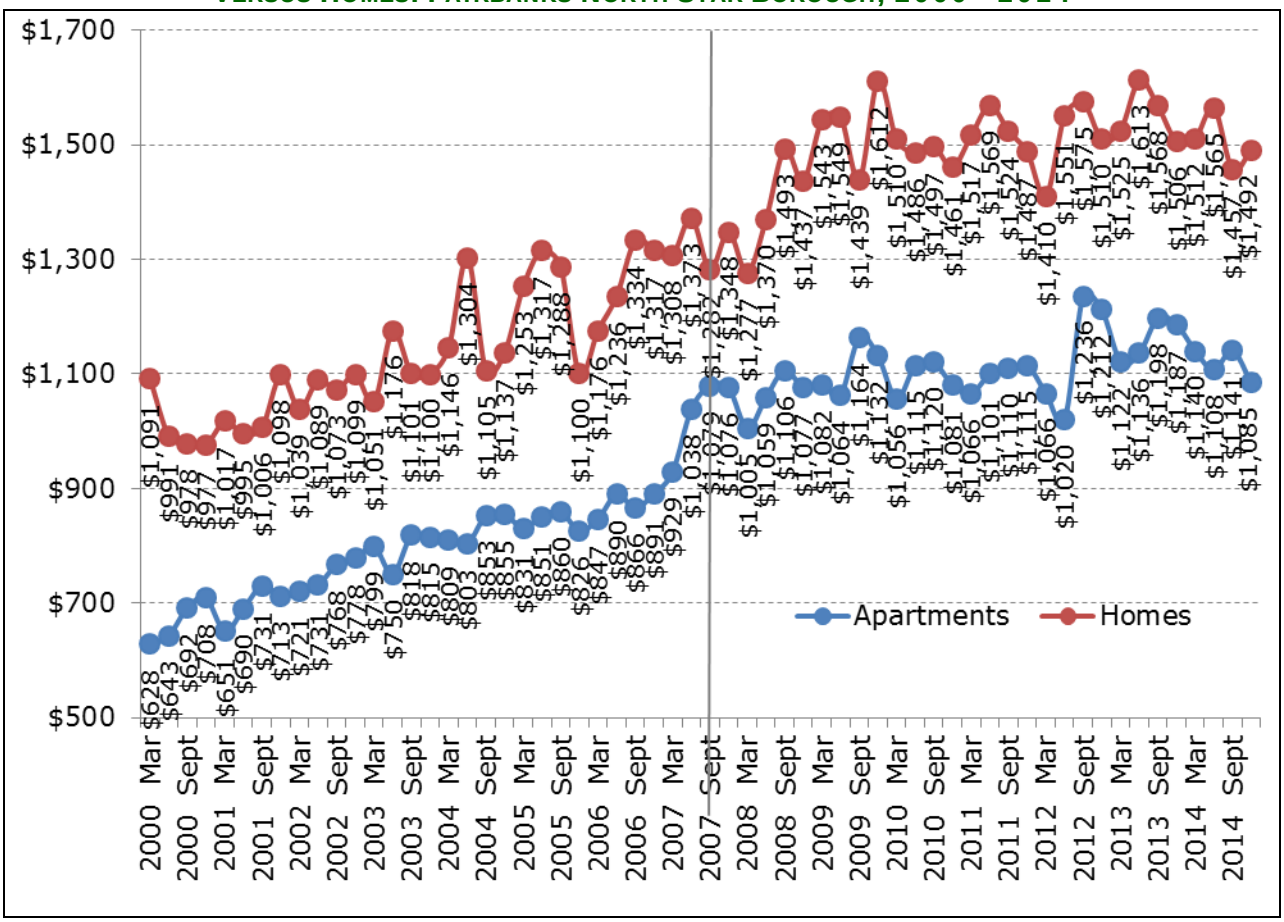
	Apartments					Homes						
Time	Efficiency	1-BR	2-BR	3+ BR	Apt Avg	1-BR	2-BR	3-BR	4+ BR	Home Avg	Mobile Home	Cabins
'08 MAR – '14 MAR CAGR	**3.4%**	**5.3%**	**2.9%**	**-0.5%**	**2.1%**	**2.0%**	**2.1%**	**1.2%**	**5.0%**	**2.9%**	**3.9%**	**3.7%**
'00 MAR – '08 MAR CAGR	**3.9%**	**4.6%**	**5.3%**	**8.2%**	**6.0%**	**3.1%**	**2.6%**	**4.3%**	**-0.5%**	**2.0%**	**4.2%**	**4.5%**
2006 03 March	$580	$757	$887	$1,163	$847	$700	$1,121	$1,556	$1,325	$1,176	$823	$510
2005 12 Dec	$590	$736	$908	$1,070	$826	$775	$975	$1,241	$1,409	$1,100	$780	$498
2005 09 Sept	$518	$754	$889	$1,278	$860	$881	$1,177	$1,468	$1,624	$1,288	$778	$512
2005 06 June	$500	$837	$874	$1,194	$851	$750	$1,213	$1,387	$1,916	$1,317	$794	$513
2005 03 March	$495	$689	$984	$1,157	$831	$750	$1,083	$1,329	$1,850	$1,253	$717	$457
2004 12 Dec	$609	$751	$897	$1,161	$855	$768	$952	$1,404	$1,425	$1,137	$726	$454
2004 09 Sept	$657	$699	$882	$1,174	$853	$730	$1,068	$1,241	$1,380	$1,105	$665	$495
2004 06 June	$497	$669	$893	$1,154	$803	$850	$1,196	$1,441	$1,727	$1,304	$714	$442
2004 03 March	$519	$756	$873	$1,089	$809	$883	$925	$1,363	$1,411	$1,146	$704	$484
2003 12 Dec	$576	$654	$860	$1,170	$815	$718	$1,020	$1,161	$1,500	$1,100	$660	$457
2003 09 Sept	$608	$706	$857	$1,102	$818	$696	$922	$1,229	$1,558	$1,101	$615	$489
2003 06 June	$470	$687	$843	$1,000	$750	$682	$1,161	$1,292	$1,568	$1,176	$662	$419
2003 03 March	$536	$686	$831	$1,143	$799	$706	$875	$1,398	$1,225	$1,051	$832	$464
2002 12 Dec	$542	$683	$832	$1,055	$778	$768	$928	$1,236	$1,462	$1,099	$815	$400
2002 09 Sept	$538	$650	$807	$1,075	$768	$875	$944	$1,081	$1,390	$1,073	$718	$425
2002 06 June	$481	$595	$777	$1,071	$731	$619	$820	$1,218	$1,700	$1,089	$677	$401
2002 03 March	$521	$621	$783	$959	$721	$705	$831	$1,085	$1,533	$1,039	$596	$401
2001 12 Dec	$484	$578	$796	$992	$713	$654	$1,148	$989	$1,600	$1,098	$696	$458
2001 09 Sept	$578	$604	$751	$989	$731	$643	$789	$1,187	$1,405	$1,006	$618	$454
2001 06 June	$490	$560	$723	$985	$690	$705	$882	$1,150	$1,243	$995	$662	$380
2001 03 March	$418	$566	$740	$878	$651	$641	$935	$1,193	$1,300	$1,017	$748	$374
2000 12 Dec	$566	$570	$710	$987	$708	$625	$853	$1,128	$1,300	$977	$755	$397
2000 09 Sept	$506	$578	$725	$960	$692	$600	$836	$1,210	$1,267	$978	$671	$409
2000 06 June	$422	$540	$719	$889	$643	$758	$668	$1,139	$1,400	$991	$687	$380
2000 03 March	$422	$529	$677	$885	$628	$706	$928	$1,015	$1,716	$1,091	$584	$347

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (various years). Note: CAGR = compound annual growth rate.

Compared to apartments, homes for rent in the FNSB tend to exhibit higher rents controlling for product mixes. Whereas two-bedroom apartments rent for $1,200, a two-bedroom home rents for $1,300; while 3-bedroom apartments go for $1,500 to $1,600 a month, three-bedroom homes rent for $1,600 to $1,900. Figure 9 compares average rents for all apartment product types (1-bedroom, 2-bedroom, 3-bedroom, etc.) against rents for all home rental product types, indicating the gap in rental amounts between the two types of units.

FIGURE 9

TRENDS IN AVERAGE MONTHLY RENTS FOR THE FIRST MONTH OF EACH QUARTER: APARTMENTS VERSUS HOMES: FAIRBANKS NORTH STAR BOROUGH, 2000 - 2014



Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (various years).

In 2014, 3-bedroom homes sold for on average $215,997, which is almost the same amount in 2008, or $218,828 (Table 12). Four-bedroom homes sold for, on average, $268,183 in 2014, with five and more bedroom homes going for $314,264. Across all product types, the for-sale price of homes has remained tepid between 2008 and 2014, when home prices grew annually by a slight 0.2 percent. In contrast, between 2000 and 2008, prices increased annually by an average of 6.3 percent.

Table 12
Trends in Annual Average for Sale Price of Homes of Various Sizes: Fairbanks North Star Borough, 2000 - 2014

Year	Nos.	1-BR	Nos.	2-BR	Nos.	3-BR	Nos.	4-BR	Nos.	5+ BR	Tot	Avg
08-14 CAGR	**-2.5%**	**-1.1%**	**0.5%**	**0.4%**	**-0.7%**	**-0.2%**	**3.4%**	**-0.4%**	**11.7%**	**0.3%**	**0.6%**	**0.2%**
00-08 CAGR	**0.0%**	**9.1%**	**-3.5%**	**6.7%**	**2.8%**	**5.7%**	**1.6%**	**6.1%**	**-9.2%**	**6.4%**	**0.7%**	**6.3%**
2014	48	$98,358	140	$160,243	465	$215,997	207	$268,183	46	$314,264	**906**	**$218,062**
2013	44	$109,647	115	$158,175	399	$223,618	138	$290,081	42	$274,467	**738**	**$221,947**
2012	44	$109,099	108	$157,211	343	$227,744	126	$271,471	24	$275,062	**645**	**$218,143**
2011	26	$109,868	104	$165,225	332	$222,347	142	$265,592	35	$281,853	**639**	**$221,939**
2010	59	$115,540	139	$147,941	493	$223,043	198	$266,623	47	$269,378	**936**	**$216,659**
2009	46	$109,055	154	$161,362	465	$224,245	171	$264,285	40	$287,474	**876**	**$217,845**
2008	59	$107,872	135	$155,583	493	$218,826	159	$277,801	19	$306,389	**865**	**$214,151**
2007	58	$107,211	176	$170,842	541	$228,359	194	$271,421	41	$288,301	**1010**	**$222,084**
2006	64	$107,793	158	$148,952	554	$220,860	194	$262,791	46	$288,256	**1016**	**$213,613**
2005	55	$95,452	160	$135,749	439	$207,847	163	$244,873	38	$266,373	**855**	**$196,785**
2004	65	$93,531	164	$120,336	441	$178,733	147	$214,663	39	$240,959	**856**	**$170,080**
2003	59	$74,127	204	$107,667	410	$170,379	173	$204,159	47	$237,134	**893**	**$159,751**
2002	43	$68,595	175	$100,499	295	$158,241	130	$213,208	50	$201,706	**693**	**$151,545**
2001	61	$63,591	233	$94,299	432	$150,035	162	$176,423	47	$188,765	**935**	**$137,025**
2000	59	$53,824	180	$92,473	396	$140,714	140	$173,130	41	$187,028	**816**	**$131,679**

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (various yeears). Note: CAGR = compound annual growth rate.

Current asking prices are higher than the 2014 sales prices, as shown in Table 13. Average listing prices for four and five+ bedroom homes in the City of Fairbanks are $279,677 and $321,704 respectively, whereas for the Borough as a whole, prices for comparable product types are $270,523 and $331,310. For all types of for-sale homes, the average listing for North Pole homes is $210,919, versus $232,805 for homes in the City of Fairbanks, and $221,404 for the Borough as a whole.

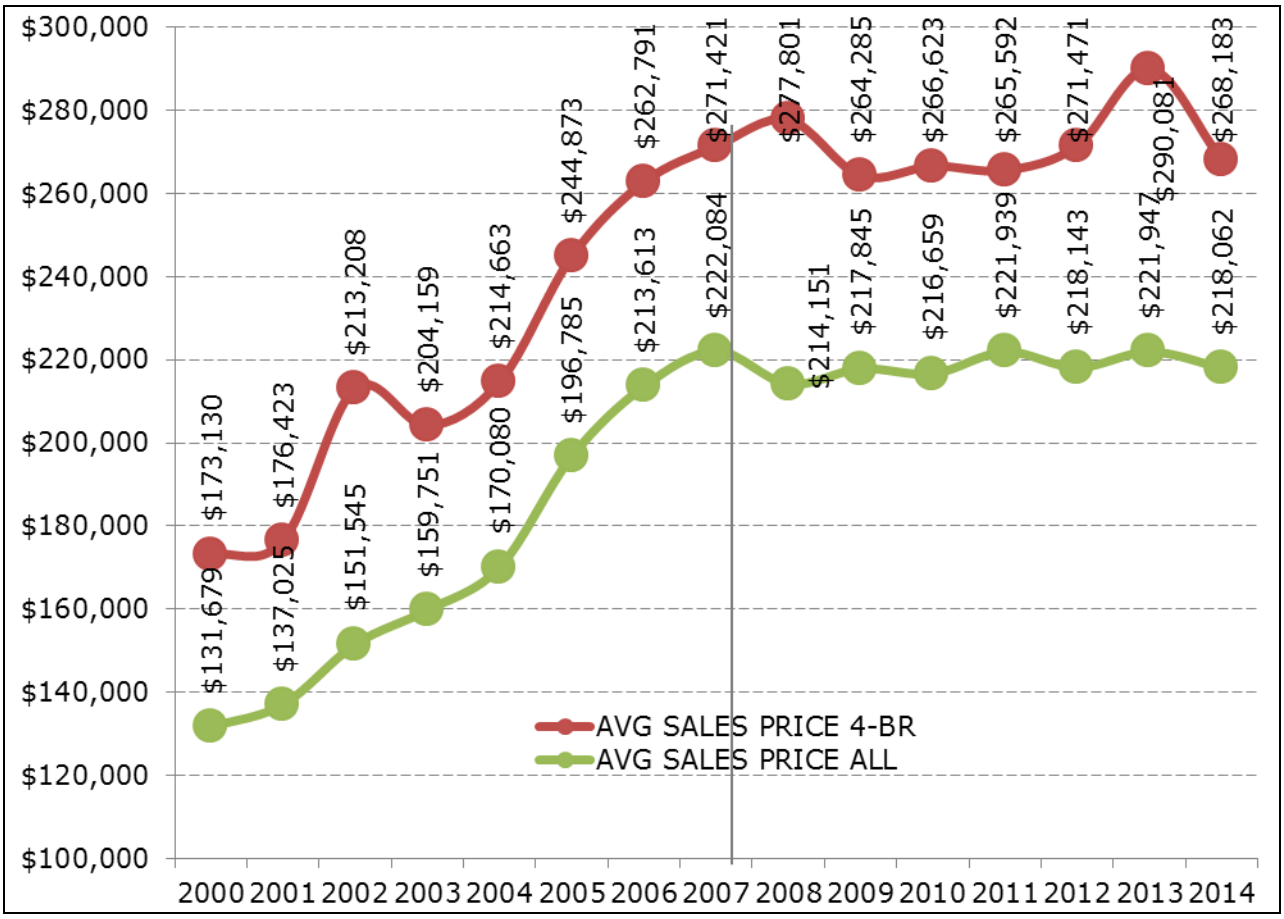
Table 13
Trends in For Sale price of Single-Family Homes: Realtor.com, October 2015

Number of Rooms	Fairbanks	North Pole	Total For FNSB Areas in Realtor.Com*
One Room	$104,208	$123,557	$102,556
Two Rooms	$175,770	$144,525	$162,123
Three Rooms	$254,469	$221,087	$239,910
Four Rooms	$279,677	$246,109	$270,523
Five+ Rooms	$321,704	$368,133	$331,310
All	**$232,805**	**$210,919**	**$221,404**

*Source: Applied Development Economics, based on Realtor.com (*note: As of October 6, Realtor.com has listings for single-family homes on the market in incorporated and unincorporated areas of Fairbanks, Fox, North Pole, Salcha, and Two Rivers).*

The chart below compares average annual sales price of four-bedroom homes against all types of for-sale homes. In 2008, four-bedroom homes in FNSB sold for $277,801. With the onset of the Great Recession, the average price of four-bedroom home dropped to $264,285, where (except for an upward bounce in 2013) it has since remained (Figure 10).

Figure 10
Trends in Annual Average For Sale Price of Homes of Various Sizes: Fairbanks North Star Borough, 2000 - 2014



Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (various yeears). Note: CAGR = compound annual growth rate.

In addition to housing supply and demand, housing affordability has important implications for economic development. High housing prices relative to household incomes affect the quality of life for workers and their families. The standard threshold for housing affordability is 30 percent of income. Households spending less than 30 percent of their monthly income on monthly gross rent (i.e. including utilities) or on their monthly mortgage live in affordable situations, while those spending 30 percent or more live in unaffordable situations.

The bulk of homeowners live in affordable situations. For the Borough as a whole, 74.1 percent of all home owners spend less than 30 percent of their income toward housing (or 15,592 out of 21,038). In the Cities of Fairbanks and North Pole, almost two-thirds of all home owners reside in affordable

situations. In stark contrast, over half of all renters in the Borough and the City of Fairbanks spend more than 30 percent of income on rent, with 45 percent of all renters in the City of North Pole also residing in unaffordable situations.

Table 14
Trends in Households Paying Above or Below Affordable Housing Ratio of 30 percent of Income on Housing

	Alaska		FNSB		City of Fairbanks		City of North Pole	
Households	Nos.	Per.	Nos.	Per.	Nos.	Per.	Nos.	Per.
Total	251,899		35,588		11,553		854	
Owner-Occupied Households	160,482		21,038		4,249		468	
< 30 Per. of Hsng Payment to Income Ratio	*120,301*	*47.8%*	*15,592*	*43.8%*	*2,726*	*23.6%*	*302*	*35.4%*
30+ Per. of Hsng Payment to Income Ratio	*40,181*	*16.0%*	*5,446*	*15.3%*	*1,523*	*13.2%*	*166*	*19.4%*
Renting Households	82,832		13,478		6,911		367	
< 30 Per. of Hsng Payment to Income Ratio	*45,875*	*18.2%*	*6,561*	*18.4%*	*3,081*	*26.7%*	*200*	*23.4%*
30+ Per. of Hsng Payment to Income Ratio	*36,957*	*14.7%*	*6,917*	*19.4%*	*3,830*	*33.2%*	*167*	*19.6%*
Other Status, incl. non-cash rent	8,585	3.4%	1,072	3.0%	393	3.4%	19	2.2%

Source: Applied Development Economics, based on US Census ACS 5-Year Sample B25106

SUMMARY OF HOUSING NEEDS ASSESSMENT PERTAINING TO BASING OF F-35A SQUADRONS AT EIELSON AIR FORCE BASE

In September 2015, the Fairbanks Economic Development Corporation and Winters & Associates released a housing needs assessment for the FNSB, particularly to gauge the adequacy of the housing stock to provide for the number of new persons who will come to the FNSB as a result of the much-anticipated potential basing of two squadrons of F-35As at Eielson Air Force Base.[8] As indicated in the report, the new economic activity comes at a time when the FNSB is experiencing the highest vacancy rates in the State of Alaska. The following are a few of the key findings from the analysis, particularly with respect to the adequacy of the housing supply relative to housing demand stemming from any increase in personnel at Eielson due to basing of the F-35As:

- Basing the F-35s at Eielson is expected to add 1,563 military and civilian personnel (and their jobs) to the base by FY 2020. With the addition of 1,202 military dependents, the base population will increase by an estimated 2,765 individuals, or grow by 49 percent. FNSB population would increase by 2.7 percent.
- The Air Force anticipates 314 families will be looking for off base housing.
- Mapping housing vacancies within various driving time from Eielson AFB shows an adequate number of vacancies in the 10 and 20 minute driving time from the base. However, almost all

[8] Winters & Associates, "Fairbanks North Star Borough Housing Needs Assessment". Vol. September 2015. Fairbanks, Alaska: Fairbanks Economic Development Corporation, 2015. 50.

vacancies would be filled and it is unlikely suitable housing by unit size and type will meet all needs.

- The FNSB may need additional housing for military families living off base because of the narrower geographic area of acceptable housing.
- The creation of new jobs as a result of military construction and the on-going maintenance and operations of the F-35s may lead to population increases outside of the projected normal growth (1 percent) and the 2.7 percent growth from the influx of people to Eielson.
- Existing housing stock will most likely be adequate for the population increase resulting from the direct, indirect, and induced jobs.

PHYSICAL INFRASTRUCTURE PROFILE

This section of the CEDS update includes information on trends with regard to the FNSB's physical infrastructure. In some instances, in addition to updating data in the 2011 report, new information is provided so as to shed further light on trends with regard to the Borough's physical infrastructure.

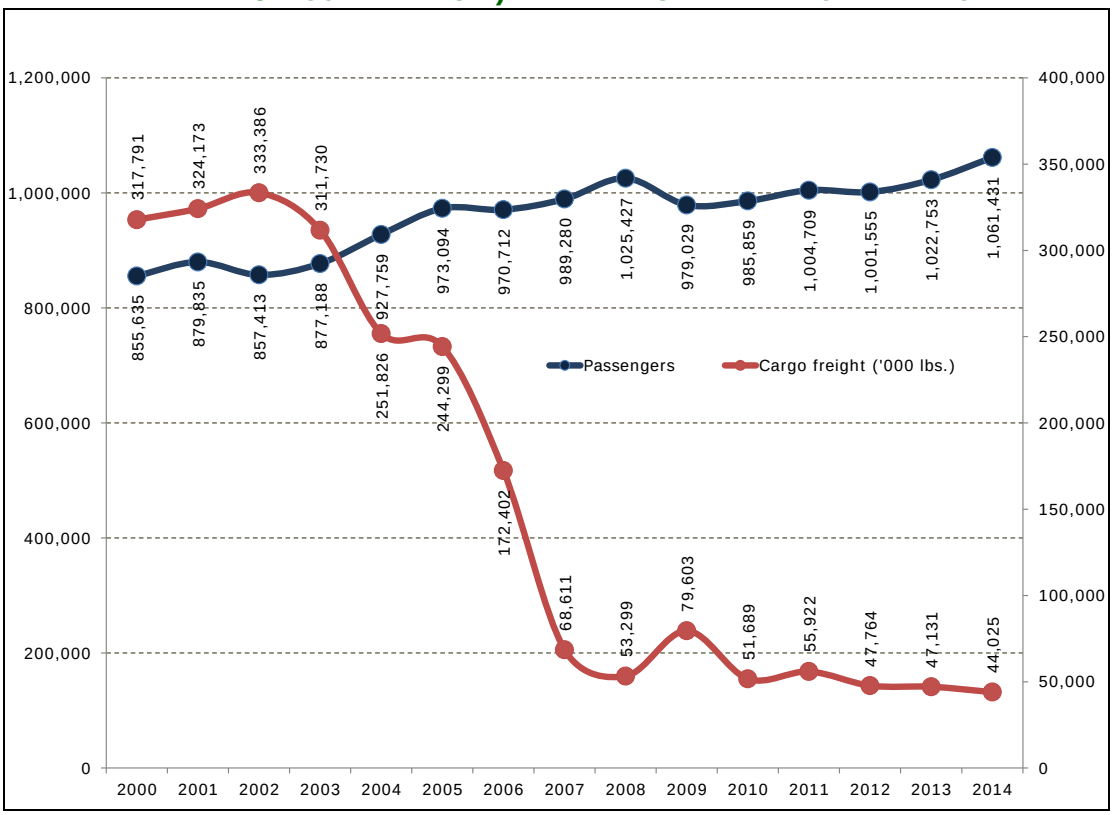
AIR TRANSPORTATION

Due to its geographic isolation from the other 49 states of the United States of America and remoteness from many nations other than Canada, as well as limited availability of other sources of transportation due to climate, FNSB in particular and Alaska in general rely heavily on air transportation. International and domestic air cargo and passenger service are the main components of air transportation's role in the FNSB's economy, particularly with regard to bringing tourists from other parts of the nation and from abroad. In terms of air cargo, the Fairbanks International Airport (FAI) is strategically located by serving as a refueling stop for international air cargo flights. Domestically, the FAI serves as a hub for many communities in Interior and Northern Alaska, many of which utilize air transit to get to more urbanized areas to access health and other services. Mail is delivered to many in rural and remote communities via planes departing from and returning to FAI.

Fairbanks International Airport reports that total passenger volumes surpass levels prior to the full on-set of the Great Recession, which began in earnest in 2008 and continued well into 2010. In 2008, FAI reported 1,025,427 total passengers, which then dropped to 979,029 in 2009, and then recovered slightly to 985,859 in 2010. In 2013, passenger levels almost returned to 2008 levels, reaching 1,022,753 total passengers. In 2014, FAI reported 1,061,431 total passengers. While passenger levels now surpass those prior to the Great Recession, it is important to note that the number of total passengers increased annually by 2.3 percent between 2000 and 2008, while between 2008 and 2014, the number increased by 0.6 percent annually. In other words, passenger numbers have stabilized to pre-recession levels but are not now growing at pre-recession levels.

FIGURE 11

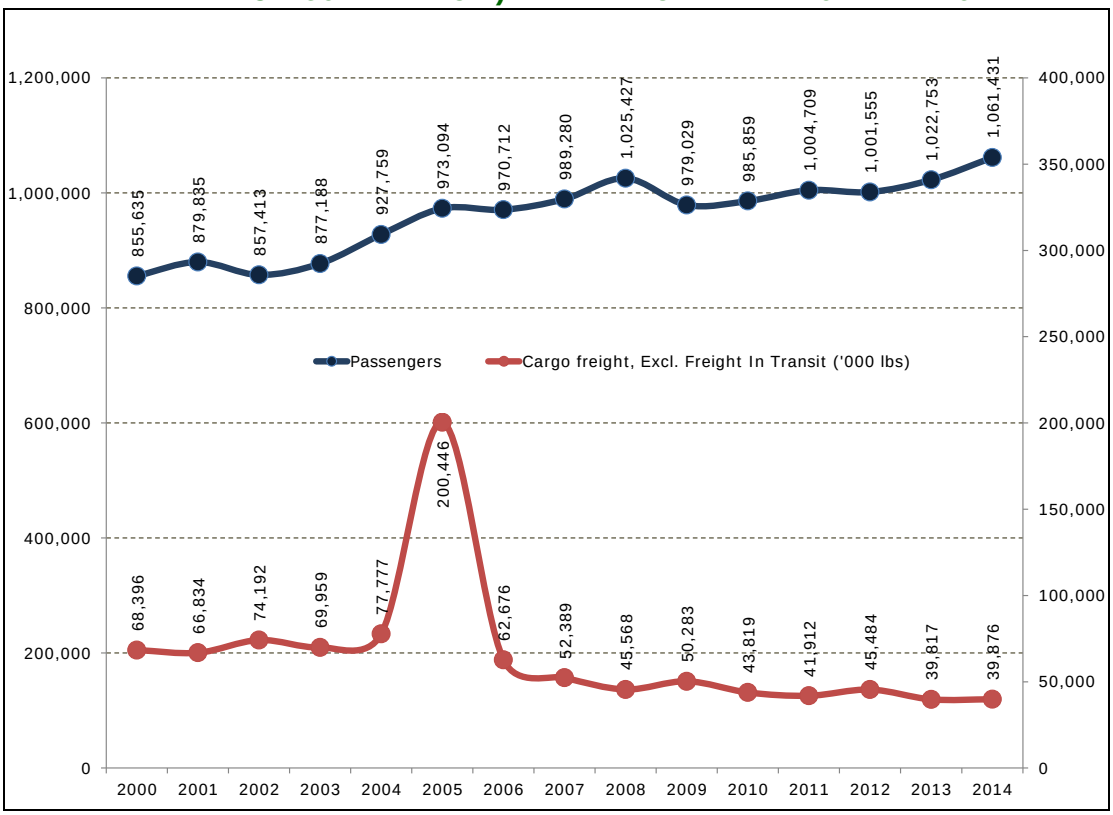
ANNUAL TRENDS IN TOTAL NUMBER OF PASSENGERS AND TOTAL VOLUME OF CARGO (INCLUDING CARGO IN TRANSIT): FAIRBANKS INTERNATIONAL AIRPORT



While passenger levels have returned to pre-recession levels, the volume of cargo has not returned to pre-recession levels, although the drop-off in cargo volume began in earnest prior to the on-set of the Great Recession and as early as 2003. In 2002, FAI handled 311,730,000 pounds of cargo, which then declined to 251,825,000 pounds in 2003 and slid even more to 172,402,000 pounds in 2006, going down to a level in 2008 (i.e. 53,299,000 pounds) that FAI has for the most part never recovered from. The downward slide in air cargo is attributable to the decline in airlines carrying cargo through FAI but not dropping the cargo off at FAI. The volume of air cargo picked-up and dropped-off at FAI has remained steady in a somewhat downward manner. In 2008, 45,568,000 pounds of cargo were picked-up or dropped-off at FAI; in 2014, FAI dealt with 39,875,000 pounds of cargo.

FIGURE 12

ANNUAL TRENDS IN TOTAL NUMBER OF PASSENGERS AND TOTAL VOLUME OF CARGO (EXCLUDING CARGO IN TRANSIT): FAIRBANKS INTERNATIONAL AIRPORT



ALASKA RAIL ROAD CORPORATION

The State of Alaska acquired the Alaska Rail Road Corporation (ARRC) from the federal government in 1985. Since then, the ARRC has operated as an independently managed corporation, meaning that the ARRC receives no operating funds from the state, nor are its employee's state employees. Rather, the corporation generates revenue through freight, passenger and real estate services to cover personnel, operations and maintenance expenses. (The state does cover some maintenance and construction costs)

ARRC provides both passenger and freight service to the FNSB. Passenger service is primarily a summer operation serving the visitor industry. Total ARRC passenger volume increased in a steady fashion from 2000 to 2008, going from 499,481 passengers to 542,671, for an annual increase of one percent a year. From 2008 to 2014, the total number of passengers declined annually by 2.4 percent, from 542,671 to 468,661. In the intervening years between 2008 and 2014, total passenger volumes never surpassed the 2008 level. Of the number of ARRC passengers gong to and from Fairbanks, roughly 25 percent to 30 percent of all passengers reach Fairbanks, which is the northern-most terminus of the 470 mile ARRC rail line that stretches from Fairbanks to the all-season, deep-water port town of Seward.

Table 15

ANNUAL TRENDS IN ALASKA RAIL ROAD PASSENGERS AND PETROLEUM RAIL CARS (ALL STOPS, INCLUDING FAIRBANKS)

YEAR	PASSENGERS	BULK PETROLEUM RAIL TONNAGE
08-14 CAGR	-2.4%	-19%
00-08 CAGR	1.0%	-2%
2014	468,661	580
2013	489,682	947
2012	415,490	1,057
2011	412,209	1,292
2010	405,135	1,254
2009	470,786	1,657
2008	542,671	1,910
2007	564,800	2,230
2006	525,293	2,068
2005	461,118	2,555
2004	485,544	2,653
2003	439,271	2,722
2002	463,122	2,339
2001	465,626	2,372
2000	499,481	2,257

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly Spring 2002, 2008, and 2015. Note: CAGR = compound annual growth rate.

The ARRC also handles rail lines dedicated to moving goods and cargo. Coal is transported from the Usibelli Coal Mine, in Healy, Alaska to power generation plants in Fairbanks, Fort Wainwright Army Base and Eielson Air Force Base. In the past, the ARRC transported jet fuel from North Pole refineries to Anchorage International Airport, although, with the closure of the Flint Hills Refinery in 2012, it no longer does so. It is worth noting that prior to the on-set of the Great Recession, the volume of oil transferred along the ARRC line had declined annually by two percent, from 2,257 tons in 2000 to 1,910 tons in 2008. The volume of oil by rail cars declined even more since 2008, dropping down to 580 tons in 2014. In large part, this is due to the recent closure of one of two refineries in FNSB.

HIGHWAYS, ROAD AND TRAIL SYSTEMS

The Alaska Highway connects Fairbanks to Canada and the Continental U.S. The Alaska Highway terminates at Delta Junction where it meets the Richardson Highway, which continues on to Fairbanks. The Richardson Highway, a historic trail used during the gold rush, connects Fairbanks with Valdez. The Parks Highway extends 300 miles south from Fairbanks to Wasilla where it connects with the Glenn Highway to Anchorage and Glennallen. The George Parks Highway was constructed in the late 1960s to shorten road travel time between Fairbanks and Anchorage. It also provides access to Denali National Park, and Mount McKinley or Denali (Koyukon Athabaskan for "The High One") the highest mountain peak in North America and the United States, with a summit elevation of 20,320 feet (6,194 m) above sea level, the State's top tourist attraction. The Steese Highway leads north to Circle and the Yukon River. North of Fairbanks, the Chena Hot Springs Road branches east from the Steese Highway. The junction of the Elliott and Steese Highways is at Fox, north of Fairbanks. The Elliott Highway extends west to Livengood, Minto and Manley Hot Springs. The Dalton Highway begins just

north of Livengood and continues north to the Prudhoe Bay oil fields. During the winter months, ice roads and winter trails traveled by truck, snow machine and dog sled connect rural communities inaccessible by road or highway. [9]

TABLE 16
TRENDS IN NUMBER OF REGISTERED VEHICLES BY TYPE:
FAIRBANKS NORTH STAR BOROUGH (2000-2014)

PERIOD	TOTAL	PASSENGER	MOTOR-CYCLE	COMM. TRAILER	TRAILER	COMM. TRUCK	PICK UP	BUS	SNOW MOBILE
08-14 CAGR	**1.9%**	2.4%	2.0%	-3.3%	1.7%	1.4%	2.5%	1.3%	-1.7%
00-08 CAGR	**2.7%**	1.9%	7.1%	-1.9%	2.9%	1.5%	2.5%	1.4%	7.4%
2014	**153,333**	68,804	5,525	1,318	20,886	7,976	37,041	503	11,280
2013	**153,493**	68,762	5,548	1,489	20,904	7,963	36,912	495	11,420
2012	**152,356**	68,213	5,565	1,410	20,765	8,206	36,255	478	11,464
2011	**149,736**	67,004	5,352	1,490	20,507	8,136	35,236	465	11,546
2010	**144,478**	64,222	5,218	1,409	19,949	7,560	33,941	463	11,716
2009	**137,998**	60,297	5,057	1,397	19,389	7,197	32,042	422	12,197
2008	**137,341**	59,787	4,905	1,608	18,846	7,341	31,896	465	12,493
2007	**136,979**	59,217	4,473	1,665	18,793	7,114	32,318	523	12,876
2006	**134,278**	58,213	4,115	1,711	18,098	7,116	31,901	560	12,564
2005	**132,877**	58,142	3,874	1,463	18,080	6,750	31,593	474	12,501
2004	**130,132**	58,007	3,661	1,416	17,608	6,467	30,699	479	11,795
2003	**122,045**	54,998	3,376	1,439	17,084	6,053	29,385	482	9,228
2002	**117,823**	53,552	3,190	1,538	16,044	6,206	28,066	448	8,779
2001	**113,440**	51,636	2,944	1,433	15,592	6,075	26,708	451	8,601
2000	**111,263**	51,498	2,824	1,874	14,967	6,524	26,089	417	7,070

Source: ADE, Inc., based on State of Alaska Division of Motor

State and Borough road and trail networks have been receiving an increasing amount of use. According to the State of Alaska Division of Motor Vehicles, there were 153,333 motor vehicles registered in the FNSB in 2014, up 1.9 percent a year over the 2008 figure of 137,341. While all motor vehicles increased by 1.9 percent, in a sign of economic recovery, the number of passenger vehicles increased annually by 2.4 percent from 2008 to 2014, going from 59,787 to 68,804. Pick-up trucks also increased at a rate faster than the overall 1.9 annual clip for the 2008-2014 period, at 2.5 percent a year. Interestingly, the rate at which pick-up trucks increased prior to 2008 (2.5 percent a year) was the same as the rate at which they increased annually since 2008, underscoring the necessity of such a vehicle in the FNSB and Alaskan terrain.

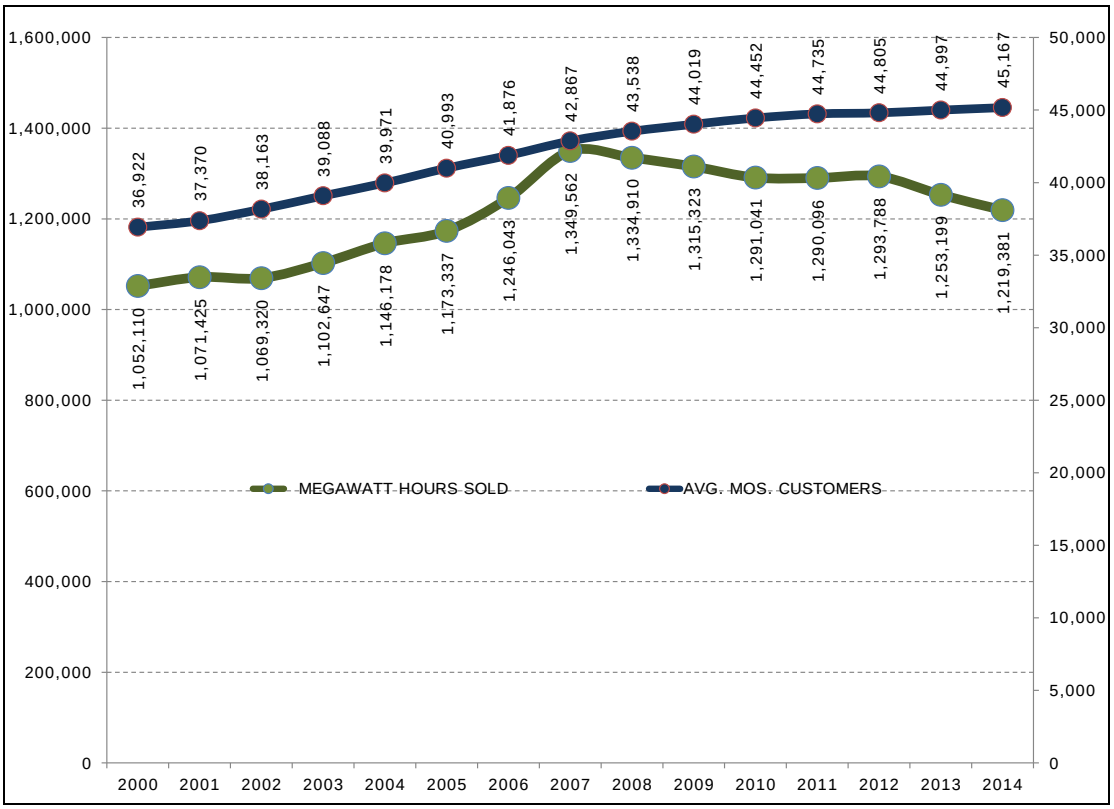
[9] FNSB, "2011: Comprehensive Economic Development Strategy", page 24

ELECTRIC UTILITIES

Incorporated in 1946 in Fairbanks, Alaska, Golden Valley Electric Association (GVEA) distributes power to service locations in Fairbanks, Delta, Nenana, Healy and Cantwell over 3,099 miles of transmission and distribution lines and 35 substations. Golden Valley's fuel mix is changing. In addition to their diverse fuel supply of coal, oil, natural gas and hydroelectric power, GVEA is adding more renewable power. Launched in 2005, the Sustainable Natural Alternative Power program - SNAP - now has 39 local renewable energy producers. GVEA also owns and operates the Eva Creek 10M wind farm outside Healy. Over the last decade, kilowatt-hour purchases more than doubled as the number of large commercial customers increased. [10]

FIGURE 13

ANNUAL TRENDS IN MEGAWATT HOURS SOLD VERSUS AVERAGE NUMBER OF MONTHLY RESIDENTIAL AND COMMERCIAL CUSTOMERS: GVEA



In 2014, GVEA averaged 45,167 monthly customers, up slightly from the monthly average in 2008, or 43,558, for an annual increase of 0.6 percent. In comparison, the average monthly customers increased annually by 2.1 percent from 2000 to 2008, going from 36,922 to 43,538. Of the 45,167 customers, the bulk is residential, at 38,287. It is also important to note that the change in average monthly large commercial/industrial customers of 449 in 2008 to 46 in 2014 was due most likely to a change in how certain users were categorized, not due to the outright closure of 400 large commercial/industrial customers.

[10] FNSB, "2011: Comprehensive Economic Development Strategy", page 26

TABLE 17
ANNUAL TRENDS IN AVERAGE NUMBER OF MONTHLY CUSTOMERS, MEGAWATT HOURS SOLD, AND REVENUES
GOLDEN VALLEY ELECTRIC ASSOCIATION

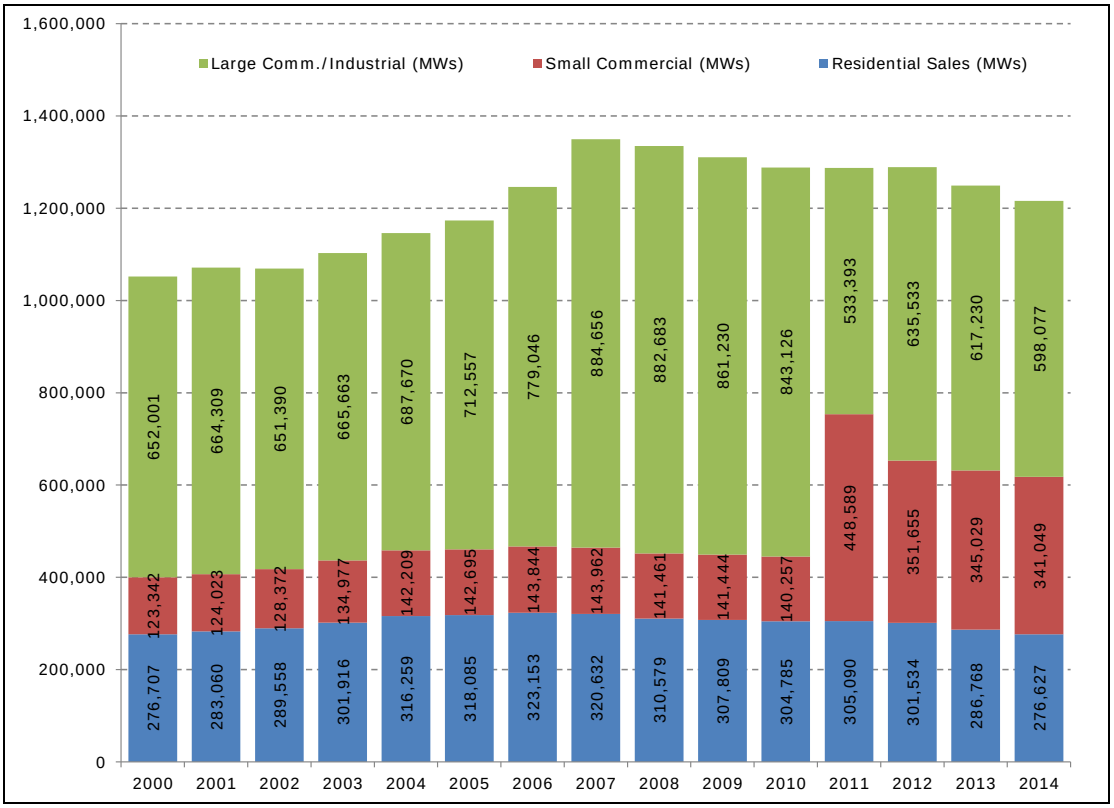
	2000	2008	2014	00-08 CAGR	08-14 CAGR
AVG. MOS. CUSTOMERS	**36,922**	**43,538**	**45,167**	**2.1%**	**0.6%**
Residential Sales	31,271	36,860	38,287	2.1%	0.6%
Small Commercial	5,233	6,229	6,711	2.2%	1.2%
Large Commercial/Industrial	418	449	46	0.9%	-31.6%
Other			123		
MEGAWATT HOURS SOLD	**1,052,110**	**1,334,910**	**1,219,381**	**3.0%**	**-1.5%**
Residential Sales (MWs)	276,707	310,579	276,627	1.5%	-1.9%
Small Commercial (MWs)	123,342	141,461	341,049	1.7%	15.8%
Large Comm./Industrial (MWs)	652,001	882,683	598,077	3.9%	-6.3%
Other	60	187	3,628	15.3%	63.9%
SALES REVENUES	**$83,159,837**	**$212,233,448**	**$229,755,081**	**12.4%**	**1.3%**
Residential Sales ($)	$26,604,699	$57,380,373	$63,436,103	10.1%	1.7%
Small Commercial ($)	$12,780,709	$24,640,094	$67,459,637	8.6%	18.3%
Large Comm./Industrial ($)	$43,773,212	$130,197,304	$98,108,552	14.6%	-4.6%
Other ($)	$1,217	$15,677	$750,789	37.6%	90.6%

Source: Applied Development Economics, based on GVEA Annual Reports

While the average number of customers increased slightly from 2008 to 2014 by 0.6 percent a year, the amount of megawatt hours sold had decreased over the same period by 1.5 percent a year, going down to a total of 1,219,381 megawatt hours sold in 2014. In contrast, from 2000 to 2008, the amount of megawatt hours sold increased annually by three percent, from a total of 1,052,110 megawatt hours to 1,334,910 megawatt hours.

FIGURE 14

ANNUAL TRENDS IN MEGAWATT HOURS SOLD BY TYPE OF CUSTOMER: GVEA



The University of Alaska Fairbanks, Fort Wainwright Army Base, and Eielson Air Force Base have their own electrical generating facilities. All electrical providers are linked to an intertie system that can provide back-up power in the event of a power outage or other emergency. Some of these providers also sell surplus power to one another on a common power intertie that links Anchorage and South central Alaska to Fairbanks.

TELECOMMUNICATIONS INFRASTRUCTURE

The FNSB serves as a hub for telecommunications services to Interior and Northern Regions of Alaska. With regard to cable service, Fairbanks is connected to Alaska's fiber optic cable system that runs from Prudhoe Bay to Anchorage. Alaska is connected to the Continental U.S. by four fiber optic cables. With regard to phone service, there are a number of competing companies providing interstate and intrastate long distance for the Interior. These firms are Verizon, AT&T, Alaska Communication (ACS), GCI, and Cellular One. Many of these firms provide both wireless network service and Internet access.[11]

To provide an order of magnitude view of how many phone customers there are in the FNSB, according to data culled by the FNSB Community Research Center, ACS and GCI had 30,005 monthly residential telephone customers in 2013, which is below their combined pre-recession 2008 total of

[11] FNSB, "2011: Comprehensive Economic Development Strategy", page 27

41,820. While the number of residential customers increased by 1.5 percent a year between 2000 and 2008 (from 37,055 to 41,820), since 2008, the number of residential customers dropped by 6.4 percent a year. This may be due to service providers operating in the FNSB who are not included in the Community Research Center's inventory, as well as to the possibility that customers are transitioning away from land lines for cellular service.

TABLE 18
TRENDS IN NUMBER OF TELEPHONE GCI AND ACS CUSTOMERS BY TYPE OF SERVICE

PERIOD	RESIDENTIAL	COMMERCIAL
08-13 CAGR	-6.4%	-0.2%
00-08 CAGR	1.5%	1.9%
2013	30,005	20,033
2012	38,211	19,907
2011	44,677	20,133
2010	50,371	19,713
2009	49,753	20,793
2008	41,820	20,269
2007	40,600	19,668
2006	39,107	17,734
2005	36,777	17,170
2004	36,271	17,248
2003	35,907	17,187
2002	36,006	20,113
2001	37,632	21,566
2000	37,055	17,437

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly, Spring 2015 page 43

Alaskans and residents of the Interior and Northern regions especially rely extensively upon wireless networks and satellite-based telecommunications services. Given the geographic isolation of many of these communities, many services provided in the FNSB, such as postsecondary educational courses, are extended to outlying communities via these telecommunication networks. There are 134 FCC-approved cell phone towers in FNSB. Of the 134, 107 have been constructed, with 27 receiving approvals but not yet constructed. Over half of all constructed cell towers are between 25 to 49 feet high, or 58 out of 107. Alaskans are also served by a network of microwave relay towers to deliver phone and data service to rural communities. The State of Alaska's Department of Administration Network Services manages the statewide technology backbone providing digital connectivity for voice, data and video transmission. A portion of this backbone is a system of copper, fiber and point-to-point microwave communications, the State of Alaska Telecommunications System (SATS). It connects over

two hundred sites primarily located along the main road systems from Fairbanks to Kodiak and Cordova. Within and between the major cities and rural communities, SATS carries a variety of customer traffic including all voice, data and video traffic between Anchorage and Fairbanks.

TABLE 19
NUMBER OF APPROVED CELL PHONE TOWERS
IN FAIRBANKS NORTH STAR BOROUGH

	TOTAL APPROVED	APPROVED AND CONSTRUCTED	APPROVED NOT YET CONSTRUCTED
01 up to 25 feet	**21**	18	3
02 25 to 49 feet	**76**	58	18
03 50 to 99 feet	**33**	28	5
04 100 feet and higher	**4**	3	1

Source: Applied Development Economics, based on FCC

WATER TREATMENT AND DISTRIBUTION

The water distribution system in the FNSB consists of systems operated by Golden Heart Utilities (GHU), College Utilities Corporation (CUC), Fort Wainwright, Valley Water, the University of Alaska Fairbanks, and the City of North Pole. GHU has 150 miles of water mains, 17 pumping stations, 1500 fire hydrants servicing 30,000 residents and over 1,100 businesses. CUC distributes over 300 million gallons of water annually through 74 miles of water main, serving over 10,000 residents and 225 businesses. In addition to the 74 miles of main, CUC operates 9 pumping stations and 538 fire hydrants. Water treatment is provided to GHU and CUC from GHU's Water Treatment plant. Each year the plant produces and distributes over 1.2 billion gallons of water. Fort Wainwright, Valley Water, the University of Alaska Fairbanks, and the City of North Pole have their own water systems. [12]

[12] FNSB, "2011: Comprehensive Economic Development Strategy", page 27

TABLE 20
TRENDS IN NUMBER OF RESIDENTIAL AND COMMERCIAL WATER UTILITIES CUSTOMERS IN FAIRBANKS NORTH STAR BOROUGH

		Residential				Commercial			
Period	Total	Sub-Total	CUC	GHU	North Pole	Sub-Total	CUC	GHU	North Pole
08-14	**0.4%**	0.5%	0.8%	0.4%	0.8%	-0.1%	1.2%	-0.5%	1.5%
00-08	**1.4%**	1.4%	1.9%	0.8%	8.6%	1.2%	3.5%	1.3%	-4.3%
2014	**9,477**	8,035	2,087	5,449	499	1,442	243	1,107	92
2013	**9,483**	8,027	2,035	5,408	584	1,456	241	1,117	98
2012	**9,456**	7,994	2,028	5,382	584	1,462	241	1,123	98
2011	**9,405**	7,926	2,006	5,344	576	1,479	237	1,142	100
2010	**9,292**	7,833	2,000	5,356	477	1,459	229	1,144	86
2009	**9,262**	7,821	1,990	5,354	477	1,441	228	1,127	86
2008	**9,231**	7,778	1,984	5,317	477	1,453	226	1,143	84
2007	**9,166**	7,722	1,952	5,296	474	1,444	219	1,127	98
2006	**9,081**	7,603	1,875	5,277	451	1,478	209	1,116	153
2005	**8,748**	7,406	1,875	5,228	303	1,342	198	1,002	142
2004	**8,614**	7,284	1,823	5,172	289	1,330	203	989	138
2003	**8,543**	7,142	1,782	5,128	232	1,401	196	1,077	128
2002	**8,424**	7,058	1,752	5,077	229	1,366	179	1,059	128
2001	**8,335**	7,005	1,722	5,025	258	1,330	173	1,041	116
2000	**8,263**	6,945	1,708	4,990	247	1,318	172	1,027	119

Source: ADE, Inc., based on FNSB Community Research Center, Community Research Quarterly Spring 2015, and GHU and CUC annual reports (note: using corporate annual reports, ADE adjusted CRQ data to move multi-family to residential, not commercial)

Of the 99,357 persons residing in FNSB, 60,000 are served by GHU, CUC, and the City of North Pole.[13] These water providers have, on average, 8,035 monthly residential water customers, of which 5,449 are serviced by GHU, 2,087 by CUC, and 499 by the City of North Pole.[14] The number of residential water customers for these three providers increased by 0.5 percent a year from 2008 to 2014, going from 7,778 to 8,035. The number of commercial water customers for these three providers remained similarly steady over the same period, declining slightly by 0.1 percent a year from 2008 to 2014, going from 1,453 to 1,442. In contrast, the number of residential customers increased by 1.4 percent a year prior to the Great Recession, going from 6,945 in 2000 to 7,778 in 2008. Commercial customers increased annually by 1.2 percent over the same period.

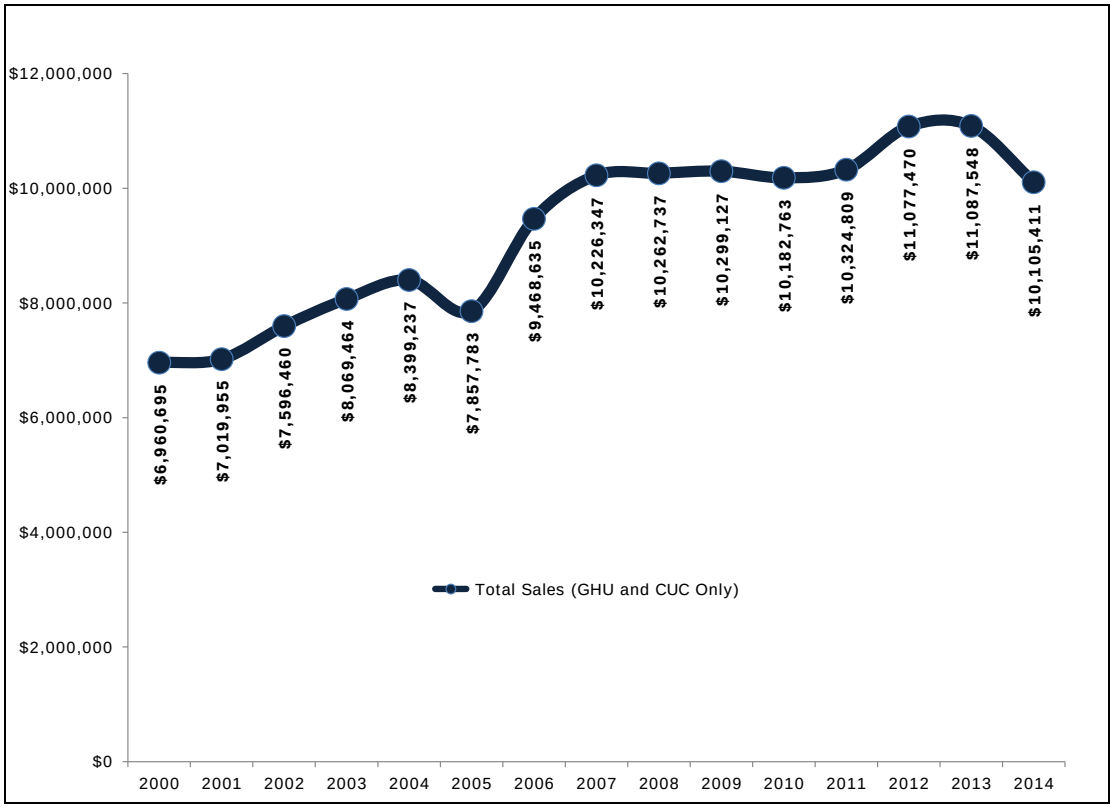
[13] Utility Services of Alaska, Inc. "Company Bio" http://bit.ly/1W0cchj

[14] While there are an estimated 34,056 occupied housing units in the FNSB per US Census ACS 2013 1-Year sample, a number of these units are in multi-family buildings with single meters.

While the combined number of GHU and CUC residential and commercial customers increased between 2013 and 2014, total water sales for these two utilities ranged from $11,087,548 to $10,105,411. While total sales dropped-off recently, since 2007, total water sales for these two entities have generally hovered around $10.1 million and $10.3 million, with upward spikes to $11.1 million in both 2012 and 2013.

FIGURE 15

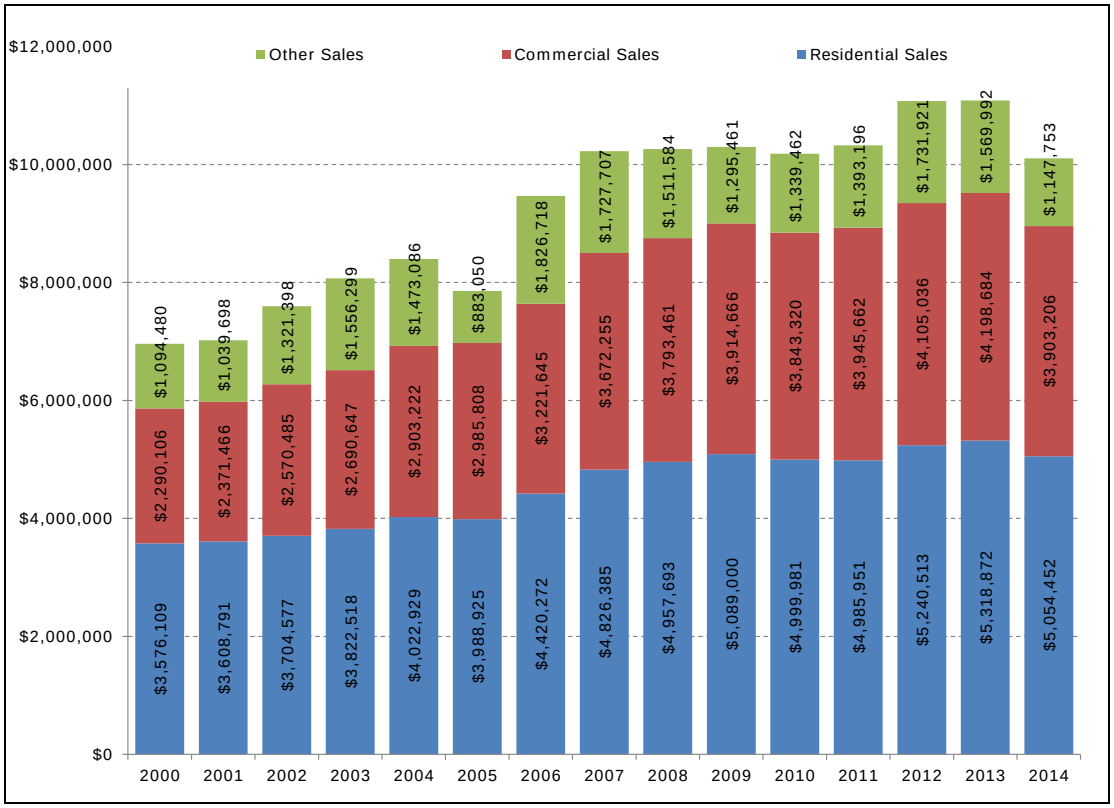
ANNUAL TRENDS IN REVENUES GENERATED BY SALES OF WATER: GHU AND CUC ONLY



Sales to residential water users have historically generated the largest share of total revenues for GHU and CUC, though commercial users are not far behind. In 2014, of the $10,105,411 in sales, $5,054,452 was from residential users and $3,903,206 from commercial users.

FIGURE 16

ANNUAL TRENDS IN REVENUES GENERATED BY WATER SALES BY TYPE OF CUSTOMER: GHU AND CUC ONLY



WASTEWATER TREATMENT AND DISTRIBUTION

Wastewater treatment is provided by the City of North Pole, CUC, and Golden Heart Utilities (GHU). GHU operates the Regional treatment facility processing 1.7 billion gallons of wastewater. GHU has 60 lift stations and 115 miles of wastewater collections mains, while CUC has 31 lift stations and 51 miles of wastewater collections mains. Much of the FNSB's population is not serviced by water or wastewater utilities. Many Borough residents rely upon private wells, septic systems or water delivery services to their homes.[15] We also have a significant population without indoor running water who utilize outhouses and honey buckets.

[15] FNSB, "2011: Comprehensive Economic Development Strategy", page 27

TABLE 21
ANNUAL TRENDS IN NUMBER OF MONTHLY WASTEWATER UTILITY CUSTOMERS BY TYPE (GHU AND CUC ONLY): 2000 - 2014

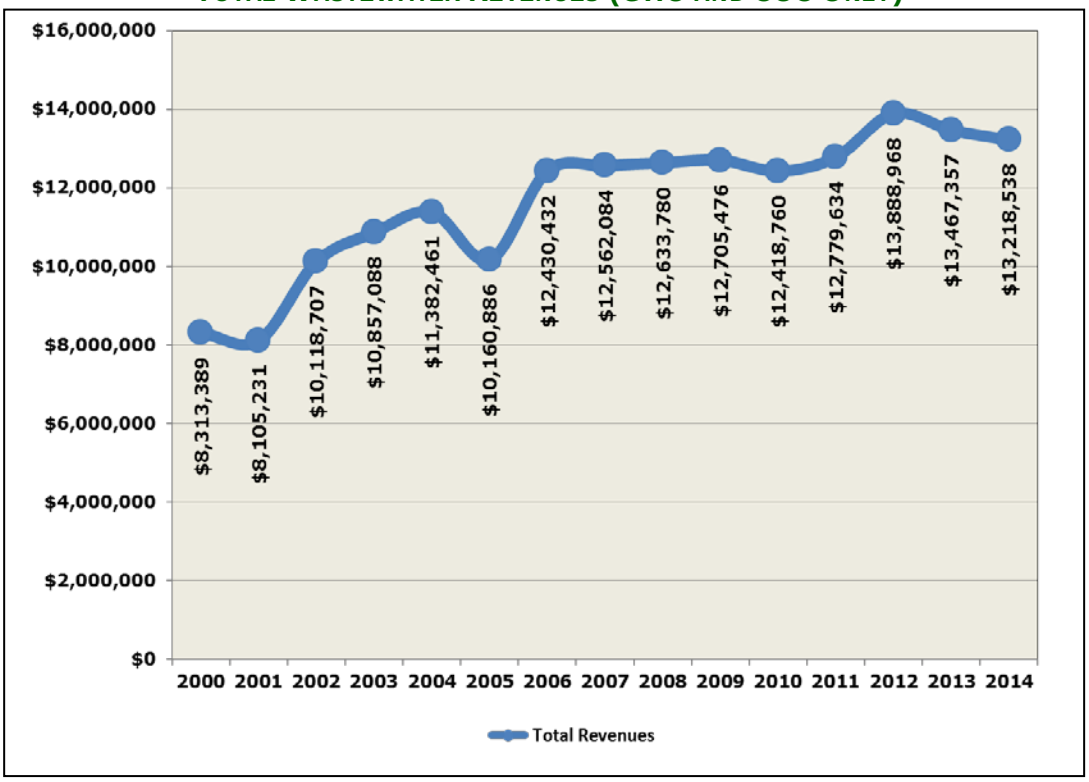
PERIOD	TOTAL	RESIDENTIAL	COMMERCIAL	OTHER
00-08 CAGR	1.1%	1.1%	1.5%	-2.3%
08-14 CAGR	0.4%	0.4%	0.1%	-1.1%
2014	8,729	7,395	1,310	24
2013	8,684	7,351	1,311	22
2012	8,647	7,304	1,321	2
2011	8,623	7,273	1,327	23
2010	8,604	7,265	1,313	26
2009	8,590	7,255	1,308	27
2008	8,536	7,209	1,301	26
2007	8,482	7,164	1,294	24
2006	8,434	7,128	1,282	24
2005	8,300	7,029	1,247	24
2004	8,175	6,930	1,219	26
2003	8,040	6,819	1,190	31
2001	7,898	6,702	1,164	32
2002	8,002	6,789	1,182	31
2000	7,808	6,619	1,158	31

Source: ADE, Inc., based on CUC and GHU annual reports

GHU and CUC have 8,729 wastewater customers, of which, the bulk, at 7,395, are residential, with 1,310 commercial customers. These two utilities' wastewater customers increased by 0.4 percent a year between 2008 and 2014, from 8,536 to 8,739 customers. In contrast, the number of customers increased by 1.1 percent annually from 2000 to 2008.

FIGURE 17

TOTAL WASTEWATER REVENUES (GHU AND CUC ONLY)

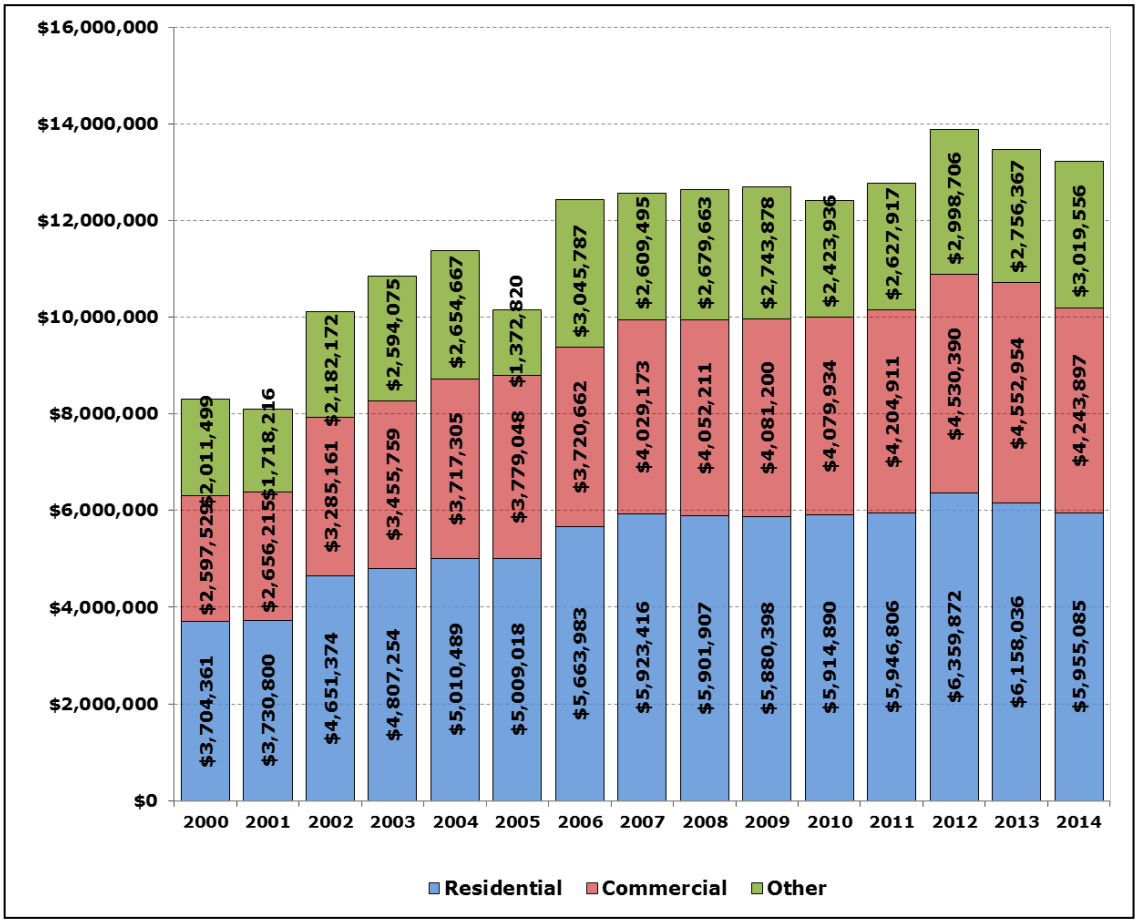


CUC and GHU generated $13.2 million in sales from wastewater services. Even through the Great Recession, wastewater revenue remained relatively stable, ranging anywhere between $12.4 million and $13.9 million a year.

Sales to residential customers have historically generated the largest share of combined total revenues for GHU and CUC, though commercial users are not far behind. In 2014, of the $13,218,538 in sales, $5,955,085 was from residential users and $4,243,897 from commercial users.

FIGURE 18

TOTAL WASTEWATER REVENUES GENERATED BY TYPE OF CUSTOMER: GHU AND CUC ONLY



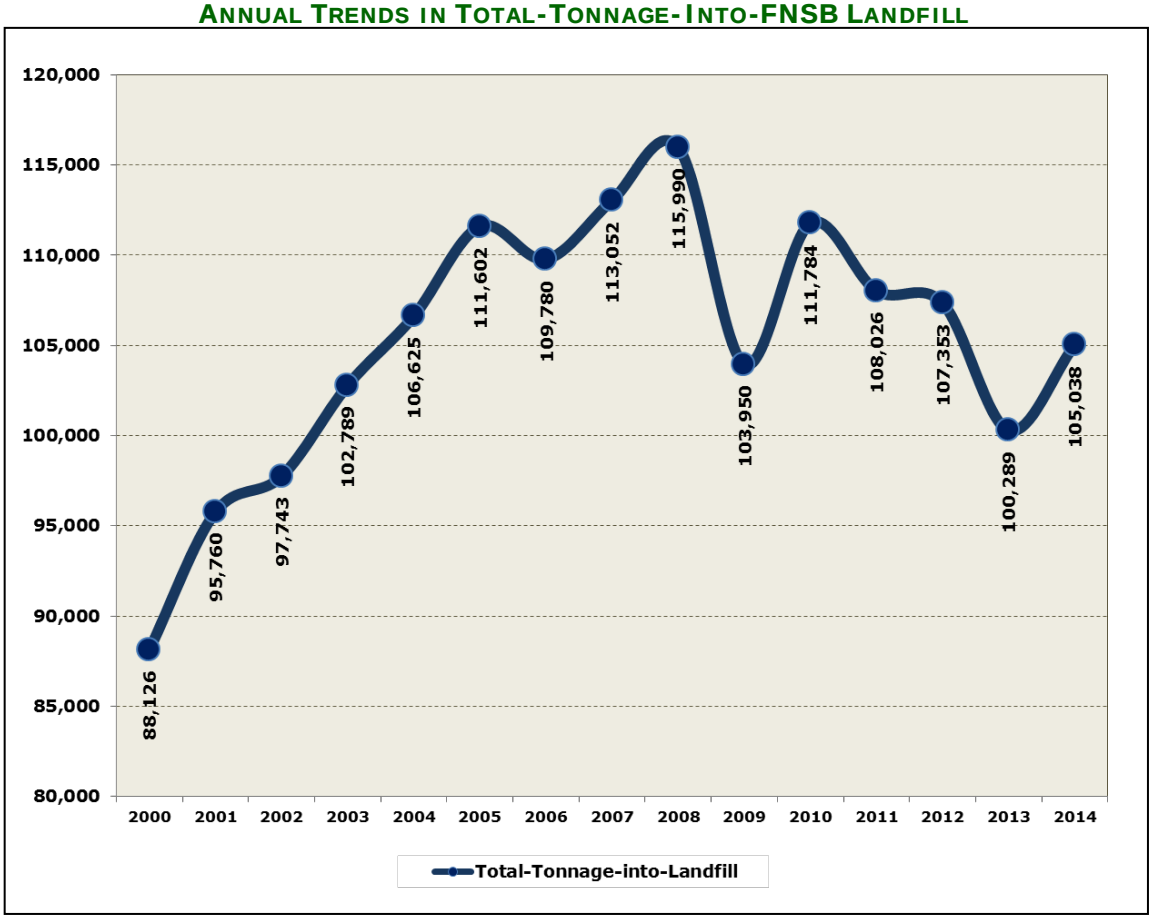
SOLID WASTE

The FNSB operates landfills for solid waste disposal. The Borough has solid waste transfer sites for residents living where there is no public trash collection service. These facilities accept a broad range of refuse including waste oil, batteries and have cells for disposal of asbestos. The City of Fairbanks provides residential trash collection service. Private trash collection is also available in the North Pole area at the curbside. Fort Wainwright Army Base and Eielson AFB have their own landfills for solid waste disposal.[16]

[16] FNSB, "2011: Comprehensive Economic Development Strategy", page 28

FIGURE 19

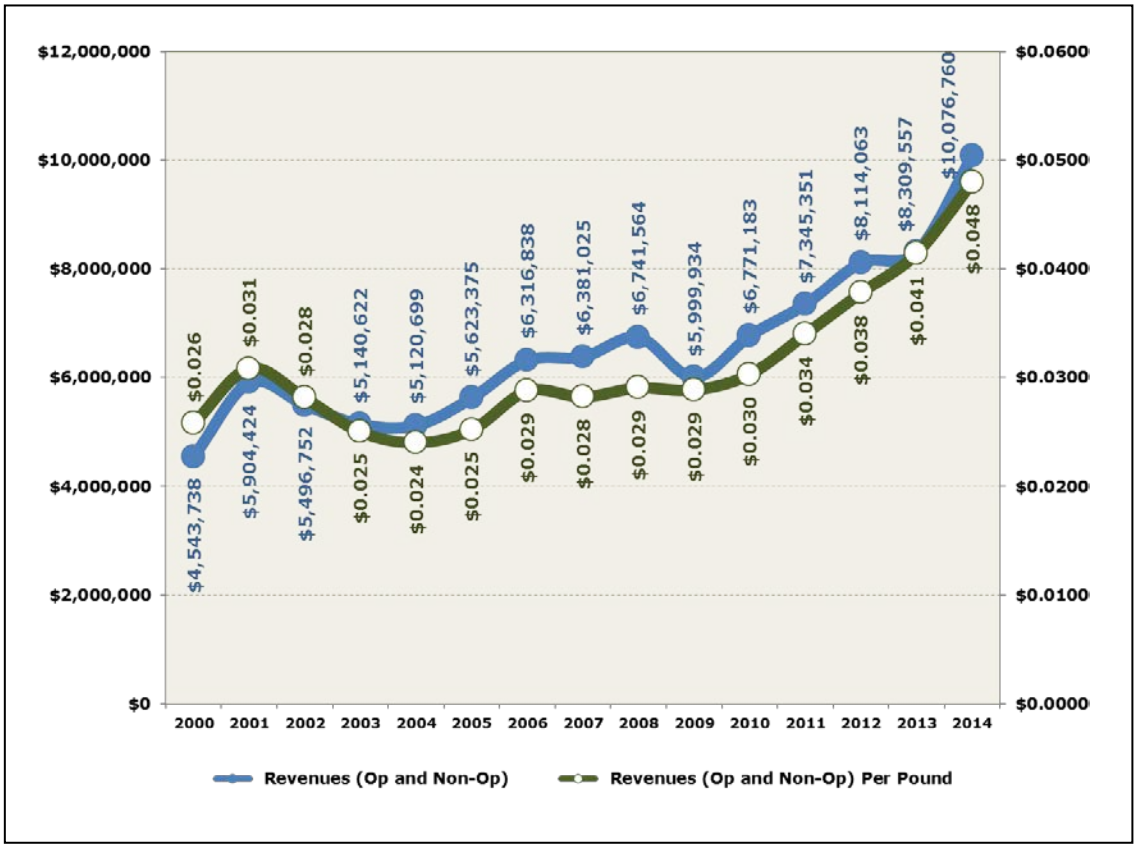
ANNUAL TRENDS IN TOTAL-TONNAGE-INTO-FNSB LANDFILL



The amount of tonnage into the FNSB landfill has declined by 1.6 percent a year, down from 115,990 tons in 2008 to 105,038 tons in 2014. The amount of material had increased annually by 3.5 percent in the years prior to the Great Recession, going from 88,126 tons in 2000 to 115,990 tons in 2008. To the extent that materials that otherwise would have gone to the landfill are being recycled, the annual decline of 1.6 percent from 2008 to 2014 is welcome news from the vantage-point of the environment. Even as less material has been directed to the landfill since 2008, aggregate operating revenues have increased over 2008 figures. In 2014, the FNSB landfill generated $10,076,760 in revenues, up from the $6,741,564 generated in 2008.

FIGURE 20

ANNUAL TRENDS IN TOTAL REVENUES AND REVENUES PER POUND GENERATED BY FNSB LANDFILL



NATURAL GAS

Local officials and stakeholders are exploring strategies for improving the natural gas infrastructure and delivery system in FNSB. In large part, officials are exploring natural gas options due to relatively high home heating costs borne by residents in the FNSB.[17] In the month of June 2012, natural gas cost on average $31.84 per McF in FNSB, whereas at the same time in Anchorage, natural gas cost significantly lower at $11.00.

TABLE 22
SIMPLIFIED FUEL COST COMPARISON:
FUEL OIL, PROPANE, NATURAL GAS: 2012

LOCATION, TARIFF, SYSTEM	FUEL OIL (JUNE, $ / GALLON)	PROPANE (JUNE, $ / GALLON)	NATURAL GAS (JUNE, $ / MCF)
	$1.00	**$1.12**	**$7.96**
Anchorage (June 2012)	**$1.38**	**$1.54**	**$11.00**
	$2.00	$2.24	$15.92
	$3.00	$3.35	$23.88
Fairbanks (June 2012)	**$4.00**	**$4.47**	**$31.84**
	$5.00	$5.59	$39.80
	$6.00	$6.71	$47.76
	$7.00	$7.83	$55.72

Source: ADE, Inc., based on Northern Economics, "FNSB: Gas Distribution System Analysis" (2012), p. viii

Of the natural gas providers operating in FNSB, Fairbanks Natural Gas LLC has 1,184 customers, 488 of which are residential and 696 commercial. Since 2008, the number of residential customers has grown annually by almost one percent, with commercial customers growing by 1.4 percent a year.

[17] Fairbanks North Star Borough, "Gas Distribution System Analysis" (by Northern Economics, with Baker, SLR and AEB) (2012), pages viii and ES-1

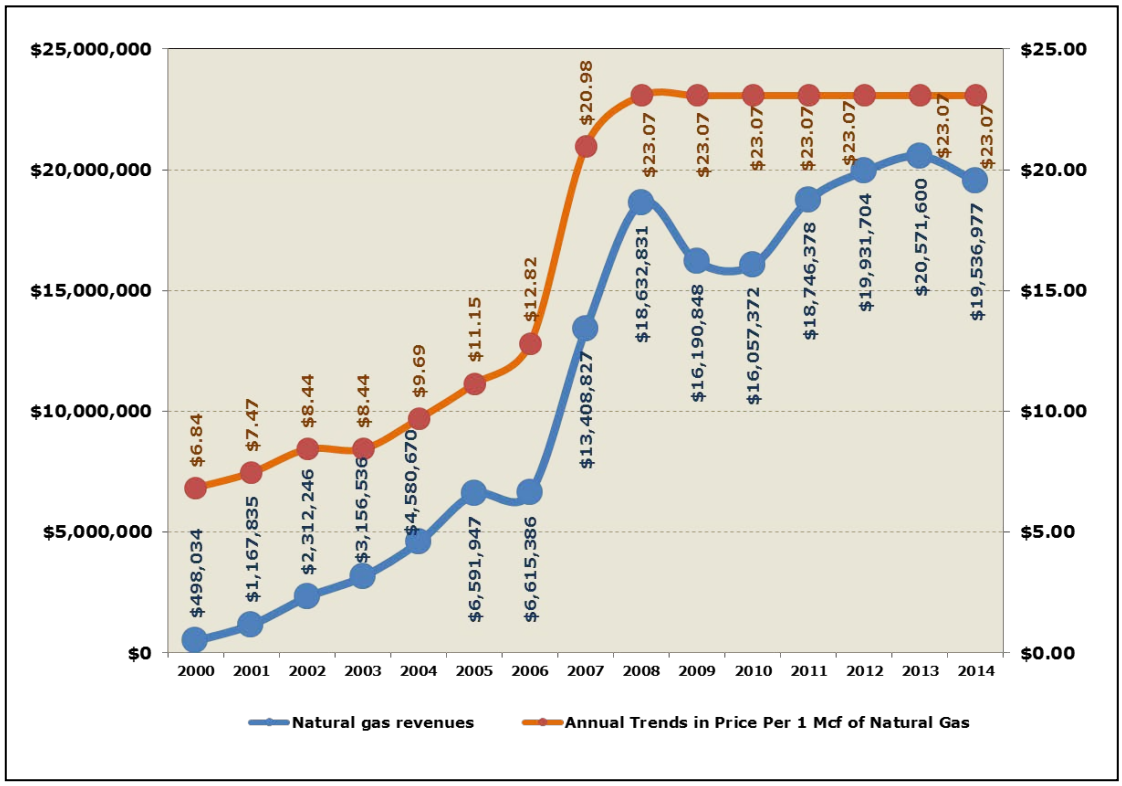
TABLE 23
ANNUAL TRENDS IN NUMBER OF NATURAL GAS CUSTOMERS

YEAR	RESIDENTIAL SUB-TOTAL	COMMERCIAL			TOTAL
		SMALL	LARGE	SUB-TOTAL	
08-14	0.9%	1.3%	2.7%	1.4%	**1.2%**
00-08	27.1%	24.9%	32.8%	25.2%	**26.0%**
2014	488	662	34	696	**1,184**
2013	464	629	31	660	**1,124**
2012	463	624	34	658	**1,121**
2011	463	622	34	656	**1,119**
2010	463	624	31	655	**1,118**
2009	441	643	30	673	**1,114**
2008	463	611	29	640	**1,103**
2007	463	591	26	617	**1,080**
2006	355	510	21	531	**886**
2005	341	379	19	398	**739**
2004	290	385	19	404	**694**
2003	231	308	18	326	**557**
2002	195	277	11	288	**483**
2001	152	205	10	215	**367**
2000	68	103	3	106	**174**

Source: ADE, Inc., , based on FNSB Community Research Center, Community Research Quarterly Spring 2008 and Spring 2015

Fairbanks Natural Gas generated $19,536,977 in revenues in 2014. Even as the unit price of natural gas has remained constant since 2008 at $23.07 per McF, this utility was affected by the Great Recession, as aggregated revenues went from $18,632,831 in 2008 to $16,190,848, dropping slightly more to $16,057,372 in 2010, then beginning to rebound in 2011 that continued to 2014 when revenues came in at $19,436,977.

FIGURE 21
ANNUAL TRENDS IN TOTAL NATURAL GAS REVENUES AND COST PER MCF: FAIRBANKS NATURAL GAS LLC



INSTITUTIONAL INFRASTRUCTURE

There are a number of institutions in FNSB critical to residents' economic and social well-being. Of these, four are discussed below. These are the military facilities in FNSB, the University of Alaska Fairbanks, special research centers at the UAF, and the non-profit social services sector.

MILITARY

The two military bases located within the FNSB are Fort Wainwright Army Base and Eielson Air Force Base (AFB). These facilities provide mission support, joint operations training, arctic operations training, and cold climate testing services for the US Army and Air Force missions in Alaska and abroad. Fort Wainwright Army Base borders the City of Fairbanks to the east and is home to the 172nd Stryker Brigade Combat Team which is comprised of the 1st Battalion 17th Infantry, 2nd Battalion 1st Infantry, 4th Battalion 11th Field Artillery, 4th Squadron 14 Cavalry, 172nd Brigade Support Battalion, 52nd AT Company, 562nd Engineer Company, 21st Signal Company, and the 572nd MI Company. Other US Army Alaska units stationed at Fort Wainwright Army Base include the 1st Battalion 52nd Aviation, 4th Battalion 123rd Aviation, 203rd Personnel Services Battalion, 507th Signal Company, Northern Warfare Training Center, and the 9th Army Band. Fort Wainwright Army Base is also the host

to a number of mission support tenant units, including the 3rd Air Support Operations Squadron and MEDDAC/DENTAC units.[18]

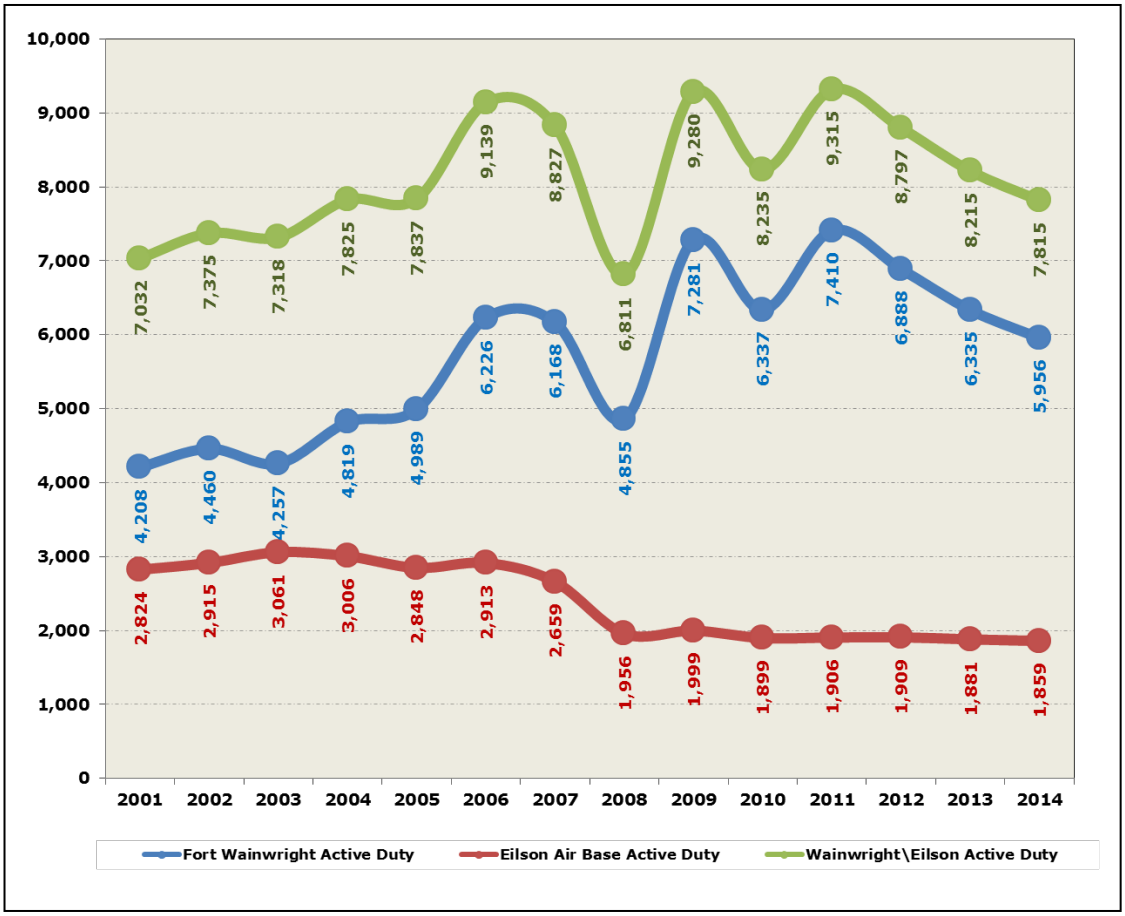
Eielson AFB borders the City of North Pole to the east and is home to the 354th Fighter Wing. The 354th Fighter Wing is comprised of the 354th Operations Group, the 354th Maintenance Group, the 354th Mission Support Group, and the 354th Medical Group. Eielson AFB is also host to the Alaska Air National Guard's 168th Aerial Refueling Wing and the 353rd Combat Training Squadron.

There are 7,815 active-duty military personnel stationed at Fort Wainwright and Eielson AFB combined. Of the 7,815 active-duty military personnel, 5,956 are at Fort Wainwright and 1,859 are at Eielson AFB. From 2001 to 2008, the number of active-duty personnel at Fort Wainwright increased annually by 2.1 percent a year, and the rate of increase picked-up even more from 2008 to 2014, to 3.5 percent a year. In contrast, active-duty personnel at Eielson AFB dropped by 5.1 percent a year from 2001 to 2008, and slid slightly by 0.8 percent a year from 2008 to 2014. However, Eielson is scheduled to receive a new fighter wing with up to 54 F-35s. This will add as many as 3,000 new jobs and dependents in FNSB, including private contractors.

Coincidentally, as the chart below shows, both military facilities experienced an inflection point in 2008. Typically, the decision to locate military personnel is not related to the ebb and flow of the larger civilian economy, but, in the case of both facilities, dramatic changes occurred on the eve of the Great Recession. The number of active-duty personnel at both facilities dropped dramatically from 8,827 in 2007 to 6,811 in 2008, then spiked again to 9,280 in 2009.

[18] FNSB, "2011: Comprehensive Economic Development Strategy", pages 28 and 29

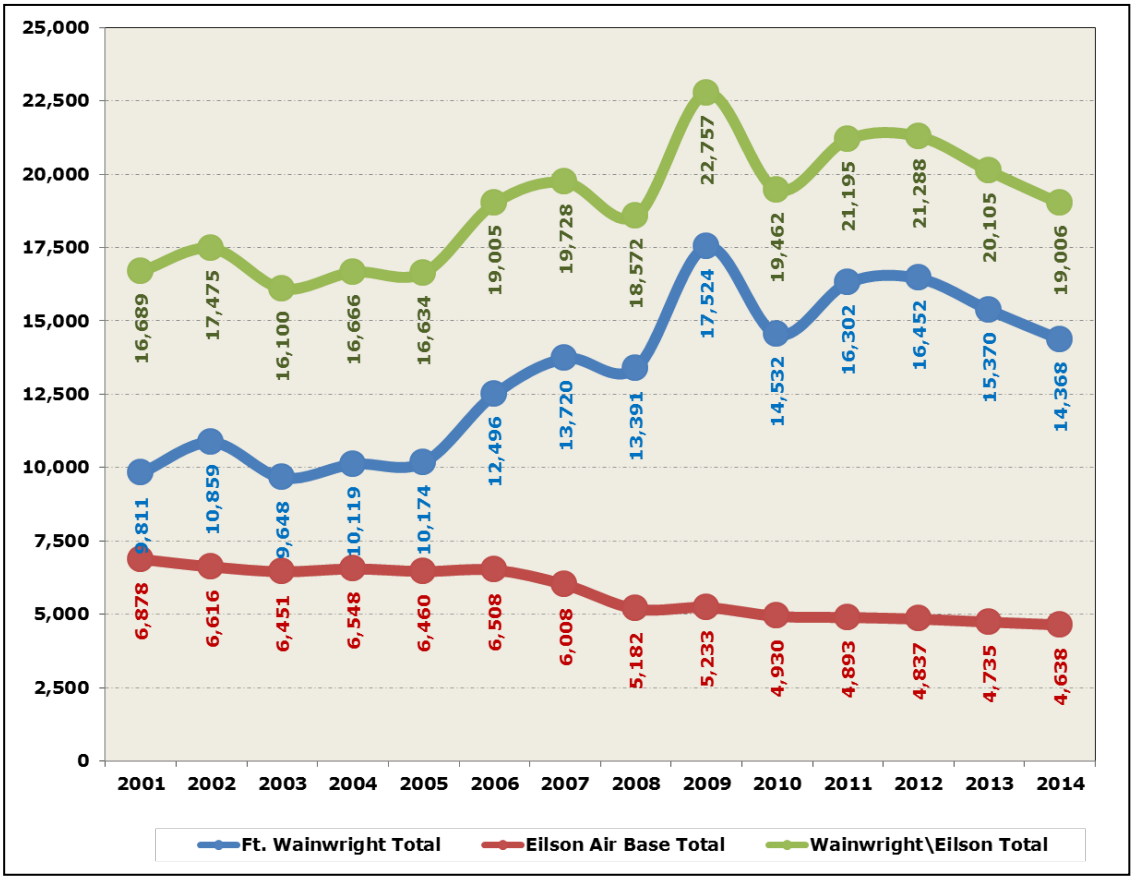
FIGURE 22
ANNUAL TRENDS IN NUMBER OF ACTIVE DUTY PERSONNEL AT FORT WAINWRIGHT AND EIELSON AIR FORCE BASE



In addition to the 7,815 active-duty personnel at these military facilities, there are 11,191 dependents – spouses and children of active duty personnel. Active duty personnel and dependents at the two facilities amount to 19,006 persons, with 14,368 at Fort Wainwright and 4,638 at Eielson. In addition to the active duty military personnel, Fort Wainwright Army Base currently employs 1,188 civilians, while Eielson AFB employs 480 civilians.[19]

[19] "Fort Wainwright" in US Military Bases (Sun Key Publishing) http://bit.ly/1LmZiRO and "Eielson Air Force Base" in Alaska F-35s (Fairbanks Economic Development Corporation) http://bit.ly/1ihASTb

FIGURE 23
ANNUAL TRENDS IN NUMBER OF ACTIVE DUTY PERSONNEL AND THEIR DEPENDENTS AT FORT WAINWRIGHT AND EIELSON AIR FORCE BASE (EIELSON MISSPELLED IN GRAPH KEY)



UNIVERSITY

UAF was founded in 1917 as the Alaska Agricultural College and School of Mines, and is a Land, Sea, and Space Grant institution. UAF is home to seven major research units. These units include the Agricultural and Forestry Experiment Station, Arctic Region Supercomputing Center, the Geophysical Institute, the Institute of Marine Science, the Institute of Arctic Biology, the Institute of Northern Engineering, and the International Arctic Research Center. The Alaska Native Language Center and the University of Alaska Museum of the North are also located on UAF's campus. UAF's Geophysical Institute operates the Poker Flat Research Range, the only university-owned scientific rocket launching facility in the nation.[20]

Eight academic schools and colleges are housed within UAF. These include the College of Engineering and Mines, the College of Liberal Arts, the College of Natural Science and Mathematics, the College of Rural and Community Development, the School of Education, the School of Fisheries and Ocean

[20] FNSB, "2011: Comprehensive Economic Development Strategy", page 30

Sciences, the School of Management, and the School of Natural Resources and Agricultural Sciences. UAF offers 168 degrees and 33 certificates in 127 disciplines and began offering a doctoral degree in nursing last year.

In Fall 2014, there were 11,235 students enrolled in the UAF system, with the bulk (at 6,159) enrolled at the Fairbanks campus. As the Great Recession proceeded, the number of enrollees increased from 11,821 in 2008, to 12,717 in 2009, 13,574 in 2010, and 13,624 in 2011. At 6,159 in 2014, enrollment at the Fairbanks campus is significantly ahead of the number of enrollees in 2008 (4,976) and the years soon after 2008. From 2009 to 2012, enrollment at the Fairbanks campus ranged from 4,976 to 6,184, and then dropped slightly to 6,159 in 2014.

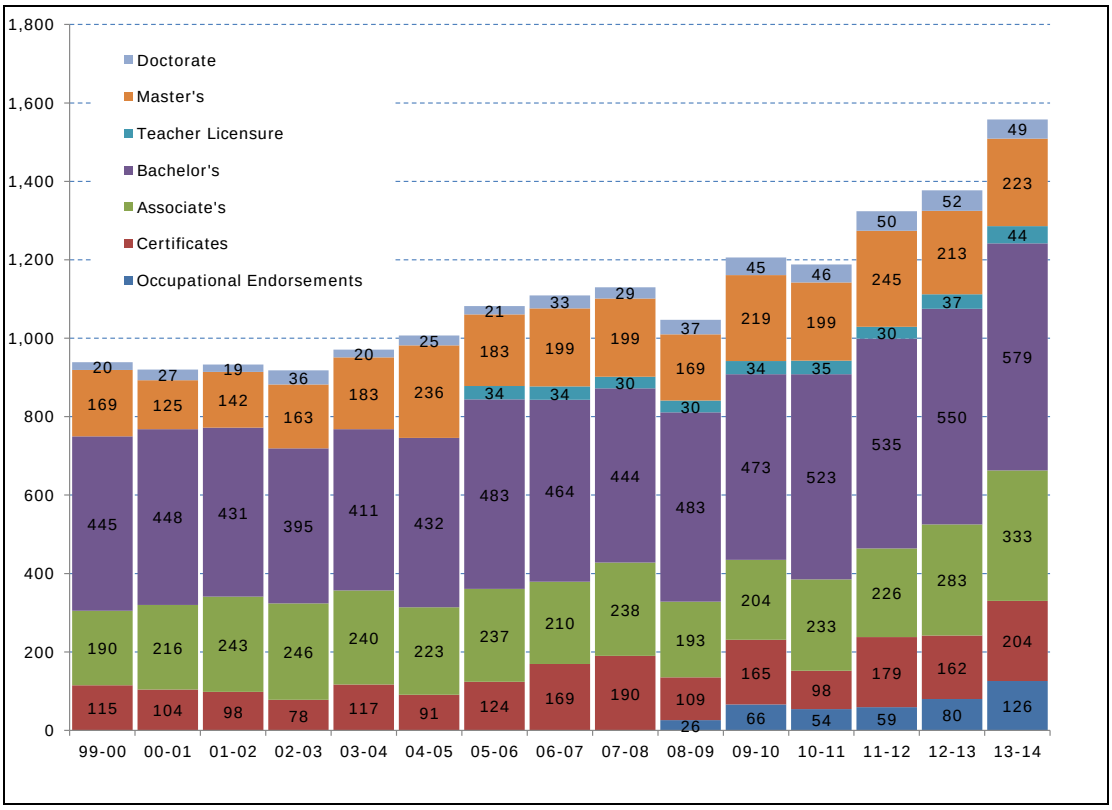
TABLE 24

FALL ENROLLMENT: UNIVERSITY OF ALASKA FAIRBANKS (ALL CAMPUSES)

	URBAN		RURAL					OTHER	URBAN SUB-TOTAL	RURAL SUB-TOTAL	OTHER	TOTAL ENROLLMENT (COMBINED COUNT)
	Fairbanks	Career & Technical College	Bristol Bay	Chukchi	Interior-Aleutians	Kuskokwim	Northwest	Rural College				
2003	5,412	3,330	404	243	457	326	321	1,441	8,742	1,751	1,441	11,934
2004	5,291	3,306	327	235	304	317	384	2,056	8,597	1,567	2,056	12,220
2005	5,270	3,090	215	146	285	250	127	2,205	8,360	1,023	2,205	11,588
2006	5,034	3,147	272	177	244	218	262	2,124	8,181	1,173	2,124	11,478
2007	5,036	3,059	494	182	285	233	270	2,112	8,095	1,464	2,112	11,671
2008	4,976	3,160	374	361	257	223	188	2,282	8,136	1,403	2,282	11,821
2009	5,271	3,257	478	378	334	281	161	2,557	8,528	1,632	2,557	12,717
2010	5,504	3,520	460	332	392	231	364	2,771	9,024	1,779	2,771	13,574
2011	5,668	3,616	544	184	304	244	225	2,839	9,284	1,501	2,839	13,624
2012	5,314	3,244	308	265	273	206	197	2,633	8,558	1,249	2,633	12,440
2013	6,184	3,236	358	331	205	393	196	1,025	9,420	1,483	1,025	11,928
2014	6,159	3,009	292	97	186	385	203	904	9,168	1,163	904	11,235
03-08 CAGR	-2%	-1%	-2%	8%	-11%	-7%	-10%	10%	-1%	-4%	10%	0%
08-14 CAGR	4%	-1%	-4%	-20%	-5%	10%	1%	-14%	2%	-3%	-14%	-1%

In 2014, the UAF system issued 579 Bachelor's degrees, up from 550 in 2013, 535 in 2012, and 473 in 2011. The number of Bachelor's degrees issued in 2014 was the highest over the 14-year period from 1999-2000 school year to 2013-2014 school year. UAF also issued the most AA degrees in 2014 relative to any other school year during the 1999-2000 to 2013-2014 period.

FIGURE 24
NUMBER OF GRADUATES RECEIVING DEGREES AND CERTIFICATES: UNIVERSITY OF ALASKA AT FAIRBANKS



RESEARCH AND TECHNOLOGY

In 2010, UAF, established an Office of Intellectual Property and Commercialization to help commercialize research generated within the university. This includes research on arctic squirrels, blueberries, minerals and satellite mapping. There is a local group of investors that regularly meets with University researchers to learn about their products and investment opportunities. In addition to commercializing research, the University has played a leading role in research and development in fields unique to the climatic attributes of Alaska. The Cold Climate Housing Research Center (CCHRC) is a private non-profit corporation created by the home building community to facilitate the development, use, and testing of sustainable, durable, healthy, and cost-effective building technologies for people living in the Circumpolar North. In September 2006, Cold Climate Housing Research Center (CCHRC) finished construction of a cold weather research test facility and demonstration project on a 2.5 acre parcel within the 30 acre parcel UAF has identified for a research park. The Sustainable Northern Communities project was initiated in 2008 to address the needs for sustainable rural housing in northern climates. The project investigates, develops and incorporates many sustainable solutions that will benefit northern communities by demonstrating a culturally

designed, affordable, replicable and simply constructed home that uses very little water or energy. CCHRC is partnering with university researchers, industry experts and entrepreneurs to develop, test, and certify arctic and energy efficient construction techniques, materials, and products.[21]

NON-PROFIT SOCIAL SERVICES

FNSB has an important social services sector, comprised not only of government agencies but also a variety of non-profit organizations. Employment in the health care and social services sector in the Borough reached nearly 5,000 jobs in 2014, with another 467 jobs in arts and recreation services that also promote physical and social well-being. Additional related services and jobs are provided in education, legal services, and food services. Organizations serve both youth and the elderly, as well as a number of populations at risk such as non-English speakers, AIDS and Alzheimer's patients, the homeless and families in poverty. Many of the services are designed to be preventative and keep people healthy and productive. Providing mental health services is particularly challenging, however, as the main treatment facility in the Borough has closed.

In addition to private charitable funds, corporate support and volunteers, two grant funds help support organizations in this sector: the Community Matching Grant Fund, which receives state funds, and the Matching Assistance Grant Program, which is operated just within FNSB.[22] The former program offers grants up to $50,000 and in FY 2014 was able to fund ten organizations out of 12-14 applications received. This program has seen some decline in state support due to lower state revenues from declining oil prices. The second program offers matching grants up to $25,000 and is supported wholly from Borough funds. The recipient organizations must have commitments for other grants from outside agencies to complete funding for each project. It is estimated that the organization receiving these grants generate a 15 fold return in terms of other income generated, in-kind contributions and other multiplier effects.

The efforts of many of these organizations relate directly to economic development in terms of promoting job security and wage progression for at-risk populations. The community is particularly concerned with serving the needs of disabled workers and the incarcerated population as they seek to transition into private sector jobs.

ECONOMIC INFRASTRUCTURE

Economic development practitioners and planners have traditionally divided economies into two broad industrial categories—the "economic base" and "local support" industries. Economic base industries are the drivers of local and regional economies in that these industries draw income into a local economy by selling products outside of the local economy, much like the export industries of a national economy. Accrued earnings then circulate throughout the local area in the form of wages and salaries; proprietor income; investments; purchases of fixed assets, goods, and services; and generation of more jobs and wealth. The economic base is typically comprised of industries within the

---

[21] FNSB, "2011: Comprehensive Economic Development Strategy", page 30

[22] Peter Pinney, Executive Dean, College of Rural and Community Development, University of Alaska Fairbanks, personal communication, August 25, 2015

manufacturing, minerals-resource extraction, and agricultural sectors. Tourism can be an economic base industry in so far as it brings income from the outside. There are also the "local support industries" such as retail or service sectors, the progress of which is a function of the economic base and demographic changes, and more so the latter than the former. As population increases in a given area, demand for services–such as realtors, teachers, and healthcare increase, as does demand for basic retail items like groceries, gas for commuting, or clothing at local shops.

While FNSB is blessed with multiple sectors and industries that comprise this Borough's economic base, one key broadly-construed sector – resource extraction (mining and oil-natural gas) – involve activities occurring outside of the FNSB. Yet resource extraction remains one of FNSB's economic bases because this Borough serves as a staging ground for resource extraction occurring in the North Slope and Interior Alaska regions. The Fort Knox Gold Mine is located within the Borough, as well as some smaller mining operations.

MINING, OIL AND GAS DEVELOPMENT

The mining and oil and natural gas industries dominate Alaska's economy, with the North Slope region containing more than a dozen of the 100 largest oil fields in the United States and several of the 100 largest natural gas fields. Alaska's North Slope is one of the largest oil fields in the country, although production has fallen to less than 500,000 barrels per day from its peak of 2.0 million barrels per day in 1988.[23] The FNSB serves as an important staging area for oil and gas exploration, development, and production in Alaska's Northern and Interior Regions, particularly as the FNSB is the midpoint of the 800 mile Trans-Alaska Pipeline System (TAPS) running from Prudhoe Bay south to Valdez. The TAPS supplies the Petro Star refinery located in the FNSB with Alaska North Slope (ANS) crude oil. Similarly, the FNSB serves as a staging area for much of the State's mineral exploration and development. Three of the state's largest mining operations (Usibelli, Fort Knox and Pogo) lie within 150 miles of Fairbanks.[24]

MINERAL DEVELOPMENT

In 2013, the economic value of Alaska's mining industry as a whole was $3.9 billion. Of this amount, the production or market value of mined resources was $3.4 billion, development cost was $358.8 million, and exploration cost for future resources was $175.5 million. At $1.46 billion, the economic value of mining industry in the Eastern Interior region – of which the FNSB is a part and a staging ground into – was 37 percent of Alaska's total.

Moreover, relative to the state as a whole, mining is growing the fastest in the Eastern Interior. From 2000 to 2008, the economic value of mining in this region grew annually by 24 percent, then by 12 percent per year from 2008 to 2013. In comparison, the total value of mining in the state grew by 14.3 percent per year between 2000 and 2008, and by 4.5 percent per year between 2008 and 2014.

---

[23] US Department of Energy, Energy Information Administration, "Monthly Alaska North Slope Crude Oil Production (Thousand Barrels): January 1981 through April 2015" (http://bit.ly/1NFSqjq

[24] FNSB, "2011: Comprehensive Economic Development Strategy", pages 34 and 35

The total economic value of Eastern Interior mining continued its upward trajectory through the Great Recession, while in the state as a whole, mining declined from 2007 through to 2009, recovering by 2010.

FIGURE 25
ANNUAL TRENDS IN TOTAL ECONOMIC VALUE OF MINING IN ALASKA AND EASTERN INTERIOR REGION

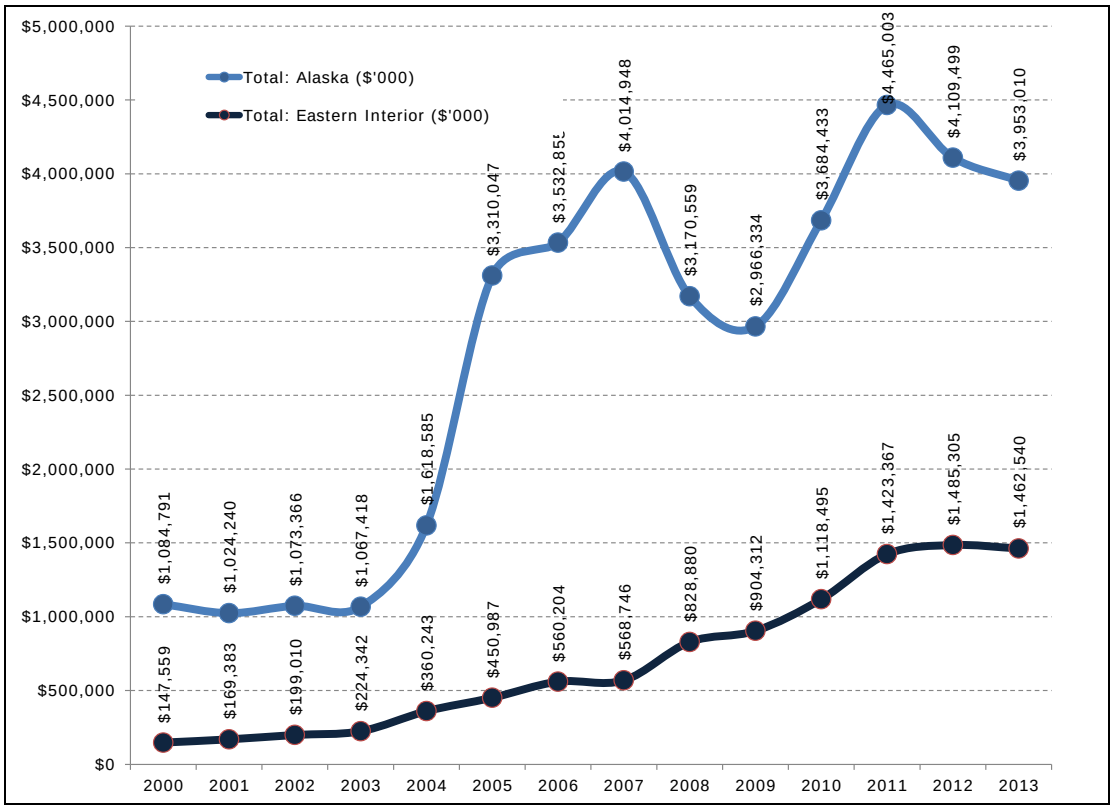
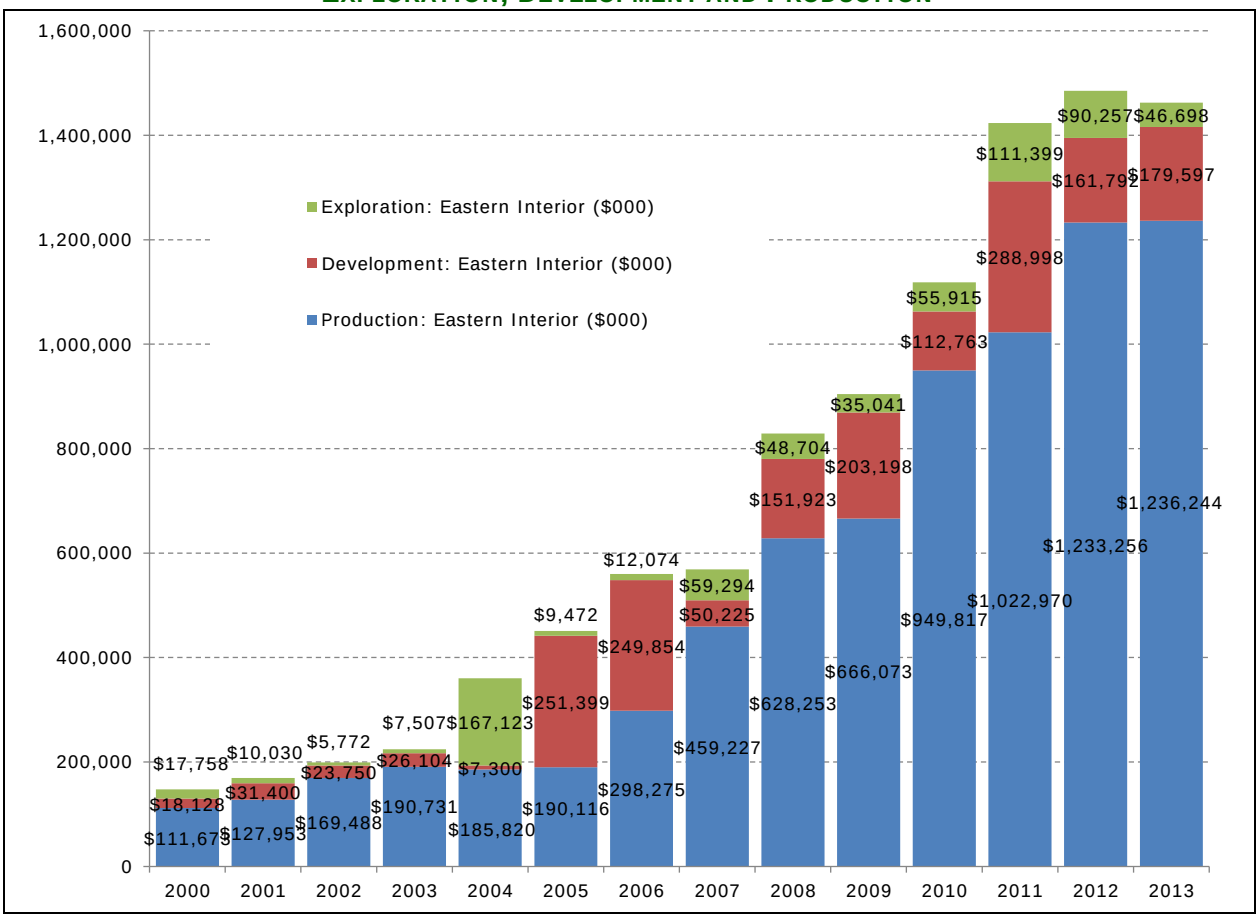


FIGURE 26
ANNUAL TRENDS IN ECONOMIC VALUE OF MINING IN EASTERN INTERIOR REGION BY EXPLORATION, DEVELOPMENT AND PRODUCTION



All of the 2013 $1.24 billion production value of minerals extracted in the Eastern Region was for gold and various types of sands and rocks, with gold accounting for 98 percent. In contrast, the value of all minerals produced in Alaska in 2013 was $3.42 billion, of which 48 percent was for gold and various types of sands and rocks.

TABLE 25
TRENDS IN AGGREGATE VALUE OF PRODUCTION: SELECT MINING INDUSTRY COMMODITIES (GOLD AND SANDS-AND-ROCKS)

	2000	2005	2008	2010	2013	00-08	08-13
Alaska	**$240,526,000**	**$289,002,000**	**$809,987,462**	**$1,172,087,071**	**$1,636,979,978**	**16.4%**	**15.1%**
Gold	$154,058,000	$189,918,000	$698,223,883	$1,119,785,870	$1,551,921,325	20.8%	17.3%
Sands-and-Rocks	$86,468,000	$99,084,000	$111,763,579	$52,301,201	$85,058,653	3.3%	-5.3%
Eastern Interior	**$111,673,315**	**$190,115,795**	**$628,253,434**	**$949,817,424**	**$1,236,244,165**	**24.1%**	**14.5%**
Gold	$106,222,815	$150,951,168	$614,151,223	$938,584,864	$1,214,247,474	24.5%	14.6%
Sands and Rocks	$5,450,500	$39,164,627	$14,102,211	$11,232,560	$21,996,691	12.6%	9.3%

Source: Applied Development Economics, based on State of Alaska Division of Geological and Geophysical Surveys, Annual Alaska Mineral Industry Reports (2000 through 2013)

In 2013, Alaska produced 1,022,987 ounces of gold, of which, 800,401 ounces came from the Eastern Interior region. Of the 800,401 ounces, 766,215 came from Fort Knox Mine and Pogo Mine, which are both in the FNSB. The amount of gold produced by Fort Knox Mine has grown by over 5 percent annually since 2008, while gold from Pogo has remained relatively flat, declining slightly by 0.6 percent annually over the same period.

TABLE 26
TRENDS IN PRODUCTION OF OUNCES OF GOLD IN EASTERN INTERIOR REGION

YEAR	GOLD: ALASKA	TOTAL EASTERN INTERIOR	FORT KNOX MINE	POGO MINE	REST OF EASTERN INTERIOR
08-13 CAGR	5.0%	2.6%	5.4%	-0.6%	4.1%
00-08 CAGR	4.8%	7.6%	-1.2%		-0.8%
2013	1,022,987	800,401	428,822	337,393	34,186
2012	921,240	720,219	359,948	315,886	44,385
2011	848,929	650,931	289,794	325,708	35,429
2010	914,462	766,486	349,729	383,434	33,323
2009	780,657	671,323	263,260	389,808	18,255
2008	800,752	704,334	329,105	347,219	28,010
2007	726,933	621,784	338,459	259,820	23,505
2006	570,129	474,900	333,383	113,364	28,153
2005	427,031	339,414	329,320		10,094
2004	456,485	351,937	338,334		13,603
2003	528,191	403,379	391,831		11,548
2002	562,094	421,364	410,519		10,845
2001	550,644	423,699	411,220		12,479
2000	551,982	392,862	362,929		29,933

Source: Applied Development Economics, based on State of Alaska Division of Geological and Geophysical Surveys, Annual Alaska Mineral Industry Reports (2000 through 2013)

FIGURE 27

ANNUAL TRENDS IN PRODUCTION OF OUNCE OF GOLD: EASTERN INTERIOR REGION

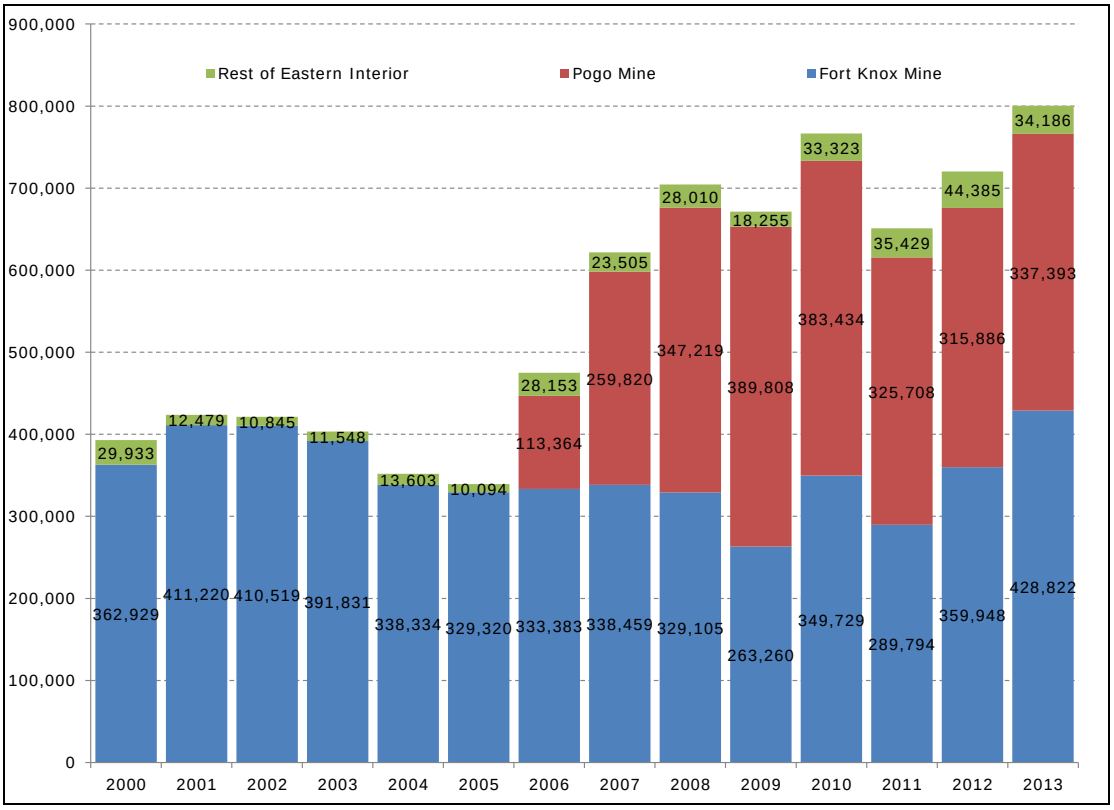
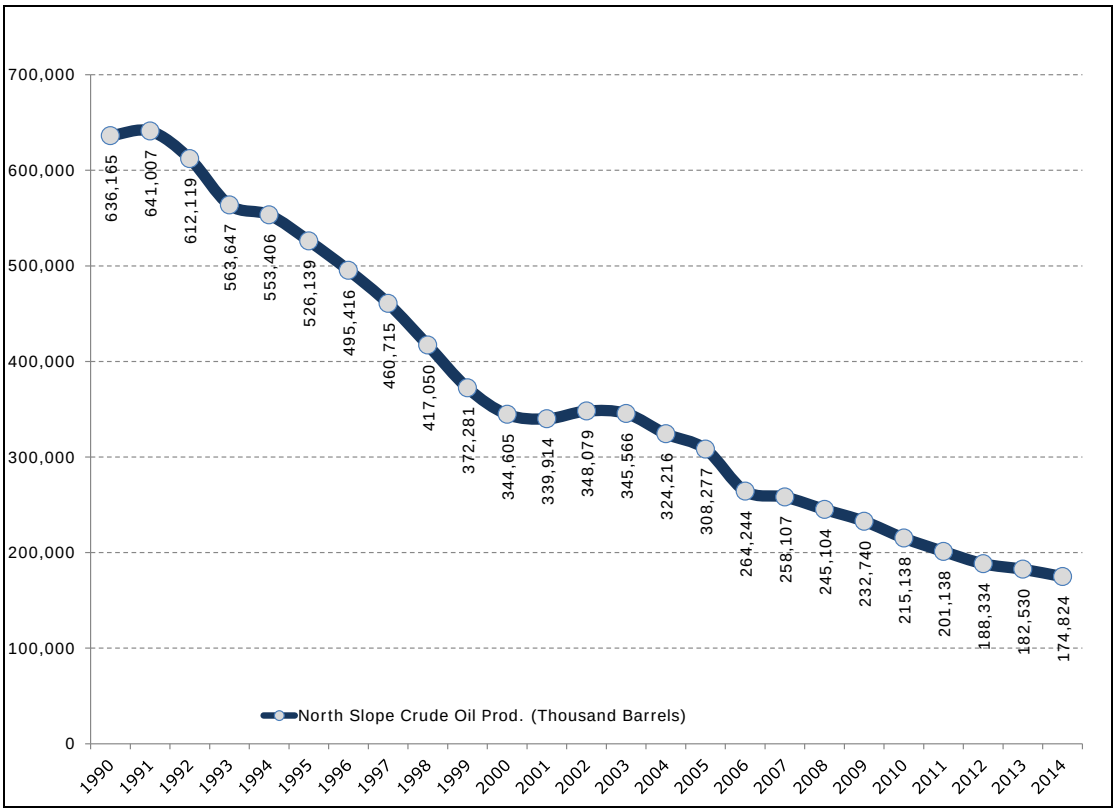


FIGURE 28

ANNUAL TRENDS IN BARRELS OF OIL PRODUCED IN NORTH SLOPE REGION



Although Alaska's oil production has declined steadily as the state's oil fields have matured, it is still one of the top crude oil producers in the nation, with most oil production taking place on the North Slope, according to the US EIA. Alaska is the second leading natural gas producer (in terms of gross withdrawals) in the United States. However, most of the state's production is not brought to market, because natural gas volumes far exceed local demand. Also, there is insufficient pipeline capacity to transport the natural gas to distant markets. Most of the extracted natural gas is reinjected into existing oil fields to provide pressure to maintain oil production rates.[25]

TABLE 27

ANNUAL TRENDS IN CRUDE OIL PRODUCTION: ALASKA NORTH SLOPE

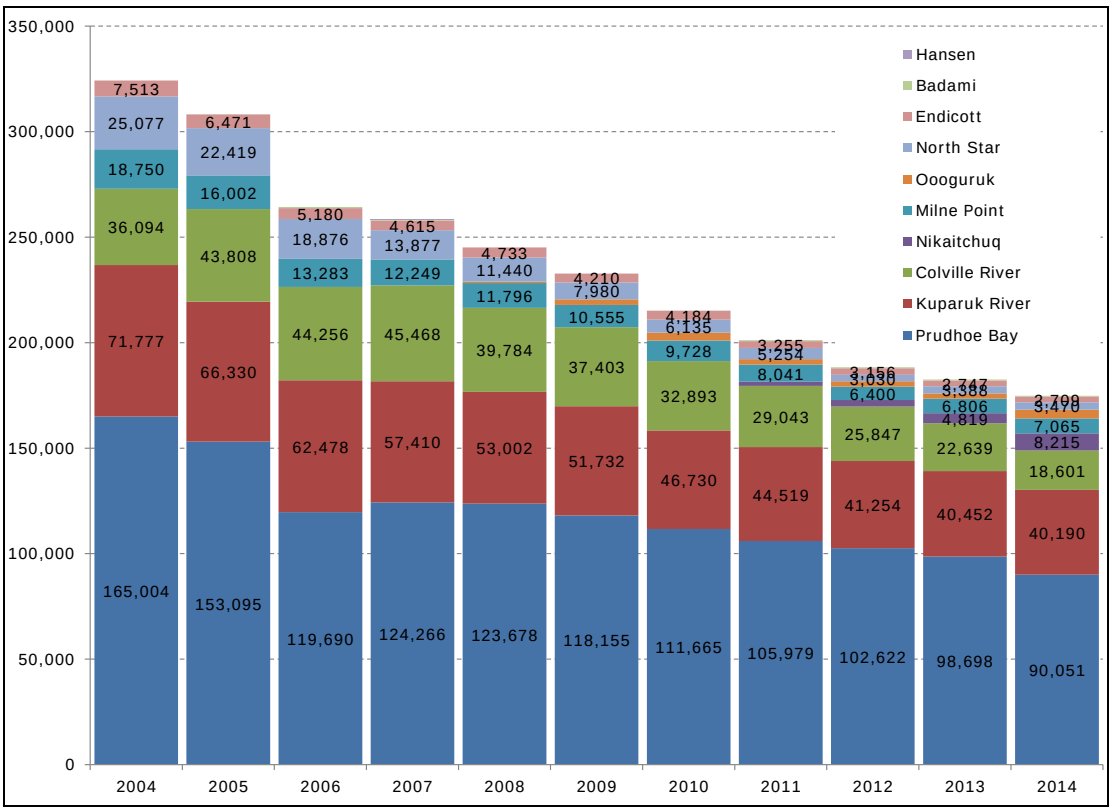
('000 BARRELS)	2000	2005	2008	2010	2014	00-08 CAGR	08-14 CAGR
North Slope Crude Oil Prod. (Thousand Barrels)	344,605	308,277	245,104	215,138	174,824	-4.2%	-5.5%

Source: Applied Development Economics, based on US Dept. of Energy EIA

[25] US Department of Energy, Energy Information Administration, "Alaska: State Profile and Energy Estimates" (http://bit.ly/1HpowfQ)

Oil produced in the North Slope region dropped by 5.5 percent a year from 2008 to 2014, an annual rate of decline that exceeded the 4.2 percent for the 2000-2008 period. In 2014, the North Slope region generated 174,824,000 barrels of oil, down from 245,104,000 in 2008. Of the oil generated in the North Slope, the bulk come from fields in the Prudhoe Bay, which in 2014 generated 90,051,000 barrels of oil, or 52 percent of North Slope oil. Historically, fifty percent of all oil produced in the North Slope comes from Prudhoe Bay.

FIGURE 29
ANNUAL TRENDS IN BARRELS OF OIL PRODUCED IN NORTH SLOPE OIL FIELDS



Of the 3,190,932 MMcF of natural gas withdrawn from Alaska as a whole, 3,076,362 MMcF (96 percent) come from the North Slope region and, of this amount, 2,647,306 MMcf (or 86 percent of North Slope) come from Prudhoe Bay. Historically, 86 percent of all natural gas withdrawn from the North Slope come from Prudhoe Bay. The total volume of natural gas withdrawn from the North Slope has remained somewhat steady each year since 2008, averaging around 3,100,000 MMcF a year.

Table 28
Annual Trends in Alaska North Slope Natural Gas Gross Withdrawals (MMcf)
By Fields

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	04-08	08-14
Total Alaska	3,663,984	3,663,424	3,223,352	3,498,322	3,434,769	3,330,453	3,214,494	3,184,786	3,181,990	3,224,429	3,190,932	-1.6%	-1.2%
Total North Slope	3,455,031	3,451,703	3,026,646	3,329,962	3,281,807	3,191,366	3,085,767	3,066,445	3,072,397	3,137,139	3,076,362	-1.3%	-1.1%
Prudhoe Bay	3,035,805	2,986,593	2,581,850	2,864,563	2,802,030	2,748,965	2,638,782	2,637,145	2,708,719	2,747,061	2,647,306	-2.0%	-0.9%
North Star	104,383	142,131	142,296	151,145	175,958	167,618	170,453	189,985	131,833	175,956	193,059	13.9%	1.6%
Endicott	131,156	140,335	123,052	138,536	136,608	118,073	131,861	112,233	120,013	103,462	122,719	1.0%	-1.8%
Kuparuk River	125,381	119,323	112,395	114,098	107,789	100,685	97,113	86,520	74,680	74,263	80,683	-3.7%	-4.7%
Colville River	45,200	49,510	52,268	52,760	50,093	45,876	36,940	29,601	28,110	27,617	22,091	2.6%	-12.8%
Milne Point	11,690	11,304	9,217	7,106	7,463	7,186	5,856	5,421	4,253	4,252	3,882	-10.6%	-10.3%
Oooguruk	0	0	0	0	384	1,805	2,747	2,873	2,401	2,182	3,159		42.0%
Walakpa	1,245	1,255	1,244	1,156	1,196	1,022	1,305	1,230	1,287	1,375	1,556	-1.0%	4.5%
Nikaitchuq	0	0	0	0	0	0	0	277	417	652	1,229		
Badami	0	1,120	4,202	412	0	0	374	815	389	269	556		
Barrow	170	133	122	174	285	136	335	347	296	48	121	13.8%	-13.3%
Hansen	0	0	0	12	0	0	0	0	0	0	0		

Source: Applied Development Economics, based on US DOE EIA (Petroleum and Other Liquids [https://archive.is/wWqCl and https://archive.is/M0Ry1]) and Alaska Oil and Gas Conservation Commission (Monthly Production Reports [https://archive.is/qnJtP])

FORESTRY

The Tanana Valley State Forest covers approximately 1,798,727 acres and extends about 450 miles east from the City of Tanana at the confluence of the Tanana and Yukon rivers to the Canadian border. Approximately 578,000 acres of this forest are within the FNSB's boundaries.[26] In addition to the Tanana Valley State Forest, there are also state lands that are classified as forest. These lands encompass an additional 1,074,512 acres.[27]

TABLE 29
EXISTING CONDITIONS IN TANANA VALLEY WITH RESPECT TO TIMBER: ACREAGE BY MANAGEMENT AREA AND CLASSIFICATION

MANAGEMENT AREAS	TOTAL ACRES	TANANA VALLEY STATE FOREST ACRES	FOREST CLASSIFIED ACRES
Kantishna	569,324	311,192	258,132
Fairbanks	860,366	594,251	266,115
Delta	851,736	499,625	352,111
Tok	591,813	393,659	198,154
Totals	2,873,239	1,798,727	1,074,512

Source: Applied Development Economics, based on State of Alaska Dept. of Natural Resource, Division of Forestry, "Timber Inventory of State Forest Lands in the Tanana Valley 2013" (p. 1)

Of the 2,873,239 acres of forest land managed by the State of Alaska, timber is grown for harvesting on 2,152,935 acres, 633,292 of which are in the Fairbanks Management Area. This management area contains 699,571,000 cubic feet (or 1,480,844,000 board foot) of lumber.

TABLE 30
EXISTING CONDITIONS IN TANANA VALLEY WITH RESPECT TO TIMBER: MANAGEMENT AREA TIMBERLAND ACREAGE AND VOLUME SUMMARY

MANAGEMENT AREAS	TOTAL ACRES	TIMBERLAND ACRES	TOTAL NET CUBIC VOLUME (MCF)	TOTAL NET BOARD FOOT VOLUME (MBF)
Kantishna	569,324	438,235	431,486	806,820
Fairbanks	860,366	633,292	699,571	1,480,844
Delta	851,736	639,801	637,537	1,297,644
Tok	591,813	441,607	304,165	472,199
Totals	**2,873,239**	**2,152,935**	**2,072,759**	**4,057,506**

Source: Applied Development Economics, based on State of Alaska Dept. of Natural Resource, Division of Forestry, "Timber Inventory of State Forest Lands in the Tanana Valley 2013" (p. 1)

[26] FNSB, "2011: Comprehensive Economic Development Strategy", pages 32 and 33

[27] Alaska Dept. of Natural Resource, Division of Forestry, "Timber Inventory of State Forest Lands in the Tanana Valley 2013" (p. 1)

Of the 699,571,000 cubic feet of lumber in the Fairbanks Management Area, the State of Alaska has established a maximum allowable amount of timber subject to harvesting, or 8,506,488 cubic feet per year over five years (2014-2018).

TABLE 31
TANANA VALLEY ANNUAL ALLOWABLE CUT (AAC) DETERMINATION

MANAGEMENT AREAS	AAC (ACRES PER YEAR OVER 5 YEAR 2014-2018 PERIOD)	CUBIC FOOT VOLUME
All	13,974	24,407,152
Kantishna	3,050	5,540,528
Fairbanks	4,606	8,506,488
Delta	3,948	7,265,294
Tok	2,370	3,094,842

Source: Applied Development Economics, based on State of Alaska Dept. of Natural Resource, Division of Forestry, "Timber Inventory of State Forest Lands in the Tanana Valley 2013" (p. 35-39)

While the maximum annual allowable timber subject to harvesting in the Fairbanks Management Area is 8,506,488 cubic feet per year, the State is further limiting the actual amount of timber subject to harvesting. In a document called the "Five Year Schedule of Timber Sales FY 2014 to FY 2015", the Alaska Department of Natural Resources, Division of Forestry, Fairbanks Area Forestry proposed limiting harvesting in the Fairbanks and Kantishna Management Areas to 2,223,881 cubic feet per year over a five-year period, or 16 percent of what is allowed under the annual allowable cut regime.

TABLE 32
RELATIONSHIP BETWEEN PROPOSED ANNUAL HARVEST TO ANNUAL ALLOWABLE CUTS: FAIRBANKS AND KANTISHNA MANAGEMENT AREAS ONLY

	ACRES	CUBIC FEET
Proposed ANR Average Annual Harvest For Kantishna and Fairbanks Management Areas (Combined)	1,073	2,223,881
Annual Allowable Cut for Kantishna and Fairbanks Management Areas (Combined)	7,656	14,047,016
Percentage	14%	16%

Source: Applied Development Economics, based on Alaska Department of Natural Resources, Division of Forestry, Fairbanks Area Forestry, "Five Year Schedule of Timber Sales FY 2014 to FY 2015" (p. 3)

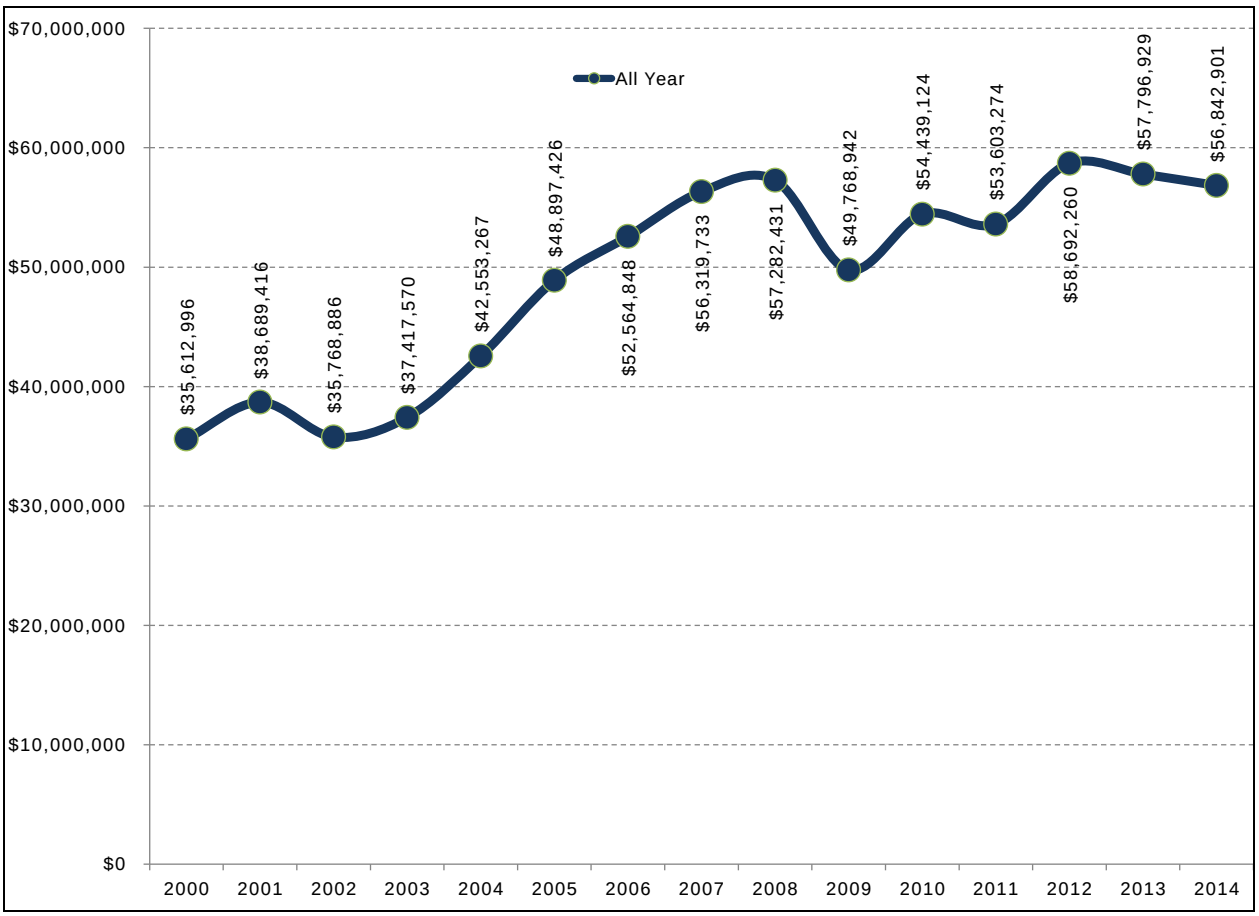
VISITOR INDUSTRY

Fairbanks is a gateway for travelers from Asia, Europe, and the continental United States. The proximity of Denali National Park has made Fairbanks a popular overnight destination for many cruise and tour companies. Additionally, Fairbanks is a popular gateway for tours into Alaska's Northern Region. While the majority of visitors arrive during the summer months, Fairbanks is succeeding in developing itself as a popular destination for winter tourism. Winter tourism in Fairbanks has benefited from the proximity of world-class cross-country skiing, snowmobiling, dog-mushing, winter festivals

and numerous hot springs. The World Ice Art Championships, held annually in March, draw artists and visitors from around the globe. Additionally, Fairbanks is one of the premier locations in Alaska for visitors viewing the Northern Lights.[28]

In 2014, hotel and motel operators generated $56,842,901 in receipts, almost half of which was collected during the Summer season, or $24,687,167. The on-set of the Great Recession in 2008 affected the visitor-serving industry, as total receipts generated by hotels and motel went from $57,282,431 in 2008 down to $49,768,942 the following year, and still below the 2008 figure in 2010, when total receipts were $54,439,124.

FIGURE 30
ANNUAL TRENDS IN TOTAL RECEIPTS GENERATED BY HOTELS AND MOTELS IN FNSB



[28] FNSB, "2011: Comprehensive Economic Development Strategy", page 38

FIGURE 31
ANNUAL TRENDS IN HOTEL AND MOTEL RECEIPTS GENERATED BY QUARTER

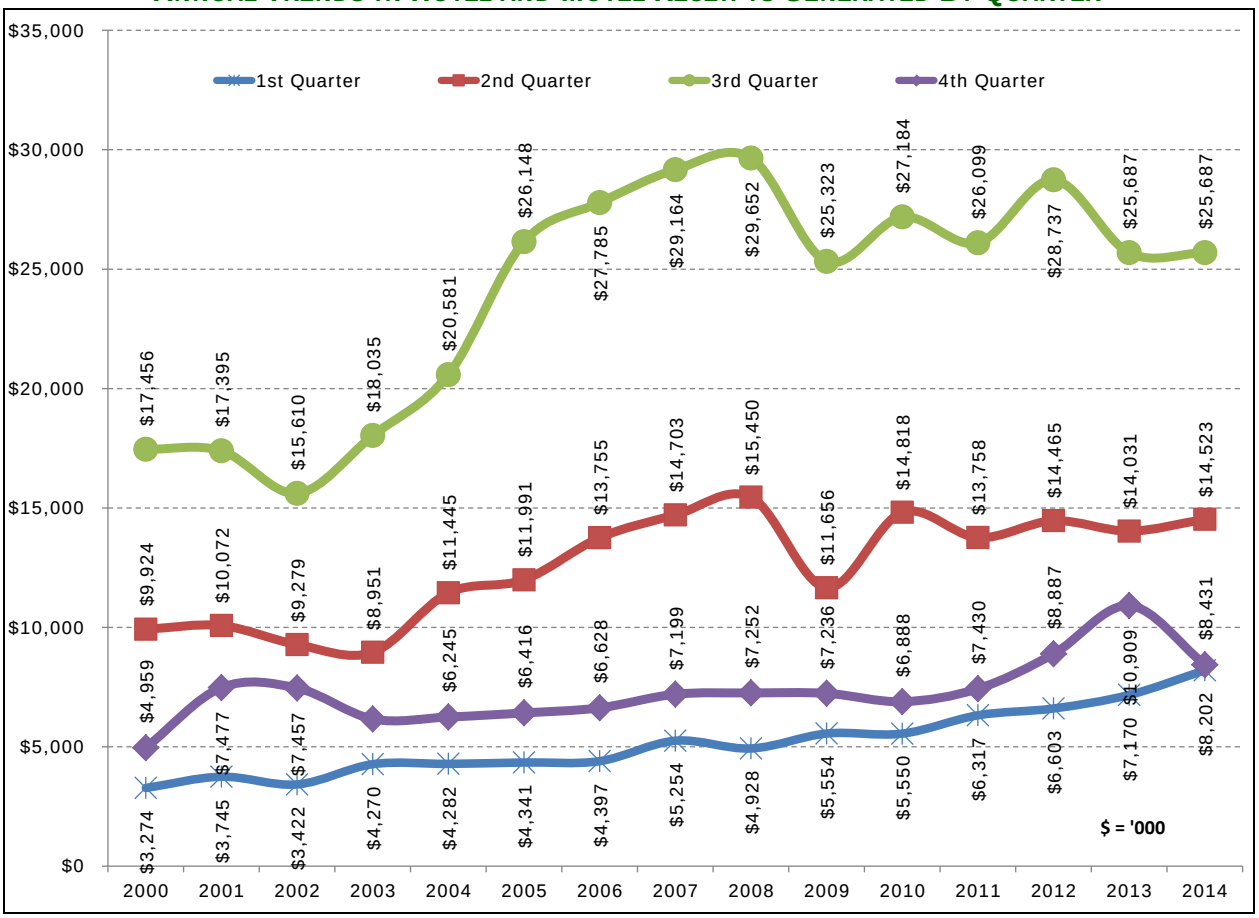
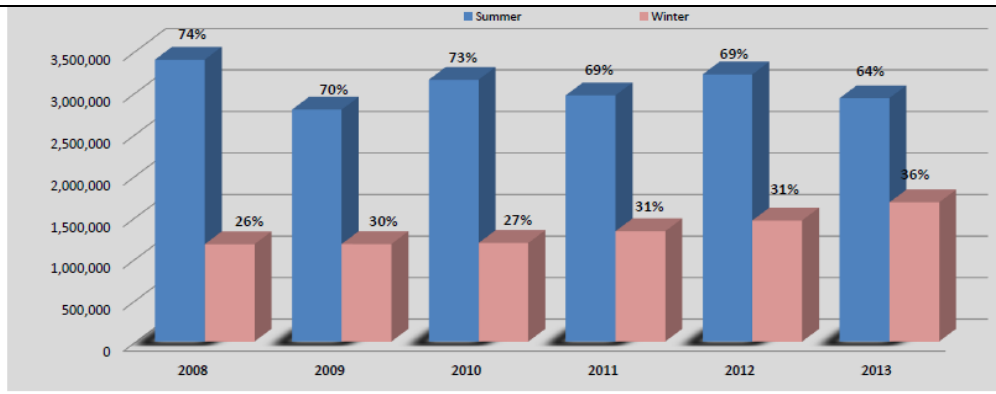


FIGURE 32
SEASONAL HOTEL REVENUES IN FNSB INCLUDING FAIRBANKS AND NORTH POLE CITY LIMITS



	2008		2009		2010		2011		2012		2013	
Summer	74%	$3,393,909	70%	$2,791,395	73%	$3,151,673	69%	$2,964,126	69%	3,215,865	64%	2,928,749
Winter	26%	$1,171,806	30%	$1,174,265	27%	$1,186,687	31%	$1,328,226	31%	1,458,245	36%	1,674,430
Total	100%	$4,565,715	100%	$3,965,660	100%	$4,338,360	100%	$4,292,352	100%	4,674,110	100%	4,603,179

While the State of Alaska annually issues a state of tourism report with detailed statewide data on tourism, every five years the State expands the annual report to include local tourism data. In the most current local report issued in 2012, the State reports that, of the 1,556,800 out-of-state Summer visitors to Alaska in 2011, 327,000 visited FNSB, or 21 percent of the total. Of the 266,800 out-of-state Fall\Winter visitors in 2011-2012, 51,000 visited FNSB, or 19 percent. Between 2006 and 2011, the number of Summer visitors dropped to 327,000 from 385,000.

TABLE 33
TRENDS IN THE NUMBER OF SUMMER AND WINTER/FALL OUT OF STATE VISITORS TO ALASKA AND SELECT DESTINATIONS IN ALASKA

	SUMMER		FALL\WINTER	
	2006	2011	06-07	11-12
Total Visitors to Alaska	1,638,737	1,556,800	249,500	266,800
Southeast	1,160,000	1,059,000	30,000	27,000
Juneau	1,034,000	950,000	15,000	13,000
South central	907,000	872,000	190,000	205,000
Anchorage	814,000	763,000	180,000	195,000
Interior	534,000	514,000	70,000	56,000
Denali	450,000	436,000	10,000	3,000
Fairbanks	*385,000*	*327,000*	*55,000*	*51,000*
Tok	80,000	62,000	2,000	3,000
Glennallen	69,000	47,000	2,000	3,000
Other Interior	62,000	62,000	12,000	8,000
Southwest	54,000	62,000	17,000	13,000
Kodiak	20,000	31,000	7,000	8,000
Other Southwest	38,000	31,000	10,000	5,000
Far North	49,000	31,000	12,000	16,000
Nome	11,000	16,000	2,000	5,000
Other Far North	41,000	31,000	10,000	11,000

Source: Applied Development Economics, based on Alaska Dept. of Commerce Division of Economic Development, "Alaska Visitor Statistics Programs VI" (Summer 2006 and 2011 reports)

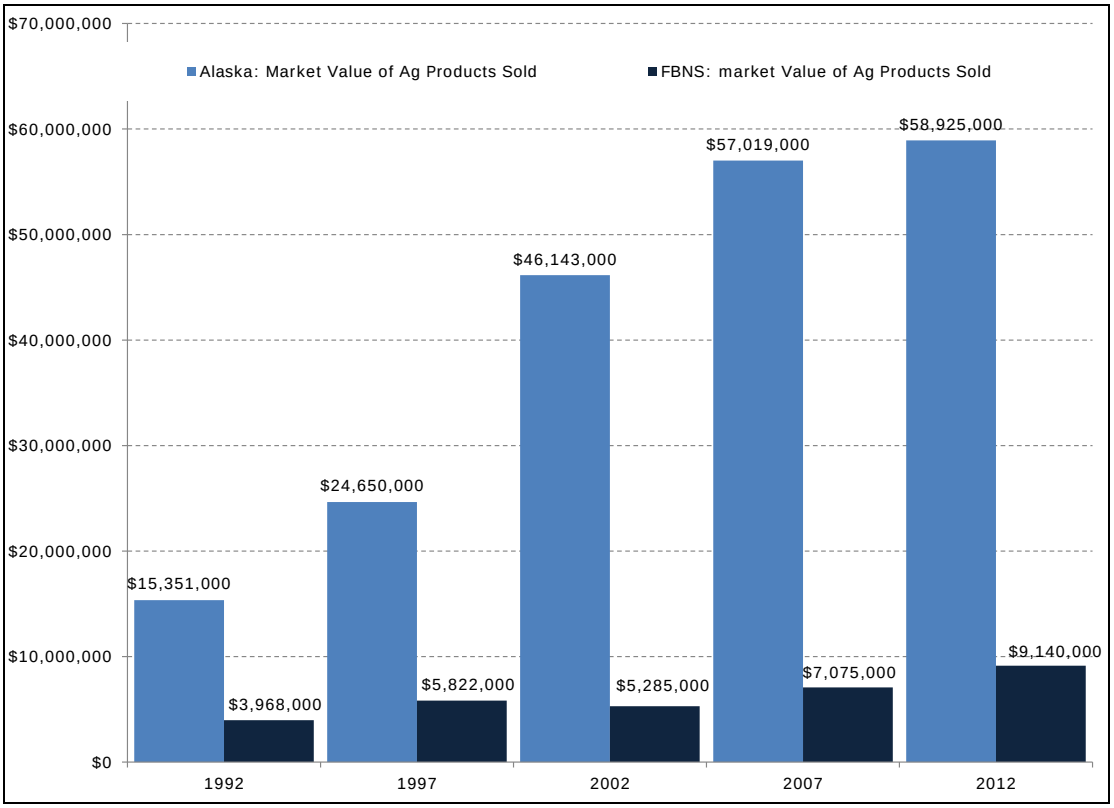
AGRICULTURE

Due to the climate and terrain of Alaska generally and parts of FNSB specifically, agriculture is not as prominent an economic sector as it is in other parts of the nation. Statewide, Alaska imports the bulk of its food. [29] However, the growing interest nationally in locally-grown produce and meats is also

[29] Future farming in Alaska http://bit.ly/1P6HKx6

taking hold in Alaska.[30] In the last decade, famers in the FNSB produced 15.5 percent of Alaska's agricultural products, or $9,140,000 out of $58,925,000. In 2012, local farmers harvested 53.4 percent of the total Alaskan harvested acreage (16,708 acres out of 31,315 acres).

FIGURE 33
COMPARISON OVER TIME OF TOTAL MARKET VALUE OF AGRICULTURAL PRODUCTS: FNSB VERSUS STATE OF ALASKA



The number of farms in the FNSB area, including the Tanana Valley, increased slightly by 0.5 percent a year between 2007 and 2012, from 212 to 217. In contrast, FNSB farms had increased in numbers by 2.4 percent a year from 2002 to 2007. Moreover, the number of farms across the state increased annually by 2.1 percent a year when comparing the two most recent Agricultural Censuses (2007 and 2012) produced by the USDA. Interestingly, the median size of farms in FNSB is 100 acres versus just 33 acres across the state.

[30] Kirk Johnson, "In a Tough Place to Farm, Discovering Much to Love: Alaska Turns to Locally Grown Food Thanks to State Incentives," New York Times, 31 August 2014, http://nyti.ms/1OQSUW0 (accessed 15 July 2015)

TABLE 34
AGRICULTURAL TRENDS: ALASKA AND FAIRBANKS NORTH STAR BOROUGH (1992 - 2012)

	1992	1997	2002	2007	2012	92-02 CAGR	02-07 CAGR	07-12 CAGR
Alaska: Farms	512	548	609	686	762	1.8%	2.4%	2.1%
Land in farms (acres)	923,037	881,045	900,715	881,585	833,861	-0.2%	-0.4%	-1.1%
Median size of farms (acres)		107	81	60	33		-5.8%	-11.3%
Total farms with cropland	419	434	479	512	561	1.3%	1.3%	1.8%
Tot farms harvested cropland	352	381	393	424	495	1.1%	1.5%	3.1%
Harvested cropland (acres)	22,699	34,227	31,824	30,772	31,315	3.4%	-0.7%	0.4%
Market value of AG products sold	$15,351,000	$24,650,000	$46,143,000	$57,019,000	$58,925,000	11.6%	4.3%	0.7%
FNSB: Farms	168	179	187	212	217	1.1%	2.5%	0.5%
Land in farms (acres)	141,338	118,836	109,990	110,780	99,620	-2.5%	0.1%	-2.1%
Median size of farms (acres)		200	181	133	100		-6.0%	-5.5%
Total farms with cropland	144	161	171	185	182	1.7%	1.6%	-0.3%
Tot farms harvested cropland	119	141	130	144	151	0.9%	2.1%	1.0%
Harvested cropland (acres)	10,202	19,514	16,050	16,834	16,708	4.6%	1.0%	-0.2%
Market value of AG products sold	$3,968,000	$5,822,000	$5,285,000	$7,075,000	$9,140,000	2.9%	6.0%	5.3%
Fairbanks As Share of Alaska	**1992**	**1997**	**2002**	**2007**	**2012**			
Farms	32.8%	32.7%	30.7%	30.9%	28.5%			
Land in farms (acres)	15.3%	13.5%	12.2%	12.6%	11.9%			
Median size of farms (acres)		186.9%	223.5%	221.7%	303.0%			
Total farms with cropland	34.4%	37.1%	35.7%	36.1%	32.4%			
Tot farms harvested cropland	33.8%	37.0%	33.1%	34.0%	30.5%			
Harvested cropland (acres)	44.9%	57.0%	50.4%	54.7%	53.4%			
Market value of AG products sold	25.8%	23.6%	11.5%	12.4%	15.5%			

Source: Applied Development Economics, based on US Census Agricultural Census 1992, 1997, 2002, 2007, and 2012

ALASKA NATIVE CORPORATIONS

Alaska Native Corporations play an important role in the FNSB economy. These corporations own, operate, and manage various development projects and businesses in the FNSB and statewide. Additionally, several Alaska Native Regional Corporations operate corporate subsidiaries in the FNSB. These Native Corporations include Ahtna Inc., Arctic Slope Regional Corporation, Bristol Bay Native Corporation, Calista Corporation, Chugach Alaska Corporation, Cook Inlet Region Inc., Doyon LTD, and NANA Regional Corporation. Regional and Village corporations serve their shareholders through dividends, workforce training, employment opportunities, charitable contributions, and social and cultural leadership.[31]

The FNSB Community Research Center has culled information on numerous Alaska Native Regional Corporations. These entities generated $7,924,000,000 in revenues in 2013, with the FNSB-based Doyon generating $319,000,000 of that amount. Revenues for Doyon increased by one percent a year between 2008 and 2013, although for the pool of regional corporations analyzed by the Community Research Center, revenues increased annually by six percent over the same period.[32]

[31] FNSB, "2011: Comprehensive Economic Development Strategy", pages 39 and 40

[32] It is important to note that revenue amounts indicated here are for economic activity occurring throughout Alaska, not just for activity occurring in FNSB.

TABLE 35

ANNUAL TRENDS IN REVENUES ($000,000) GENERATED BY ALASKA NATIVE CORPORATIONS*

	NATIVE REGIONAL CORPORATIONS	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	01-08	08-13
BUSINESS IN OR BASED IN FNSB	Arctic Slope Regional Corp.	$1,062	$974	$1,029	$1,330	$1,587	$1,751	$1,842	$2,297	$1,945	$2,332	$2,550	$2,600	$2,526	12%	2%
	Doyon Ltd.	$60	$57	$142	$161	$172	$222	$281	$306	$309	$459	$468	$338	$319	26%	1%
	Ahtna Inc.	$63	$66	$70	$84	$95	$110	$136	$196	$231	$200	$243	$189	$200	18%	0%
	Calista Corp.	$17	$29	$46	$49	$57	$95	$138	$224	$224	$231	$301	$404	$404	45%	13%
	Bristol Bay Native Corp.	$132	$187	$0	$0	$0	$1	$1	$1,295	$1,392	$1,667	$1,966	$1,965	$1,836	39%	7%
OUTSIDE OF FNSB	NANA Regional Corp.	$173	$202	$263	$331	$527	$806	$976	$1,176	$1,258	$1,600	$1,800	$1,800	$1,700	32%	8%
	Cook Inlet Region Inc.	$854	$95	$83	$85	$98	$208	$133	$11	$80	$188	$201	$238	$215	-46%	81%
	Sealaska Corp.	$145	$170	$177	$152	$144	$179	$203	$126	$201	$223	$260	$312	$165	-2%	6%
	Koniag Inc.	$31	$71	$102	$148	$146	$148	$128	$101	$116	$150	$131	$127	$202	18%	15%
	The Aleut Corporation	$79	$61	$49	$64	$96	$120	$157	$116	$146	$144	$159	$116	$116	6%	0%
	Bering Straits Native Corp.	$96	$10	$14	$17	$22	$43	$76	$113	$162	$190	$206	$213	$242	2%	16%
	The 13th Regional Corp.	$11	$21	$11	$31	$9	$10	NA	NA	NA	NA	NA	NA	NA		
	All	**$2,722**	**$1,942**	**$1,987**	**$2,451**	**$2,953**	**$3,691**	**$4,071**	**$5,962**	**$6,063**	**$7,383**	**$8,284**	**$8,302**	**$7,924**	**12%**	**6%**

*Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (Spring 2003, 2006, 2009, and 2015). *Note: revenue amounts indicated are for economic activity occurring throughout Alaska, not just FNSB.*

DOYON LIMITED (DOYON)

Of the number of Alaska Native Regional Corporations operating in the state, Doyon Limited, an Interior Native Regional Corporation, is headquartered in Fairbanks. Doyon is regularly listed as one of the state's top 49 Alaskan owned and operated businesses. Doyon is the largest private landowner in Alaska with 12.5 million acres of land in Interior Alaska and has over 18,000 shareholders. Under the provisions of the Alaska Native Claims Settlement Act (ANCSA) Doyon would receive approximately 12.5 million acres across Interior Alaska. To date Doyon has received title to nearly 10 million acres, primarily around the 34 villages within the region. Management of Doyon lands is focused on protection of traditional shareholder uses, and responsible economic development of natural resources. Doyon operates several businesses and foundations in Fairbanks which include: Doyon Oil Field Services: drilling operations, security, remote camp services, engineering and consulting, and pipeline construction; Government Services: security, logistics, project services, communications, program management, and technical services; Tourism: Kantishna Roadhouse and Wilderness, Denali River Cabins, Doyon/ARAMARK; and Subsidiaries: Cherokee General Corporation, D.C. Metro, Doyon Facilities, Doyon Universal Services (DUS), and Doyon Utilities. Over the past 25 years Doyon has entered into a number of exploration ventures to determine mineral development potential on Doyon lands. In addition to precious and base metals exploration, Doyon's natural resources program includes sand, gravel and quarry rock sales. Doyon is also involved in development of oil, gas and coal resources, as well as forestry. [33]

[33] FNSB, "2011: Comprehensive Economic Development Strategy", pages 39 and 40

3. INDUSTRY CLUSTERS

INTRODUCTION

Economic development practitioners and policymakers are increasingly turning to the industry cluster approach to foster sustainable economic development. Local and state officials have also been supported in their efforts at fostering industry clusters by the US Department of Commerce, which has recently institutionalized the cluster approach within the EDA through its Cluster Mapping Project (http://bit.ly/1gKJJvS). In short, a cluster is a regional concentration of related industries in a particular location. Clusters consist of companies, suppliers, and service providers, as well as government agencies and other institutions that provide specialized training and education, information, research, and technical support. By working together as an industry cluster, officials, service-providers and employers hope to create more jobs and generate more sales at levels they could not achieve by working separately and/or alone.

The purpose of this section of the report is to identify the most competitive economic sectors in FNSB. We utilize the quadrant analysis approach to identify sets of FNSB economic sectors that performed well with regard to two indicators. The first indicator sheds light on which sectors are more concentrated in FNSB relative to the nation as a whole. The second indicator sheds light on which FNSB sectors grew faster than similar sectors at the national level. Sectors that score well on both indicators – those that simultaneously are more concentrated in FNSB relative to how they are concentrated nationally and grew faster than comparable sectors nationally – are the sectors for which officials should devise an industry cluster approach. In an effort to confirm the sectors identified through the quadrant analysis, we further scrutinize these sectors via a shift-share analysis.

INDUSTRY CLUSTERS BASED ON QUADRANT ANALYSIS

There are 46,188 private and public sector jobs across various sectors in the FNSB. The amount of jobs in FNSB in 2014 is slightly more than the amount in 2008, at 45,078 jobs, when the Great Recession was beginning The following are the top-five industries in terms of employment: Active Military (7,403 or 16 percent), Educational Services (6,156 or 13.3 percent), Total Government [Federal, State, and Local] (5,380 or 11.6 percent), Retail (4,678 or 10.1 percent), and Health Care (4,389 percent or 9.5 percent). The Health Care total includes those working at the Bassett Community Hospital at Fort Wainwright, particularly because this is a facility that military retirees living in FNSB utilize. The Educational Services total includes persons working in private educational facilities, as well as persons working at the Fairbanks North Star Borough School District, the Yukon Koyukuk School District, and the University of Alaska Fairbanks. Key economic base sectors such as Mining and Accommodations employ 1,429 (3.1 percent of total) and 1,095 (2.4 percent of total) workers respectively. The number of jobs in the Mining sector grew by five percent a year from 2008 to 2014. Military is also an economic base industry, and this industry grew by 2.5 percent between 2008 and 2014.

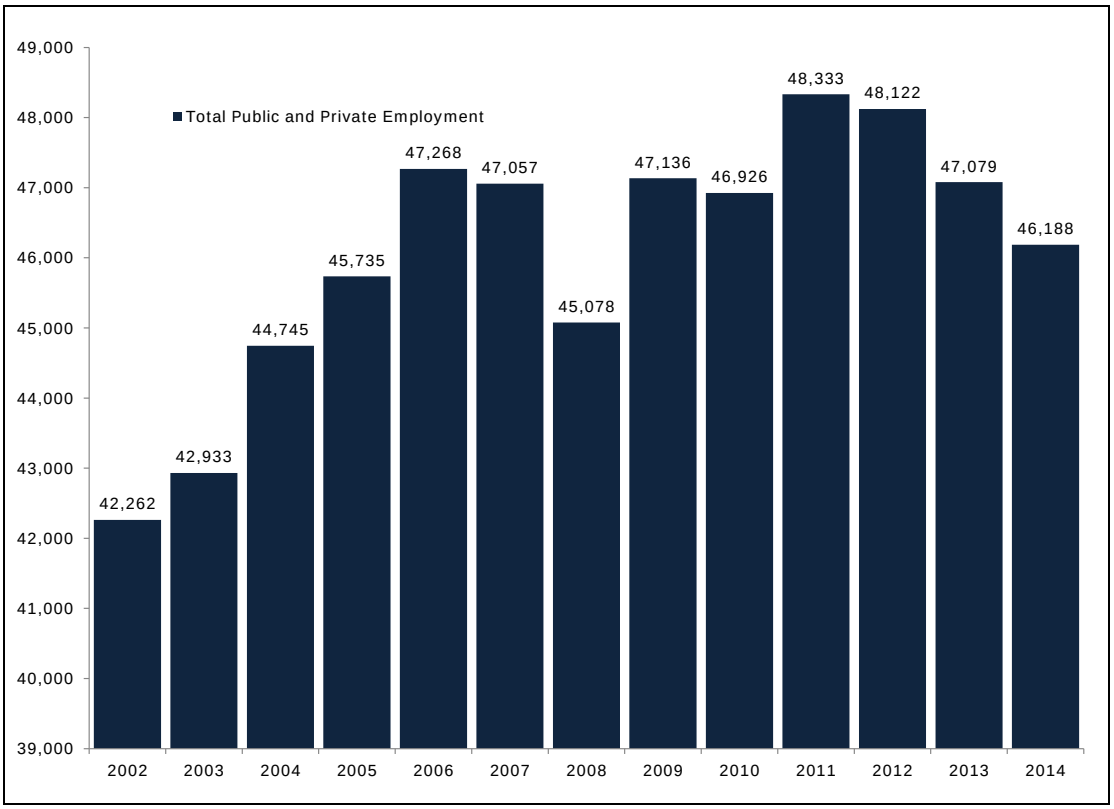
TABLE 36

ANNUAL TRENDS IN PUBLIC AND PRIVATE EMPLOYMENT BY ECONOMIC SECTORS: FAIRBANKS NORTH STAR BOROUGH

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2014	04-08 CAGR	08-14 CAGR
TOTAL PUBLIC AND PRIVATE EMPLOYMENT	**44,745**	**45,735**	**47,268**	**47,057**	**45,078**	**47,136**	**46,926**	**48,333**	**48,122**	**47,079**	**46,188**	**100%**	**0.2%**	**0.4%**
Active Military*	7,413	7,425	8,727	8,415	6,399	8,868	7,823	8,903	8,385	7,803	7,403	16.0%	-3.6%	2.5%
Educational Services**	6,398	6,426	6,447	6,487	6,522	6,295	6,546	6,382	6,292	6,338	6,156	13.3%	0.5%	-1.0%
Total Government***	5,156	5,180	5,220	5,300	5,330	5,590	5,673	5,771	5,543	5,432	5,380	11.6%	0.8%	0.2%
Retail Trade	4,359	4,649	4,671	4,656	4,658	4,537	4,551	4,659	4,734	4,643	4,678	10.1%	1.7%	0.1%
Health Care^	3,508	3,618	3,754	3,754	3,846	3,818	3,868	3,913	4,346	4,413	4,389	9.5%	2.3%	2.2%
Eating, Drinking Places	2,560	2,527	2,605	2,777	2,653	2,591	2,671	2,691	2,672	2,636	2,649	5.7%	0.9%	0.0%
Construction	2,776	2,911	2,764	2,756	2,765	2,490	2,641	2,596	2,618	2,431	2,557	5.5%	-0.1%	-1.3%
Transport and Warehsng	2,240	2,226	2,097	2,038	2,029	2,141	2,020	2,016	2,077	2,018	1,947	4.2%	-2.4%	-0.7%
Mining	948	1,178	1,300	1,116	1,058	1,068	1,117	1,282	1,468	1,441	1,429	3.1%	2.8%	5.1%
Professional, Science, Tech.	1,079	1,067	1,024	1,089	1,197	1,300	1,515	1,539	1,494	1,472	1,319	2.9%	2.6%	1.6%
Other Services	1,318	1,361	1,317	1,287	1,245	1,251	1,116	1,132	1,183	1,151	1,130	2.4%	-1.4%	-1.6%
Accommodation	1,192	1,131	1,024	1,061	1,051	927	969	1,029	1,074	1,089	1,095	2.4%	-3.1%	0.7%
Social Assistance	923	934	889	842	880	1,066	1,307	1,307	1,064	1,099	1,064	2.3%	-1.2%	3.2%
Admin, Support Services	896	939	948	1,014	1,015	727	722	766	816	750	754	1.6%	3.2%	-4.8%
Wholesale Trade	589	633	652	663	652	656	654	661	705	735	745	1.6%	2.6%	2.2%
Finance and Insurance	743	800	834	875	894	887	877	799	805	784	688	1.5%	4.7%	-4.3%
Real Estate and Leasing	569	602	741	722	641	671	676	647	622	632	621	1.3%	3.0%	-0.5%
Manufacturing	565	622	632	653	649	639	604	575	556	616	602	1.3%	3.5%	-1.2%
Arts, Entertainment, Rec.	473	478	481	478	457	483	445	409	443	455	467	1.0%	-0.9%	0.4%
Information	576	575	593	564	588	533	497	549	548	485	456	1.0%	0.5%	-4.1%
Utilities	288	297	325	317	362	404	418	424	394	394	390	0.8%	5.9%	1.2%
Mgmt. of Companies	36	48	51	40	49	57	53	120	118	122	123	0.3%	7.7%	16.8%
Waste Mgmt / Rem.	91	62	75	81	86	90	79	86	89	59	57	0.1%	-1.5%	-6.5%
Unclassified	17	13	52	36	11	7	39	29	27	33	49	0.1%	-10.3%	28.3%
Agric, Forestry, Hunting	32	33	45	36	42	40	45	48	49	48	40	0.1%	7.0%	-0.8%

*Source: Applied Development Economics, based on State of Alaska, Department of Labor, Research and Analysis (QCEW Data 2002 through 2014 [http://bit.ly/1SlwodY]) (notes: * Active Duty military excludes active duty military at Ft. Wainwright Basset Community Hospital / ** Educational Services includes private sector and public sector employees, including UAF /*** Total Government includes federal, state, and local workers, excluding those in public education and excluding civilian workers at Ft. Wainwright Basset Community Hospital (who are counted in "Health Care") / ^ Health Care includes estimated number of active duty military and civilians working at Ft. Wainwright Basset Community Hospital). Note CAGR = compound annual growth rates.*

FIGURE 34
ANNUAL TRENDS IN TOTAL PUBLIC AND PRIVATE SECTOR EMPLOYMENT: FAIRBANKS NORTH STAR BOROUGH



While total private and public sector employment in FNSB grew by 3.2 percent annually from 2008 to 2014, in the nation as a whole, total employment grew at a tepid annual pace of 0.4 percent. Nationally, the number of active military personnel went down by 0.6 percent annually, from 1,401,757 to 1,354,054. Comparing the employment number for FNSB by sectors and industries against similar sectors and industries nationally allows us to calculate "relative shift" and "location quotient" figures. Location quotient is a numeric value of the extent to which employment in a given industry and area is concentrated in that area, relative to the way employment in the same industry is concentrated in a comparison area. Thus, military active duty personnel are 17.2 times more concentrated in FNSB than in the national economy. Mining is another sector that is highly concentrated in FNSB relative to the way Mining is concentrated nationally. The degree to which Mining sector jobs is a part of FNSB's economy is five times greater than the level in the national economy. Relative shift refers to whether FNSB industries and sectors are not only growing but also growing at rates faster than the national rate for similar industries and sectors.

TABLE 37

COMPARING EMPLOYMENT TRENDS: FAIRBANKS NORTH STAR BOROUGH VERSUS USA

	FNSB				USA				QUADRANT ANALYSIS	
	2008	2014	DISTRIBU-TION	08-14 CAGR	2008	2014	DISTRIBUTION	08-14 CAGR	RELATIVE SHIFT	LOCATION QUOTIENT
Total Public and Private Emp	45,067	46,139	100%	0.39%	136,001,065	137,735,333	100%	0.40%		
Military Active Duty	6,399	7,403	16.0%	2.46%	1,401,757	1,354,054	1.00%	-0.60%	0.191	16.321
Educational Services	6,522	6,156	13.3%	-0.96%	2,366,800	2,667,810	1.90%	2.00%	-0.183	6.888
Health Care, Social Assistance	4,726	5,453	11.8%	2.41%	15,587,303	17,898,174	13.00%	2.30%	0.006	0.910
Total Govt (excl. active mil.)	5,330	5,380	11.7%	0.16%	21,619,194	21,047,729	15.30%	-0.40%	0.036	0.763
Retail Trade	4,658	4,678	10.1%	0.07%	15,307,933	15,348,167	11.10%	0.00%	0.002	0.910
Food Svc and Drinking Places	2,653	2,649	5.7%	-0.03%	9,558,106	10,643,336	7.70%	1.80%	-0.115	0.743
Construction	2,765	2,557	5.5%	-1.29%	7,124,886	6,106,206	4.40%	-2.50%	0.068	1.250
Transportation & Warehsng	2,029	1,947	4.2%	-0.69%	4,271,969	4,388,179	3.20%	0.40%	-0.068	1.325
Mining	1,058	1,429	3.1%	5.14%	713,398	841,854	0.60%	2.80%	0.171	5.067
Professional, Sci., Tech.	1,197	1,319	2.9%	1.63%	7,816,999	8,346,802	6.10%	1.10%	0.034	0.472
Other Services	1,245	1,130	2.4%	-1.60%	4,484,907	4,233,339	3.10%	-1.00%	-0.036	0.797
Accommodation	1,051	1,095	2.4%	0.69%	1,858,911	1,883,340	1.40%	0.20%	0.029	1.736
Admin. and Support Services	1,015	754	1.6%	-4.83%	7,636,207	8,185,179	5.90%	1.20%	-0.329	0.275
Wholesale Trade	652	745	1.6%	2.25%	5,954,915	5,817,072	4.20%	-0.40%	0.166	0.382
Finance and Insurance	894	688	1.5%	-4.27%	5,857,197	5,634,513	4.10%	-0.60%	-0.192	0.365
Real Estate, Rental, Leasing	641	621	1.3%	-0.53%	2,111,179	2,040,591	1.50%	-0.60%	0.002	0.908
Manufacturing	649	602	1.3%	-1.25%	13,382,697	12,154,235	8.80%	-1.60%	0.019	0.148
Arts, Entertainment and Rec	457	467	1.0%	0.36%	1,978,461	2,094,295	1.50%	1.00%	-0.037	0.666
Information	588	456	1.0%	-4.15%	2,989,161	2,731,690	2.00%	-1.50%	-0.138	0.498
Utilities	362	390	0.8%	1.25%	557,983	549,142	0.40%	-0.30%	0.093	2.120
Mgmt. of Companies & Ent.	49	123	0.3%	16.58%	1,895,417	2,153,957	1.60%	2.20%	1.374	0.170
Waste Management	86	57	0.1%	-6.63%	356,656	385,565	0.30%	1.30%	-0.418	0.441
Agric., Forestry, Hunting	42	40	0.1%	-0.81%	1,169,029	1,230,105	0.90%	0.90%	-0.100	0.097

Source: Applied Development Economics, based on State of Alaska, Department of Labor, Research and Analysis (QCEW Data 2002 through 2014 [http://bit.ly/1SlwodY])

Below we rank FNSB industries and sectors by their location quotient (LQ) and relative share (RS) figures, in an effort to create a list of sectors that might be part of any industry cluster strategy. Prior to scoring each industries' respective LQ and RS figures, we remove local support industries from consideration, as progress in these industries and sectors – Retail, Education, Healthcare, Utilities, etc. – is a function of economic base industries and demographic changes. Moreover, to warrant consideration, sectors must also have an LQ score of at least 1.25, so as to focus attention on those sectors that are the most concentrated in FNSB relative to the nation. Industries must also exhibit a positive RS. Five sectors and industries met these criteria. These are Military Active Duty, Mining, Construction, Accommodations, and Transportation and Warehousing. Transportation and Warehousing scored an overall "1" because while its LQ was above 1.25 at 1.325, this sector had a negative RS. The four other target industries scored "2" for having satisfied the LQ and RS criteria.

TABLE 38
QUADRANT ANALYSIS

	QUADRANT ANALYSIS				
	RELATIVE SHIFT	RELATIVE SHIFT SCORE (IF RS>0, THEN 1)	LOCATION QUOTIENT	LOCATION QUOTIENT SCORE (IF LQ > 1.25, THEN 1)	COMBINED SCORE
Military Active Duty	0.191	1	16.132	1	2
Mining	0.171	1	5.067	1	2
Construction	0.068	1	1.250	1	2
Accommodation	0.029	1	1.736	1	2
Transportation and Warehousing	-0.068		1.325	1	1
Utilities	0.093		2.120		
Total Govt. (excl. active military)	0.036		0.763		
Retail Trade	0.002		0.910		
Real Estate, Rental and Leasing	0.002		0.908		
Health Care and Social Assistance	0.006		0.910		
Other Services	-0.036		0.797		
Food Services and Drinking Places	-0.115		0.743		
Arts, Entertain., and Recreation	-0.037		0.666		
Information	-0.138		0.498		
Professional, Scientific, Tech.	0.034		0.472		
Waste Management/Remediation	-0.414		0.441		
Wholesale Trade	0.166		0.382		
Finance and Insurance	-0.192		0.365		
Administrative and Support Svc.	-0.329		0.275		
Educational Services	-0.183		6.888		
Mgmt. of Companies & Enterprises	1.400		0.170		
Manufacturing	0.019		0.148		
Agric., Forestry, Fishing, Hunting	-0.100		0.097		

Source: Applied Development Economics

CONFIRMING INDUSTRY CLUSTERS VIA SHIFT-SHARE ANALYSIS

In an effort to confirm the target industries identified via the quadrant analysis, we further scrutinized FNSB's jobs data via a shift-share analysis. Shift-share is a standard regional analysis method that attempts to determine how much of regional job growth can be attributed to national trends, and how much is due to unique regional factors. Shift-share helps answer why employment is growing or declining in a regional industry, cluster, or occupation.[34]

TABLE 39
FAIRBANKS NORTH STAR SHIFT-SHARE ANALYSIS

	Sectoral Trends Analysis			Shift Share Analysis			
	2008	2014	08-14 Chang	Nat'l Share	Industry Mix	Regional Shift	Total Change
To. Public and Private Emp.	38,256	38,324	68	506	-104	-334	68
Military Active Duty	6,811	7,815	1,004	90	-322	1,236	1,004
Health Care and Soc. Assistance	4,226	4,953	727	56	571	100	727
Mining	1,058	1,429	371	14	176	180	371
Professional, Scientific, Tech.	1,197	1,319	122	16	65	41	122
Wholesale Trade	652	745	93	9	-24	108	93
Mgmt. of Comp. & Enterprises	49	123	75	1	6	68	75
Educational Services	6,522	6,156	-366	86	143	-1,195	-366
Accommodation	1,051	1,095	44	14	0	30	44
Utilities	362	390	28	5	-11	34	28
Retail Trade	4,658	4,678	20	62	-49	8	20
Arts, Entertain., and Recreation	457	467	10	6	21	-17	10
Agric., Forestry, Fishing, Hunting	42	40	-2	1	2	-4	-2
Food Services, Drinking Places	2,653	2,649	-4	35	266	-305	-4
Real Estate, Rental and Leasing	641	621	-20	8	-30	1	-20
Waste Management/Remediation	86	57	-29	1	6	-35	-29
Manufacturing	649	602	-47	9	-68	13	-47
Transportation and Warehousing	2,029	1,947	-82	27	28	-137	-82
Other Services	1,245	1,130	-115	16	-86	-45	-115
Information	588	456	-132	8	-58	-81	-132
Finance and Insurance	894	688	-206	12	-46	-172	-206
Construction	2,765	2,557	-208	37	-432	187	-208
Administrative, Support Services	1,015	754	-261	13	60	-334	-261
Total Govt. (excl. active military)	5,330	5,380	50	71	-209	188	50

Source: Applied Development Economics

[34]EMSI, "Understanding Shift-Share" (http://bit.ly/1ORuoEj) Accessed on 1 August 2015

Below we summarize our interpretation of the shift-share analysis. The shift-share analysis and interpretation confirm the selection of four out of five sectors and industries. The one sector that was not confirmed by the shift-share analysis is Transportation and Warehousing. Per the shift-share analysis, the Transportation and Warehousing Sector should have increased in the number of new jobs, although in actuality it declined.

TABLE 40
USING THE SHIFT-SHARE ANALYSIS TO CONFIRM INDUSTRY CLUSTERS OBTAINED VIA QUADRANT ANALYSIS

CLUSTER INDUSTRY TARGETS VIA QUADRANT ANALYSIS	SHIFT-SHARE ANALYSIS AND DISCUSSION
Military	Had the active military population in FNSB changed in accordance alone with military changes at the national level, there would have been 300 less personnel. The actual increase between 2008 and 2014 of over 1,000 active military population locally reflects a comparative advantage unique to FNSB. This advantage may lie in the proximity of Alaska to evolving national security risks and challenges the US faces in the Pacific Ocean. In other words, while the US military can cut forces elsewhere, they must maintain if not increase forces in FNSB due to possible threats from Russia, China, and North Korea. The shift-share analysis confirms this as a target industry.
Mining	Had employment in the Mining sector followed national Mining sector trends alone, employment would have increased by 170 plus workers. Of the 370 actual new mining jobs in FNSB, according to the shift-share analysis, 180 is attributable to local conditions, meaning that local conditions account for as much as national industry changes — at 180 versus 170 — in the overall increase of 370 new jobs. While the Mining sector grew locally because of national trends — as in "a rising tide lifts all boats" — the increase of 180 jobs attributable to local factors reflects FNSB's comparative advantage with regard to its proximity to resource-rich North Slope and interior Alaska regions. The shift-share analysis confirms this as a target industry.
Accommodations	Had this sector only changed in accordance with what occurred nationally, there would have been no increase in jobs in FNSB in this sector. The fact that the actual number of jobs increased somewhat by over 40 jobs since the Great Recession suggests that FNSB was somewhat buffered against the slight headwinds faced by this sector nationally over the same period. This advantage lies in FNSB's proximity to interior Alaska's natural wonders that draws visitors from throughout the globe, including the United States. The shift-share analysis confirms this as a target industry.
Construction	Nationally, this sector declined significantly, such that had national industry conditions applied only, construction jobs in FNSB would have dropped by over 430 workers. While the amount of actual construction jobs declined by over 250 between 2008 and 2014, this indicates that extenuating factors cushioned FNSB against larger headwinds affecting construction nationally that would have resulted in even worse job loss numbers. Perhaps what explains the slower rate of decline is the fact the FNSB is a staging ground for construction-related work

Cluster Industry Targets Via Quadrant Analysis	Shift-Share Analysis and Discussion
	occurring in- and outside of FNSB, particularly as construction work is related to mining and pipeline construction. The shift-share analysis confirms this as a target industry.
Transportation and Warehousing	Had employment in this sector increased at the rate at which employment in this sector nationally grew (or by 0.4 percent per year), there would have been 28 new jobs. However, the actual number of jobs in this sector declined by 80 jobs, with the shift-share analysis attributing job losses largely to local conditions. The 80 new jobs via the industry-mix portion of the shift-share analysis was off-set by the loss of 137 jobs via the regional shift portion of the shift-share analysis, resulting in the total job change of -82 jobs. Based on stakeholder interviews, these jobs losses appear to be due in part to competitive pressures as other areas in the state capture more distribution business. However, it is worth noting that, outside of FNSB, employment in this sector also declined somewhat between 2008 and 2014 (-0.6 percent per year for Alaska-excluding FNSB and -0.7 percent per year for FNSB).

One economic base sector not on the initial list of target industries that officials might still consider is Manufacturing. Although FNSB has disadvantages for this sector related to energy prices and climate, future development of alternative energy systems technologies may create new opportunities.

AGGREGATED INDUSTRY CLUSTER EMPLOYMENT

The industry clusters have been expanded to include a more comprehensive definition of core cluster employment as well as related support industries (Table 41). In addition, we have added oil and gas support as a cluster. While we have attempted to include support industries, we have not included all multiplier effects from the clusters, which would include retail and local services supported by employee expenditures. The support activities in Table 41 reflect business to business transactions with cluster core industries. Based on this approach, however, cluster industries support more than half of all employment in the Borough.

TABLE 41 SUMMARY OF EMPLOYMENT IN INDUSTRY CLUSTERS, FNSB 2014

CLUSTERS	JOBS
Total All Clusters	**24,846**
Military Cluster	**12,328**
Active Duty Military*	7,815
Civilians Employed At Military Facilities	1,668
Support Services	2,845
Tourism Cluster	**4,995**
Food Services and Drinking Places	2,649
Accommodation	1,095
Rail	100
Air Transportation	506
Amusements, Gambling, Recreation	378
Scenic and Sightseeing	178
Performing Arts	71
Museums, Zoos, Parks, etc.	18
Construction Cluster	**3,045**
Construction of Buildings	695
Water and Sewer Line and Related Structures Construction	28
Power and Communication Line and Related Construction	20
Land Subdivision	6
Highway, Street, and Bridge Construction	255
Specialty Trade Contractors	2,030
Lumber/Construction Materials Merchant Wholesalers	11
Transportation Cluster	**2,399**
Air Transportation	487
Alaska Rail Road Corporation	445
Water Transportation	6
Trucking	1,281
Support Activities	180
Mining Cluster	**1,492**
Mining (except oil and gas)	1,271
Support Activities	221
Oil and Gas Support (Energy) Cluster	**588**
Oil/Gas/Coal Extraction	76
Support Activities for Petroleum Extraction	109
Oil and Gas Pipeline Construction	111
Petroleum Refineries	186
Petroleum Bilk Stations/Terminals/Wholesale	70
Pipeline Transportation of Crude Oil	36

*Source: Applied Development Economics. *Note: Active Duty Military include military personnel at Ft. Wainwright Basset Community Hospital*

4. FACTORS AFFECTING ECONOMIC PERFORMANCE

Based on the economic assessment presented above, a number of factors directly affect economic performance in the FNSB directly and indirectly.

MAIN FACTORS THAT RELATE TO ECONOMIC PERFORMANCE:

Below are a set of key factors that directly relate to economic performance in the FNSB. These factors are the foundation upon which the health of any region's economy rests. Attributes of a healthy, well-performing economy include a well-educated workforce, sources of new ideas and innovations, a smoothly-running industry supply-chain, and a public sector delivering the right amount of municipal services conducive to economic growth and well-being.

WORKFORCE

- FNSB has a higher proportion of younger and prime working age population than Alaska as a whole, perhaps in part due to the military and University of Alaska Fairbanks' presence in the Borough.

- The FNSB population has a relatively high educational attainment, with 32.8 percent earning a Bachelor's Degree or above compared to 28 percent for Alaska as a whole. The presence of UAF is a major educational asset in the region.

- Population and labor force have declined slightly between 2013 and 2014. However, State of Alaska projections suggest that FNSB will continue to grow over the long term.

INNOVATION ASSETS

- The UAF provides a wide range of education and research assets that can be leveraged for local economic development. Cold weather research and testing has been a prominent area of research. Currently, EDA has funded a major research project for micro-grid technology, which is researching technologies to integrate sustainable energy sources into small self-contained power grids. This technology has world-wide implications and can become an export industry with further development.

- In addition to these programs, the Fairbanks Economic Development Corporation sponsors a Technology Led Development program, including the Knowledge Industry Network (KIN) and several entrepreneurship resources.

INDUSTRY SUPPLY CHAINS

- FNSB serves as a transportation hub for Central Alaska with significant air, rail and road facilities. While Airline passenger transportation to Fairbanks has recovered from the recession, air cargo dropped significantly and has not recovered since 2008.

- Passenger volumes on the Alaska Rail Road to FNSB have also not recovered to 2008 levels. In addition, the conversion of the North Pole refinery from a production facility to a distribution facility has reduced petroleum shipping on the Alaska Rail Road and reversed the direction from going south to coming north.

- With the potential for a natural gas pipeline from the North Slope, additional rail infrastructure is needed to handle the large pipe segments that would need to be transported along the pipeline route.

FINANCIAL RESOURCES

- FNSB relies heavily on Alaska State Government to provide services such as police and fire protection outside the cities, and road maintenance. With the reduction in oil prices and the associated decrease in state revenues, the level of service is threatened. In addition, other state resources that would normally help to fund economic development projects are diminished.

LAND USE

- FNSB features a generally dispersed land use pattern. This provides flexibility for the private sector in developing new projects but creates challenges in terms of efficiencies for infrastructure development.

OTHER FACTORS THAT RELATE TO ECONOMIC PERFORMANCE:

If it is true that a healthy, well-performing economy requires, among other things, a well-educated workforce, then it is doubly-true that, to operate at peak-efficiency, a workforce requires a range of services conducive to personal and family well-being. Below we summarize services the delivery of which support the primary factors for economic performance.

HOUSING

- Since the Year 2000, FNSB has had a faster rate of housing growth than the state as a whole, with this trend accelerating since the 2008 recession. However, all of the growth has been in rental housing with a slight decline in ownership housing since 2008.

- Despite the growth in units, however, rental housing remains relatively expensive. The census reports a higher percentage of renter households paying more than 30% of their income for housing in FNSB than in the State as a whole. The cost of homeownership in the cities of Fairbanks and North Pole is relatively higher than the statewide average as well.

HEALTH SERVICES

- FNSB serves as a hub for health care and social services for the region, with more than 5,000 jobs associated with these services.

RECREATION AND CULTURAL SERVICES

- FNSB offers a wide range of recreational and cultural attractions to residents and visitors alike, and is a destination for cruise ships as well as increasing numbers of Asian tourists.

- Efforts continue to expand infrastructure needed to support increased winter tourism as well as building facilities such as a convention center that would increase business travel to the region.

5. STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS ANALYSIS

This section of the CEDS summarizes strategic issues for the Borough to address, based in part on the economic assessment in the previous section, but also taking into account qualitative considerations about the Borough's competitive position and anticipated internal and external future trends. In addition to providing a summary of economic conditions, these issues provide a foundation for the Borough's economic goals and objectives and the strategic action plan.

STRENGTHS:

- Mining is healthy and is growing more rapidly in FNSB than statewide
- Significant military presence
- Multi-modal transportation hub, with large land supply for future expansion
- Federal & State governments provide stability; although declining oil prices have affected state revenues and local support.
- Health care industry present and strengthens regional hub
- Winter wonderland and summer playground
- Alaskan attitudes: independence, perseverance & resilience
- Good digital communications infrastructure
- Proximity to Prudhoe Bay oil fields
- Strong land grant university

WEAKNESSES:

- High energy prices affect cost of doing business
- Pipeline throughput declining
- Alaska Airlines has shifted hub operations to Anchorage
- State, Federal & Local regulators do not operate at the speed of business
- Transportation linkages to suppliers

- Lack cold storage & processing facilities for food, flowers, animals, milk, cheese
- Flint Hills refinery closed
- Little private construction
- Restricted access to capital
- Lack of entrepreneurial support systems or network
- Limited manufacturing knowledge or infrastructure
- Regular year-long Stryker deployments
- Lack of connection with North Slope and its producers
- No railroad to the continental US or North Slope
- Mixed messages to outside world

OPPORTUNITIES:

- Although the FNSB economy has recovered slowly from the recession, state projections indicate strong population and job growth potential
- Implementation of Interior Energy Project will reduce energy costs for FNSB
- New fighter wing at Eielson will expand economy, as will major investment at Clear AFB and Fort Greely, as FNSB is the main commercial hub for these areas.
- Developing and marketing alternative energy technologies or sources
- Trucking LNG to our community to provide affordable energy
- FNSB as hub for liquid fuel distribution
- Grow and sell local niche agricultural products
- Develop and market solutions to cold weather challenges
- Adding value to natural resources extracted
- University as center for Arctic research
- Winter tourism
- Increasing tourism from Asia

- Extensive limestone deposits
- New mineral development
- Revitalize downtown Fairbanks- make it a destination
- Develop North Pole as a destination
- Develop greenhouses using waste heat
- Develop and upgrade Joint Pacific Alaska Range Complex

THREATS:

- Reduced oil prices may reduce exploration and production
- Competitive areas such as Matanuska-Susitna Borough seeing faster growth from oil industry
- State & Federal government budget cuts
- State government paid for by declining throughput
- $C0_2$ legislation
- $PM_{2.5}$ not addressed
- Cruise lines move more ships from Alaska

6. RESILIENCE THROUGH ECONOMIC DIVERSIFICATION AND EMERGENCY MANAGEMENT PLANNING

This section of the CEDS Update discusses ways in which officials in the public and private sectors have embraced "resilience" as a framework for planning in the FNSB region, particularly in the face of natural and/or man-made shocks to FNSB's economy and quality of life. First, this section summarizes steps taken by officials in the FNSB to diversify the economy. Then, this section discusses emergency management plans in place to deal with natural and/or man-made disasters.

RESILIENCE THROUGH ECONOMIC DIVERSIFICATION

FNSB's economy is tied closely and directly to the natural environment in many ways. Economic sectors such as natural resource extraction (oil, natural gas, metals, and minerals) and tourism are obvious examples, in that the former involves extracting materials from the ground, whereas the latter involves leveraging the natural environment for recreational use by visitors and residents alike. Even the economic sector having to do with national security is related to the natural environment, insofar as FNSB itself represents a strategic location relative to evolving national security risks and challenges emanating from the Pacific Ocean. Yet, each of these three sectors is highly vulnerable to shocks emanating from beyond the region and Alaska. The price of energy and other precious metals fluctuates daily on the world market, resulting in possible shuttering of operations and loss of jobs on a moment's notice. While thankfully FNSB has enjoyed an increase in the deployment of military personnel into FNSB, this only underscores how the fate of this large part of FNSB's economy is tied to decisions made in Washington D.C. In an effort to improve the resilience of these leading sectors in the face of any kinds of shocks, FNSB officials have attempted to build-on and diversify these critical parts to the Borough's economic engine. Below are select examples of ways officials are seeking to diversify the FNSB economy.

MICRO-GRIDS

Excluding the potential and yet unrealized supply of energy in the Arctic National Wildlife Refuge (ANWR), officials throughout Alaska including in the FNSB recognize that the amount of petroleum produced from the North Slope has declined annually since the 1980s. That recognition, along with the volatile nature of the price of oil and natural gas on the world commodities markets, has led officials to seek alternative ways of generating and delivering energy for the masses, especially FNSB households who have historically faced high home energy costs. FNSB officials have supported efforts at developing technologies allowing micro-grids. Micro-grids in operation in Alaska provide electric power service exclusively to isolated rural populations, with total capacity exceeding 800 MW, the largest installed base of microgrids in the world today (though China may overtake Alaska by the end of next year), according to a study issued by Navigant Consulting. In addition, many in FNSB see in this

technology a potential export industry for the region, since it is not confined to cold weather applications, but could be marketed in many developing areas of the world. "Over the last decade, Alaska has quietly emerged as a global leader in the development and operation of microgrids," declared Gwen Holdmann, director of the Alaska Center for Energy and Power at the University of Alaska Fairbanks, in a recent interview.[35]

RAIL LINE EXPANSION

An expansion of an existing rail line located near an operating refinery could bolster petroleum transmission and refining in the FNSB. Prior to Spring 2014, there were two refineries operating in North Pole. With the shutdown of Flint Hill Resources Refinery in 2014, now there is only the Petro Star Refinery. Officials see in the expansion of a rail line close to Petro Star a way to help this refinery pick up some of the slack resulting from the shuttering of the Flint Hills Resources plant. Thus, the rail line expansion is key to keeping the energy value chain (i.e. exploration, production, transmission, refining, and distribution) in the FNSB as much as possible.

TOURISM

Many people from across the globe come to the FNSB to enjoy the natural wonders in this region, such as Denali Park and Reserve. Fairbanks is also a popular gateway for tours into Alaska's Northern Region. The majority of visitors come during the Summer months. In an effort to lessen the wide swings in the tourism industry, officials are seeking ways to diversify this industry even more by showcasing recreational and cultural opportunities during the Winter months.

NATIONAL SECURITY

In a development greatly encouraged by officials in the region, military facilities in the FNSB are expanding due to their strategic location relative to threats and challenges in and around the Pacific Ocean. Eielson AFB in FNSB is on the cusp of serving as the base for F-35 fighter jets, the first 54 of which will show up at Eielson in the Spring of 2019. In total, the basing of the F-35s at Eielson will result in approximately 3,000 additional people in the FNSB, 385 new students to local schools and the sale or rental of more than 300 homes in the community, with an estimated $450 million infused into the FNSB economy between 2016 and 2020. The US military is also looking at ways to improve the satellite-based communication system, especially considering ways to improve secure communication north of FNSB to the Arctic region.[36] Military officials have also sought to improve the missile defense system in place in Fort Greely, in the face of threats especially from the Republic of North Korea.[37] Defense officials recently announced plans to implement a long-range discriminating radar system in Alaska.[38]

---

35 "Alaska Leads the World in Microgrid Deployments" (Navigant Research Blog, December 17, 2014) http://bit.ly/1j6oUet

36 MUOS Gives Navy First Reliable Military Satellite Connection In The Arctic (http://bit.ly/1O0rAav)

37 "A Missile Defense System Is Taking Shape in Alaska", New York Times, http://www.nytimes.com/2006/12/10/us/10greely.html?_r=0

38 "Pentagon plans long-range missile defense radar in Alaska", Reuters, May, 23, 2015 http://bit.ly/1X306aa

AGRICULTURE

Given that Alaska as a whole imports the bulk of its food, in large part because of the brief growing seasons statewide, FNSB officials are looking at ways to get around this natural disadvantage by promoting technologies to grow more food indoors. Alaskan companies have developed containerized growing units that can efficiently allow year-round vegetable production in the Alaskan climate. Deployment of these types of units would reduce the risk of food transportation failures from outside the region.

RESILIENCE THROUGH EMERGENCY MANAGEMENT PLANNING

In 2012, representatives from the City of Fairbanks, City of North Pole, and the FNSB convened a series of meetings to prepare, finalize, and ultimately adopt a Multi-Jurisdictional Multi-Hazard Mitigation Plan (HMP). There had been several iterations of a HMP since 2004, but prior to 2012, no such plan had been adopted. Between 2012 and 2014, extensive work went into preparing the HMP, as well as extensive coordination between the multi-jurisdictional HMP committee and the local public safety agencies, public utility providers, and other major stakeholders for review of the plan and inclusion of local non-governmental priorities. In 2014, the City of Fairbanks, the City of North Pole, and the FNSB completed and adopted the HMP.

HMP profiles five natural hazards – flood, wildfire, severe weather, seismic events, and volcanic ash - assesses community vulnerability and risk associated with these hazards, and presents mitigation strategies for each hazard in order to reduce or eliminate human and economic losses associated with natural disasters, while also fostering community resilience in the face of these disasters. The overall goals of the HMP are to:

1. Eliminate and/or Reduce Loss of Life and Injuries
2. Prevent and/or Reduce Property Damage
3. Reduce Economic Impact
4. Preserve Natural Systems
5. Promote Outreach and Education
6. Increase and Enhance Collaboration
7. Enhance Coordination of Emergency Response

The benefits of developing a multi-jurisdictional plan are: improved communication and coordination among jurisdictions and other regional entities; comprehensive mitigation approaches to reduce risks affecting multiple jurisdictions; resource- and cost-sharing that increase efficiency and reduce duplication of efforts; and clear organizational structure assigning responsibilities among jurisdictions, creating opportunities for increased participation by local governments, non-profits, and members of

the public. In compliance with statewide Multi-Jurisdictional Hazard Mitigation Plan regulations, the HMP coordinates with the Cities of Fairbanks and North Pole, and seeks to include the fifteen unincorporated Census Designated Places (CDPs) within the Borough. The HMP incorporates information and strategies from existing Federal, State, and local guidelines and plans, as well as scientific reports and studies from the University of Alaska Fairbanks, various State departments, and the USGS.

As an example of how the HMP works, in the case of wildfires the detailed document discusses regional and state efforts underway to promote and ensure coordinated action to suppress wildfires. In addition, the document discusses regulations in place in the City of Fairbanks, City of North Pole and the FNSB to minimize the risk of spreading of fires, as well as what these municipalities can do to better improve coordinated efforts to suppress fires where joint efforts are called for. To this end, the document discusses securing an Emergency Operations Center (EOC) where fire officials from each of the municipalities might convene in their effort to jointly fight fires or other hazards. This recommendation has now been implemented. A number of other recommendations are included in the document the intent of which is to lessen the risk of wide-spread fires.

7. GOALS AND OBJECTIVES

VISION

To improve the FNSB residents' quality of life and standard of living by developing goals, establishing objectives and implementing strategies that sustain, enhance or increase economic and social opportunities for local residents.

COMMUNITY ECONOMIC DEVELOPMENT GOALS

COMMUNITY PRIORITY NO.1: Lower and stabilize FNSB energy costs by expanding the energy portfolio with a focus on local resources.

OBJECTIVE: Bring affordable, sustainable natural gas to the Fairbanks North Star Borough.

- Continue to support and coordinate with the implementation of the Alaska Interior Energy Project (IEP).
- Actively support continued development of new local natural gas distribution systems in FNSB in communities not currently served. Assist in siting and development of storage facilities to support the local natural gas distribution system.

OBJECTIVE: Support geothermal energy production in and around the Interior region.

OBJECTIVE: Find ways to recover and use waste heat to heat buildings and greenhouses in the FNSB.

OBJECTIVE: Support University of Alaska Fairbanks research to find new ways to provide affordable clean energy in the FNSB and surrounding regions.

COMMUNITY PRIORITY NO.2: Anchor the missions of Fort Wainwright, Eielson Air Force Base, Fort Greely and Clear Air Force Stations and encourage increased utilization of the existing facilities.

OBJECTIVE: Actively support retention and expansion of the missions at regional military bases.

- Promote local contracting opportunities to ensure local supplies and services are readily available to the bases and military families.
- Coordinate with workforce agencies to assist with spousal employment opportunities as well as the private sector transition for military personnel.

COMMUNITY PRIORITY NO.3: Develop regional cooperative market program to create larger market for goods and services produced in the Borough.

OBJECTIVE: Coordinate industry cluster strategies and projects to promote export of FNSB products and technologies, particularly in areas of energy micro-grids, mining and unique agricultural products.

ADDITIONAL INDUSTRY CLUSTER DEVELOPMENT GOALS

MINING: MAINTAIN AND EXPAND FNSB'S POSITION AS A GROWING MINING CENTER IN THE STATE

OBJECTIVE: Work with industry to provide workforce development, transportation services and other infrastructure to support expansion of mining in FNSB.

ENERGY: STRENGTHEN FNSB'S POSITION AS A HUB OF ENERGY DEVELOPMENT SERVICES AND RESEARCH

OBJECTIVE: Develop a stronger support role for the oil and gas industry, including infrastructure and workforce capacity to support construction of a natural gas pipeline.

OBJECTIVE: Advocate for responsible development of the petrochemical industry in the Borough.

OBJECTIVE: Position the Interior as an energy research and development hub.

TOURISM: DIVERSIFY VISITOR SERVING ATTRACTIONS AND FACILITIES TO EXTEND THE TOURISM SEASON AND EXPAND THE TYPES OF VISITORS ATTRACTED TO THE BOROUGH.

OBJECTIVE: Increase winter tourism through improved transportation services, attractions and enhanced marketing efforts.

OBJECTIVE: Develop a convention center to increase business visitors.

OBJECTIVE: Develop a performing arts center to increase entertainment opportunities.

OBJECTIVE: Expand cooperative marketing programs with the airlines to gain access to new visitor markets.

AGRICULTURE: ENHANCE THE ECONOMIC VIABILITY OF AGRICULTURE BOTH FOR LOCAL CONSUMPTION AND AS AN EXPORT SECTOR

OBJECTIVE: Support new product research to find agricultural niches for the Borough.

OBJECTIVE: Explore the feasibility of community systems for greenhouse heating, fertilizer production and value added processing to increase economic feasibility of agriculture.

OBJECTIVE: Conduct local and external marketing to encourage local consumption of Borough food products as well as promoting external markets for export commodities.

PROMOTE ADDITIONAL DIVERSIFIED INDUSTRIES AND MANUFACTURING

OBJECTIVE: Promote wood-products manufacturing industry cluster (i.e. furniture manufacturing and forest products).

OBJECTIVE: Promote unmanned aircraft systems (UAS) industry.

ECONOMIC FOUNDATIONS

Access to Capital

OBJECTIVE: Promote community access to venture capital.

- Identify and develop sources of public and private capital for the development and expansion of businesses in the FNSB.
- Market information about available sources of capital to local businesses.

Business Climate

OBJECTIVE: Develop a community of entrepreneurs.

- Educate local businesses about business opportunities and how to develop them.
- Encourage and support research to create and improve business opportunities in the FNSB.

Human Resources

OBJECTIVE: Develop and retain an educated workforce.

- Support programs that will train educators, teachers and instructors to ensure the quality of the educational system and preserve cultural heritages.
- Encourage excellence in the K-12 and post-secondary systems producing results that exceed state and national averages.
- Support the expansion and enhancement of the University of Alaska and Community and technical College (CTCF), encouraging funding levels that allow growth, promote excellence, increase maintenance funding, the addition of new programs and both programmatic and institutional accreditation.
- Retain those we educate.

OBJECTIVE: Provide job skills development opportunities.

- Promote vocational, technical, and career training opportunities within the FNSB that prepare residents to compete in the global marketplace as well as meeting regional industry cluster needs.

  Local and regional vocational needs include:

  - Educators
  - Health care professionals
  - Transportation and civil engineers
  - Health, safety and environmental inspectors

- Mining workers
- Pipeline welders and other oil and gas occupations

Physical Infrastructure

OBJECTIVE: Expand the current railroad and market Fairbanks as a natural hub.

OBJECTIVE: Expand and improve water distribution and wastewater collection systems to avoid localized quality and supply issues associated with individual systems.

OBJECTIVE: Expand solid waste recycling capacity to improve the sustainability of the solid waste disposal system.

OBJECTIVE: Support the design, construction and maintenance of trail, road, rail and air transportation systems that improve access to the region.

- Support the funding and completion of relevant components of the Statewide Transportation Improvement Program (STIP), the Fairbanks Metropolitan Area Transportation System (FMATS)/Metropolitan Planning Organization (MPO) and the Transportation Improvement Program (TIP).

Quality of Life

OBJECTIVE: Support quality in health care, education, public safety, beautification, government and culture that would improve the individual and community quality of life in the FNSB.

- Promote the development and maintenance of community and cultural centers and theme that enhance the Borough's sense of place.
- Support the development and construction of year-round recreational facilities and opportunities consistent with, and to capitalize on local climatic conditions. Promote FNSB as a year round sport and recreation center.

8. STRATEGIC PROJECTS

A number of potential implementation projects for FNSB have been identified through discussions with economic development stakeholders in the Borough. The FNSB Economic Development Commission may set priorities for these projects based on the goals and objectives outlined in the previous section.

ENERGY

COMMUNITY PRIORITY NO.1: LOWER AND STABILIZE FNSB ENERGY COSTS

Project: Support Completion of the Interior Energy Project (IEP). The State of Alaska has recognized the vital need for more affordable and cleaner energy sources for Fairbanks and other interior areas of the State. The Interior Energy Project is proceeding with the development of local natural gas distribution systems in North Pole, with plans for further expansions in future phases. As of November 2015, several issues remain: 1) there is a need to develop local fuel storage facilities, 2) final plans need to be completed for a long term gas supply, and 3) residents need to convert home heating systems to gas when it is available.

1) **Storage Facility.** The basic steps involved with this project include identifying a private sector partner to construct and operate the storage facility and secondly to determine the appropriate location for the facility. Depending on the desired location, FNSB or the cities of North Pole and Fairbanks may have a role in the land use planning and entitlement process for the facility and the connecting pipelines from the gas supply to the distribution system. FNSB efforts to support the successful completion of this component of the IEP are of the highest importance.
2) **Gas Supply.** While the short term plan is to truck LNG north from Anchorage, the long term option of a natural gas pipeline remains under consideration. State Transportation officials have indicated that improvements to the Fairbanks Intermodal Facility would be needed for the rail facilities to handle the large pipe dimensions (4' X 80') that would be used for this pipeline. If needed, this would be a very high priority project; however, further planning is needed at the state level to determine the timing and specific requirements of this project.
3) **Home Heating System Conversion.** It is vital to the economics of the entire project that residents convert to using natural gas when it is available. This is necessary to achieve the scale of revenue to make the system financially viable. The Borough, IGU and AIEDA are collaborating on an energy conversion program. One approach would be to offer low interest loans to make conversion easier for residents.

INDUSTRY CLUSTER GOALS: STRENGTHEN FNSB'S POSITION AS A HUB OF ENERGY DEVELOPMENT

Project: Petro Star Asphalt Plant. Petro Star has announced plans to invest $30 million in an asphalt plant in North Pole. With the shift of the Flint Hills refinery from production to distribution, the Petro Star project would constitute a major boost to the energy industry in FNSB. While the Petro Star

location is near existing rail facilities, it is not currently connected to rail service. This project would investigate the benefits and costs of extending rail infrastructure to serve this plant.

Project: Microgrid energy technology development – market analysis for ancillary business development in FNSB. With research occurring at UAF to develop new technologies for microgrids, opportunities are anticipated for commercial enterprise development to produce components and systems for export. This project would produce a market analysis to determine the types of products that could be feasibly designed and /or manufactured locally, the existing businesses and infrastructure available to support growth of this industry, and gaps or weaknesses in the local business mix that would need to be addressed to fully realize this opportunity.

MILITARY

COMMUNITY PRIORITY NO. 2: ANCHOR THE MISSIONS OF FORT WAINWRIGHT, EIELSON AIR FORCE BASE, FORT GREELY, AND CLEAR AIR FORCE STATIONS

A number of major investments by the Department of Defense are underway to further expand the military mission in and around FNSB. The addition of the F-35 fighter squadrons at Eielson AFB will add a population of 3,000 to the area, in addition to related private sector support functions. In addition, expansions and upgrades to systems at Ft. Greely (Ground-based Missile Defense System) and Clear AFB (Long Range Discriminating Radar) have or will add nearly $2 billion to the regional economy. FNSB has an opportunity to serve as a retail and entertainment hub for both the construction workers and the long term military and civilian workers supported by these projects. Eielson AFB is particularly concerned that local retail opportunities do not serve the military population well. Expansion of this sector in North Pole would benefit City residents as well as military families.

Project: Regional Retail Market Analysis. This project would produce a market analysis primarily focused on the North Pole area, but also addressing potential market expansions associated with other regional military and civilian developments that would expand retail development opportunities in FNSB. As regards North Pole, the analysis would address potential repositioning of older commercial centers to better support future retail opportunities and also the expansion of other services such as medical and elder care.

MILITARY/INDUSTRY CLUSTER DEVELOPMENT

As discussed above under Community Priority No. 1 for Energy, research at the University of Alaska Fairbanks (UAF) can serve as a catalyst for commercial enterprise development in FNSB. While it is difficult to predict all the new technologies that may become viable targets for commercialization, the development of Unmanned Aircraft Systems (UAS) has tremendous potential. In 2012, the Alaska Center for Unmanned Aircraft Systems Integration (ACUASI) was established at UAF. Since that time, the FAA has established six test ranges in Alaska, one at Poker Flat in FNSB. The potential expansion of this industry has both military and civilian applications. Ft. Wainwright already supports the Shadow UAS and is expecting to host the larger Grey Eagle UAS in early 2016. With these major assets in the UAS industry, FNSB is well positioned to pursue an expansion of both R&D and commercial

applications of UAS technology. The State of Alaska has developed a strategic plan to support expansion of UAS, which features a number of program initiatives, some of which are appropriate for implementation at the local Borough level. These include establishing manufacturing/property tax credits and also supporting the development of a technology park in association with UAF to accelerate commercialization of university UAS research, provide testing space and offer an attractive location to attract anchor businesses.

Project: Prepare feasibility study for a technology business park to support commercial enterprises in UAS and other technologies. Local development of a tech park would help to attract anchor businesses in the UAS field and also provide specialized facilities for start-up firms to test new technologies and systems being developed at ACUASI. FNSB is seeking a private sector partner to pursue this project. An important next step would be to prepare a market feasibility study, which would help in identifying an appropriate location, securing investments for infrastructure, establishing a marketing program for the development and integrating entrepreneurship programs with implementation of the tech park.

TOURISM

INDUSTRY CLUSTER GOAL: DIVERSIFY TOURISM ATTRACTIONS AND EXTEND THE SEASON

Two major opportunity areas for tourism development in FNSB would be to increase the capacity to support business travel to the Borough and to increase facilities needed to encourage more winter tourism. Several projects in the City of Fairbanks would help to capture these opportunities.

Project: Convention Center in Fairbanks/Polaris Hotel Site Redevelopment. Explore Fairbanks has commissioned market studies that demonstrate the feasibility of developing a convention center in Fairbanks that would serve to boost business travel to the region. Major steps in implementation of the project include securing private sector partners and investors, determining the best location and completing any public improvements needed to support the facility. Among the sites under consideration is the location of the old Polaris Hotel building. This building is abandoned and the City is pursuing strategies to have it dismantled and cleared. This is a key location in Downtown Fairbanks and could support other business development if not the convention center. Therefore, making this site available is an important project in addition to pursuing development of the convention center.

Project: Rail Car Storage in Fairbanks to facilitate expansion of winter trips to Denali. Rail service from Anchorage to Fairbanks currently terminates in mid-September and resumes in mid-March. Alaska Railway has been working to begin the Spring season earlier in recent years. However, a primary impediment to winter service that might provide service for tourists from Fairbanks to Denali is the presence of winter storage facilities for cars in Fairbanks. Given other funding priorities for Alaska Railway, there is no current plan to develop such facilities, but if a private sector partner could be identified, this would provide a major boost to winter tourism in FNSB.

Project: Maintaining Aurora Northern Lights Viewing and Interpretive Center. As of June, 2015, there is some concern that the property on which the Aurora Viewing Center is located may be

sold for mining operations, which would compromise the quality of the experience offered at the center, as well as the adjacent ski area. If this occurs, FNSB should research alternate locations, as this viewing center is a major tourism asset in the region and has been a very profitable operation.

MINING

INDUSTRY CLUSTER GOAL: MAINTAIN AND EXPAND FNSB'S POSITION AS A GROWING MINING CENTER IN THE STATE

Project: Coordinate training services to support the needs of expanded underground mining operations. A mining training center has been established in Delta Junction, with effective on-the-job training programs to serve a number of underground mine operations. The FNSB workforce and local mining industry would benefit from further coordination of training agencies and educational institutions in FNSB to provide access for existing and potential mine workers to specialized training. This may be accomplished through the development of online training connections to the Delta Junction Training Center.

Project: Analyze Need for Rail service to Molybdenum Ridge Mine. New and expanded operations of the Molybdenum Ridge mine may require additional rail service. This project would analyze the need and feasibility of this infrastructure expansion.

AGRICULTURE

INDUSTRY CLUSTER GOAL: ENHANCE THE ECONOMIC VIABILITY OF AGRICULTURE.

Project: Install and Operate a Contained Grow Unit. Through research and testing efforts occurring in FNSB, commercially viable growing units have been developed to allow year round food production. It is estimated that two-thirds of food can be grown indoors, with LED light technology driving current advances in feasibility. One developer of these systems is currently working with 35 different crops. The output is reported to be as high as 1,800 heads of lettuce per month. The units offer a year round growing season and actually produce faster growth rates than outdoor farming. FNSB could partner with the FNSB School District, UAF Cooperative Extension and North Pole High School Future Farmers of America as well as local food security non-profit agencies to install systems for local use, providing training and experience to future farmers as well as an expanded food source for those in need.

Project: Coordinate with workforce agencies to assist Peony industry to secure a reliable workforce for harvest season. A workforce of about 300 is needed during the Peony harvest season. While this is a short time frame, the industry has a worldwide market and provides an excellent opportunity to diversify agricultural exports from FNSB.

Project: Support research into product development from Rhodeola. This plant is found in cold climates throughout the world and may have beneficial product applications for tea, food supplements and nutraceuticals.

INSTITUTIONAL/NON-PROFIT SECTOR

ECONOMIC FOUNDATIONS GOAL: QUALITY OF LIFE

Project: Expand Customer Transportation Capacity for Local Food Security Agencies. Members of the Catalyst Kitchens Network, of which Stone Soup Cafe in Fairbanks is one, are designed and required to provide quality food for the community. Students learn their skills in a real world, hands-on situation, providing quality, nutritious meals for other individuals in need. Currently, Stone Soup Cafe is fulfilling this requirement with its contract with Housing First to provide lunches and dinners for their residents. However, it is clear that the need in the community is greater, which has been documented in a recent survey conducted by a Vista volunteer for the organization. In order to expand service, this organization needs a vehicle to transport food in a safe fashion, which is estimated to cost up to $40,000.

PHYSICAL INFRASTRUCTURE

ECONOMIC FOUNDATIONS GOAL: ENHANCE PHYSICAL INFRASTRUCTURE

Project: Expand Potable Water Systems. Many areas of the Borough are served by individual or very localized water systems. However, this creates water quality and supply issues where quality standards are not maintained. Community wide water and wastewater systems provide a better solution to many of these issues. As an example, in 2015, the City of North Pole received notification from the Alaska Department of Environmental Conservation (ADEC) that it is eligible for over $3.54 million in Alaska Drinking Water Fund (ADWF) loans. The first ADWF loan offer is for $1.17 million for a Water System Engineering and Design project. If accepted, the loan would help finance the design and engineering for a water system expansion to provide water to properties contaminated with the industrial compound sulfolane. The second ADWF loan offer is for $2.36 million for a Water Plant Emergency System Improvements project. If accepted, the loan would help finance upgrades and energy efficiency improvements at the Utility's water treatment plant. Both loan offers are offered at the low annual interest rate of 1.5% for a term of 20 years.

Additional funding to expand these types of system solutions in other areas of FNSB would greatly help to lower business costs, improve property values and enhance the business climate, in addition to improving the quality of life for residents.

Project: Create a Centralized Waste Recycling Facility. The Borough is planning to construct a centralized facility to increase recycling capacity. The project is still in preliminary planning stages and a location has not yet been determined. Preliminary cost estimates have indicated the facility may cost as much as $5 million, but the final cost would be subject to final design requirements.

9. PERFORMANCE MEASURES

The performance measures reflect economic and social indicators that would be improved through implementation of the goals, objectives and projects outlined in the CEDS. These indicators would be monitored and reported on annually in the CEDS updates.

1. Total Borough employment growth in relation to statewide employment growth rates.
2. Unemployment rate in relation to state unemployment rate.
3. Employment growth in key industry clusters, including mining, energy, tourism, military contractors, agriculture/food processing, construction and transportation/warehousing.
4. Growth in the number of businesses.
5. Growth in average wage levels.
6. Growth in household income.
7. Dollar value of investments in infrastructure.
8. Educational attainment.
9. Number of graduates of post-secondary training and education institutions and programs.

APPENDIX A: DATA TABLES

APPENDIX TABLE 42
POPULATION TRENDS (2010-2014) AND POPULATION PROJECTIONS (2014-2025): FAIRBANKS NORTH STAR BOROUGH AND ALASKA

	Population and Population Projections		Annual Percentage Change	
	FNSB	Alaska	FNSB	Alaska
14-25	1.4%	1.0%		
10-14	0.5%	0.9%		
2025	116,023	825,950	0.9%	0.8%
2024	114,953	819,408	0.9%	0.8%
2023	113,893	812,918	0.9%	0.8%
2022	112,843	806,479	1.1%	0.9%
2021	111,612	799,134	1.1%	0.9%
2020	110,395	791,856	1.1%	0.9%
2019	109,191	784,644	1.1%	0.9%
2018	108,000	777,498	1.1%	0.9%
2017	106,822	770,417	4.9%	2.5%
2016	101,875	751,839	1.3%	1.0%
2015	100,608	744,247	1.3%	1.0%
2014	99,357	736,732	-1.4%	-0.1%
2013	100,807	737,259	0.6%	0.8%
2012	100,227	731,081	2.2%	1.2%
2011	98,029	722,572	0.5%	1.7%
2010	97,581	710,231		

Source: Applied Development Economics, based on US Census 2010 SF1 Table P12, US Census Population Estimates Program (2011-2014) [http://bit.ly/1LlDybI]and Alaska Dept. of Labor and Workforce Development, Research and Analysis Division ("Population Projections" [http://bit.ly/1NPP1QZ])

APPENDIX TABLE 43

ANNUAL TRENDS IN EDUCATIONAL ATTAINMENT BY PERSONS 25 AND OVER: FAIRBANKS NORTH STAR BOROUGH AND ALASKA

Fairbanks North Star Borough	2000	2010	2013	2013 Distribution	00-10	10-13
Total	47,974	58,214	60,629		2%	1%
Graduate or Professional Degree	5,109	5,730	8,185	13.5%	1%	13%
Bachelor's Degree	7,859	10,982	11,580	19.1%	3%	2%
Associate's Degree	3,595	6,028	5,881	9.7%	5%	-1%
Some College, No Degree	15,253	16,205	16,127	26.6%	1%	0%
High School Graduate	12,240	14,832	14,854	24.5%	2%	0%
9th to 12th Grade, No Diploma	2,881	2,975	2,789	4.6%	0.3%	-2%
Less than 9th Grade	1,037	1,462	1,213	2.0%	3%	-6%
Alaska	2000	2010	2013		00-10	10-13
Total	379,556	450,577	462,659		2%	1%
Graduate or Professional Degree	32,611	42,354	45,341	9.8%	3%	2%
Bachelor's Degree	61,196	83,357	84,204	18.2%	3%	0%
Associate's Degree	27,213	36,947	38,401	8.3%	3%	1%
Some College, No Degree	108,442	133,371	127,231	27.5%	2%	-2%
High School Graduate	105,812	113,996	129,082	27.9%	1%	4%
9th to 12th Grade, No Diploma	28,619	27,710	24,058	5.2%	-0.3%	-5%
Less than 9th Grade	15,663	12,841	14,342	3.1%	-2%	4%

Source: Applied Development Economics, based on US Census 2000 SF 1 P37Table, and US Census ACS 2010 1-Year Sample S1501 and 2013 1-Year Sample S1501 (note: initial 9th to 12 Grade, No Diploma for FNSB adjusted based on 3-Year (2009-2011) ACS sample ratio, resulting in change in total from reported 59,868 to 58,214)

APPENDIX TABLE 44
ANNUAL TRENDS IN PERSONA PER CAPITA INCOME:
FAIRBANKS NORTH STAR BOROUGH AND ALASKA

Per cap income	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	00-08	08-13
FNSB	$29,416	$29,674	$30,833	$32,007	$32,652	$34,762	$37,353	$38,846	$41,974	$41,730	$41,999	$45,087	$46,033	$45,313	4.5%	1.5%
Alaska	$31,491	$32,855	$33,806	$34,810	$35,717	$37,374	$39,135	$41,723	$45,021	$44,184	$45,565	$48,181	$49,906	$50,150	4.6%	2.2%
FNSB-v-State	93.4%	90.3%	91.2%	91.9%	91.4%	93.0%	95.4%	93.1%	93.2%	94.4%	92.2%	93.6%	92.2%	90.4%		

Source: Applied Development Economics, based on US BEA "CA1: Personal per Capita Income Summary"

APPENDIX TABLE 45

ANNUAL TRENDS IN PERSONAL PER CAPITA TRANSFER PAYMENTS: FAIRBANKS NORTH STAR BOROUGH AND ALASKA

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	00-08	08-13
Personal Per Capita Income: FBSN	$29,416	$29,674	$30,833	$32,007	$32,652	$34,762	$37,353	$38,846	$41,974	$41,730	$41,999	$45,087	$46,033	$45,313	4.5%	1.5%
Per capita earning by place of work (wage and proprietor income)	*$23,489*	*$24,116*	*$25,701*	*$27,282*	*$28,328*	*$30,263*	*$32,754*	*$32,608*	*$33,735*	*$34,601*	*$34,473*	*$36,491*	*$37,125*	*$36,795*	*4.6%*	*1.8%*
Less: Per capita contributions for government social insurance 1/	*$2,432*	*$2,471*	*$2,629*	*$2,757*	*$2,893*	*$3,107*	*$3,472*	*$3,416*	*$3,500*	*$3,547*	*$3,590*	*$3,437*	*$3,534*	*$3,879*	*4.7%*	*2.1%*
Plus: Per capita adjustment for residence 2/	*-$2,448*	*-$2,628*	*-$2,803*	*-$3,085*	*-$3,238*	*-$3,492*	*-$3,777*	*-$3,634*	*-$3,713*	*-$3,770*	*-$3,730*	*-$3,944*	*-$4,042*	*-$3,870*	*5.3%*	*0.8%*
Plus: Per capita dividends, interest, and rent 3/	*$6,108*	*$5,806*	*$5,711*	*$5,900*	*$6,007*	*$6,464*	*$6,938*	*$7,880*	*$8,413*	*$8,197*	*$8,224*	*$9,079*	*$9,766*	*$9,787*	*4.1%*	*3.1%*
Plus: Per capita personal current transfer receipts	*$4,698*	*$4,851*	*$4,852*	*$4,668*	*$4,448*	*$4,634*	*$4,911*	*$5,408*	*$7,039*	*$6,250*	*$6,623*	*$6,897*	*$6,718*	*$6,479*	*5.2%*	*-1.6%*
Personal Per Capita Income: Alaska	$31,491	$32,855	$33,806	$34,810	$35,717	$37,374	$39,135	$41,723	$45,021	$44,184	$45,565	$48,181	$49,906	$50,150	4.6%	2.2%
Per capita earning by place of work (wage and proprietor income)	*$25,195*	*$26,685*	*$27,803*	*$28,952*	*$30,014*	*$31,371*	*$32,741*	*$34,054*	*$35,322*	*$35,979*	*$36,614*	*$38,182*	*$39,814*	*$40,804*	*4.3%*	*2.9%*
Less: Per capita contributions for government social insurance 1/	*$2,618*	*$2,742*	*$2,845*	*$2,916*	*$3,056*	*$3,231*	*$3,498*	*$3,618*	*$3,700*	*$3,702*	*$3,820*	*$3,574*	*$3,736*	*$4,323*	*4.4%*	*3.2%*
Plus: Per capita adjustment for residence	*-$1,462*	*-$1,550*	*-$1,599*	*-$1,621*	*-$1,671*	*-$1,755*	*-$1,903*	*-$2,068*	*-$2,214*	*-$2,260*	*-$2,247*	*-$2,414*	*-$2,513*	*-$2,518*	*5.3%*	*2.6%*
Plus: Per capita dividends, interest, and rent	*$5,487*	*$5,393*	*$5,309*	*$5,400*	*$5,574*	*$5,917*	*$6,486*	*$7,376*	*$7,967*	*$7,400*	*$7,781*	*$8,480*	*$9,007*	*$9,099*	*4.8%*	*2.7%*
Plus: Per capita personal current transfer receipts	*$4,889*	*$5,069*	*$5,138*	*$4,995*	*$4,855*	*$5,074*	*$5,310*	*$5,979*	*$7,645*	*$6,767*	*$7,238*	*$7,507*	*$7,335*	*$7,087*	*5.7%*	*-1.5%*

Source: Applied Development Economics, based on US BEA "C4 - Components of Personal Income" for FBSN and Alaska (US BEA notes: 1/Employer contributions for government social insurance are included in earnings by industry and earnings by place of work, but they are excluded from net earnings by place of residence and personal income. Employee and self-employed contributions are subtractions in the calculation of net earnings by place of residence and all of the income measures. 2/The adjustment for residence is the net inflow of the earnings of inter area commuters. For the United States, it consists of adjustments for border workers and US residents employed by international organizations and foreign embassies.

Appendix Table 46
Annual Average Trends in Number of Active Duty Personnel and Dependents at Fort Wainwright and Eielson Air Base: 2001 - 2014

Year	Fort Wainwright and Eielson Air Base			Fort Wainwright			Eielson Air Force Base		
	Total Active Duty	Total Depen-dents	Sub-Total	Active Duty	Depen-dents	Sub-Total	Active Duty	Depend-ents	Total Active Duty
08-14	0.4%	2.3%	-0.8%	1.2%	3.5%	-0.2%	-1.8%	-0.8%	-2.5%
00-08	1.3%	-0.4%	2.5%	4.0%	1.8%	5.4%	-3.5%	-4.5%	-2.8%
2014	19,006	7,815	11,191	14,368	5,956	8,413	4,638	1,859	2,779
2013	20,105	8,215	11,890	15,370	6,335	9,035	4,735	1,881	2,855
2012	21,288	8,797	12,492	16,452	6,888	9,564	4,837	1,909	2,928
2011	21,195	9,315	11,879	16,302	7,410	8,892	4,893	1,906	2,987
2010	19,462	8,235	11,227	14,532	6,337	8,195	4,930	1,899	3,032
2009	22,757	9,280	13,477	17,524	7,281	10,243	5,233	1,999	3,234
2008	18,572	6,811	11,761	13,391	4,855	8,535	5,182	1,956	3,226
2007	19,728	8,827	10,901	13,720	6,168	7,553	6,008	2,659	3,349
2006	19,005	9,139	9,865	12,496	6,226	6,270	6,508	2,913	3,595
2005	16,634	7,837	8,797	10,174	4,989	5,185	6,460	2,848	3,612
2004	16,666	7,825	8,842	10,119	4,819	5,300	6,548	3,006	3,541
2003	16,100	7,318	8,782	9,648	4,257	5,391	6,451	3,061	3,391
2002	17,475	7,375	10,100	10,859	4,460	6,400	6,616	2,915	3,701
2001	16,689	7,032	9,656	9,811	4,208	5,603	6,878	2,824	4,054

Source: ADE, Inc., based on FNSB Community Research Center, Community Research Quarterly Spring 2005, Spring 2009, Spring 2012, and Spring 2015

Appendix Table 47

Trends in Aggregate Value Mining Industries: Exploration, Development and Production

	2000	2005	2008	2010	2013	00-08	08-13
Total: Alaska	$1,084,791,000	$3,310,046,825	$3,170,558,697	$3,684,432,710	$3,953,009,646	14.3%	4.5%
Production: Alaska	$919,308,000	$2,858,233,467	$2,427,121,820	$3,126,783,790	$3,418,744,786	12.9%	7.1%
Development: Alaska	$141,710,000	$347,917,969	$396,167,707	$293,293,300	$358,775,844	13.7%	-2.0%
Exploration: Alaska	$23,773,000	$103,895,389	$347,269,170	$264,355,620	$175,489,016	39.8%	-12.8%
Total: Eastern Interior	$147,559,215	$450,986,508	$828,880,491	$1,118,495,312	$1,462,539,717	24.1%	12.0%
Production: Eastern Interior	$111,673,315	$190,115,795	$628,253,434	$949,817,424	$1,236,244,165	24.1%	14.5%
Development: Eastern Interior	$18,128,000	$251,398,769	$151,923,172	$112,762,800	$179,597,323	30.4%	3.4%
Exploration: Eastern Interior	$17,757,900	$9,471,944	$48,703,885	$55,915,088	$46,698,229	13.4%	-0.8%

Source: Applied Development Economics, based on State of Alaska Division of Geological and Geophysical Surveys, Annual Alaska Mineral Industry Reports (2000 through 2013)

Appendix Table 48

Annual Trends in Crude Oil Production By Fields: Alaska North Slope

('000 barrels)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	04-08	08-14
Total Alaska	332,441	315,387	270,481	263,595	249,874	235,491	218,904	204,829	192,368	187,954	181,425	-6.9%	-5.2%
Total North Slope	324,216	308,277	264,244	258,107	245,104	232,740	215,138	201,138	188,334	182,530	174,824	-6.8%	-5.5%
Prudhoe Bay	165,004	153,095	119,690	124,266	123,678	118,155	111,665	105,979	102,622	98,698	90,051	-7.0%	-5.2%
Kuparuk River	71,777	66,330	62,478	57,410	53,002	51,732	46,730	44,519	41,254	40,452	40,190	-7.3%	-4.5%
Colville River	36,094	43,808	44,256	45,468	39,784	37,403	32,893	29,043	25,847	22,639	18,601	2.5%	-11.9%
Nikaitchuq	0	0	0	0	0	0	0	2,012	3,041	4,819	8,215		
Milne Point	18,750	16,002	13,283	12,249	11,796	10,555	9,728	8,041	6,400	6,806	7,065	-10.9%	-8.2%
Oooguruk	0	0	0	0	671	2,706	3,722	2,595	2,508	2,526	4,133		35.4%
North Star	25,077	22,419	18,876	13,877	11,440	7,980	6,135	5,254	3,030	3,388	3,470	-17.8%	-18.0%
Endicott	7,513	6,471	5,180	4,615	4,733	4,210	4,184	3,255	3,156	2,747	2,709	-10.9%	-8.9%
Badami	0	152	480	219	0	0	81	440	477	454	390		
Hansen	0	0	0	3	0	0	0	0	0	0	0		

Source: Applied Development Economics, based on US DOE EIA (Petroleum and Other Liquids [https://archive.is/wWqCl]) and Alaska Oil and Gas Conservation Commission (Monthly Production Reports [https://archive.is/qnJtP])

APPENDIX TABLE 49

QUARTERLY TRENDS IN HOTEL / MOTEL ROOM RECEIPTS: FAIRBANKS NORTH STAR BOROUGH

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	All Year
08-14	8.9%	-1.0%	-2.4%	2.5%	**-0.1%**
00-08	5.2%	5.7%	6.8%	4.9%	**6.1%**
2014	$8,202,072	$14,523,111	$25,687,167	$8,430,551	**$56,842,901**
2013	$7,170,000	$14,031,111	$25,686,646	$10,909,172	**$57,796,929**
2012	$6,603,066	$14,464,988	$28,737,266	$8,886,940	**$58,692,260**
2011	$6,317,082	$13,757,533	$26,099,065	$7,429,594	**$53,603,274**
2010	$5,549,520	$14,817,922	$27,183,699	$6,887,983	**$54,439,124**
2009	$5,554,495	$11,655,651	$25,322,981	$7,235,815	**$49,768,942**
2008	$4,928,353	$15,450,099	$29,652,248	$7,251,731	**$57,282,431**
2007	$5,253,550	$14,703,344	$29,164,266	$7,198,573	**$56,319,733**
2006	$4,396,630	$13,755,407	$27,784,543	$6,628,268	**$52,564,848**
2005	$4,341,420	$11,991,395	$26,148,408	$6,416,203	**$48,897,426**
2004	$4,282,186	$11,444,548	$20,581,108	$6,245,425	**$42,553,267**
2003	$4,269,920	$8,951,462	$18,034,906	$6,161,282	**$37,417,570**
2002	$3,421,975	$9,279,386	$15,610,143	$7,457,382	**$35,768,886**
2001	$3,745,458	$10,072,118	$17,394,993	$7,476,847	**$38,689,416**
2000	$3,274,010	$9,923,679	$17,456,009	$4,959,298	**$35,612,996**

Source: Applied Development Economics, based on FNSB Community Research Center, Community Research Quarterly (Spring 2002, 2005, 2008, 2011, and 2015)