

Alaska LNG

DOCKET NO. PF14-21-000
DRAFT RESOURCE REPORT NO. 5
SOCIOECONOMICS
PUBLIC VERSION

Document Number: USAKE-PT-SRREG-00-0005

ALASKA LNG PROJECT	DOCKET No. PF14-21-000 DRAFT RESOURCE REPORT No. 5 SOCIOECONOMICS	Doc No: USAI-EX-SRREG-00-0005 DATE: FEBRUARY 2, 2015 REVISION: 0
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SUMMARY OF FILING INFORMATION

RESOURCE REPORT No. 5 SUMMARY OF FILING INFORMATION	
Filing Requirement	Found in Section
1. For major aboveground facilities and major pipeline projects that require an EIS, describe existing socioeconomic conditions within the project area. (18 C.F.R. § 380.12(g)(1))	5.2 and 5.3
2. For major aboveground facilities, quantify impact on employment, housing, local government services, local tax revenues, transportation, and other relevant factors within the project area. (18 C.F.R. § 380.12(g)(2-6))	5.4 through 5.9
Additional Information Often Missing and Resulting in Data Requests	
Evaluate the impact of any substantial immigration of people on governmental facilities and services and describe plans to reduce the impact on local infrastructure.	5.4
Describe on-site manpower requirements, including the number of construction personnel who currently reside within the impact area, would commute daily to the site from outside the impact area, or would relocate temporarily within the impact area.	5.4
Estimate total worker payroll and material purchases during construction and operation.	5.4
Determine whether existing housing within the impact area is sufficient to meet the needs of the additional population.	5.4
Describe the number and types of residences and businesses that would be displaced by the project, procedures to be used to acquire these properties and types and amounts of relocation assistance payments.	TBD
Conduct a fiscal impact analysis evaluating incremental local government expenditures in relation to incremental local government revenues that would result from construction of the project. Incremental expenditures include, but are not limited to, school operating costs, road maintenance and repair, public safety and public utility costs.	5.4

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APPENDIX B	Technical Memorandum, Historical Overview of the Alaska Economy
APPENDIX C	Technical Memorandum, Long-Term Modeling Assumptions (to be provided in a subsequent draft of this Resource Report)
APPENDIX D	Subsistence and Traditional Knowledge Draft Existing Data Compilation Report— filed as PRIVILEGED AND CONFIDENTIAL—DO NOT RELEASE
APPENDIX E	Health Impact Assessment (to be provided in a subsequent draft of this Resource Report)

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ACRONYMS AND ABBREVIATIONS

ABBREVIATION	DEFINITION
Abbreviations for Units of Measurement	
°C	degrees Celsius
°F	degrees Fahrenheit
BSCF/D	billion standard cubic feet per day
cfs	cubic feet per second
cm	centimeters
dB	decibels
dBA	A-weighted decibels
ft	feet
g	grams
gpm	gallons per minute
ha	hectare
hp	horsepower
Hz	hertz
in	inches
kg	kilogram
kHz	kilohertz
kW	kilowatts
L _{dn}	day-night sound level
L _{eq}	equivalent sound level
L _{max}	maximum sound level
m ³	cubic meters
Ma	mega-annum (millions of years)
mg	milligrams
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MGD	million gallons per day
mm	millimeters
MMBtu/hr	million British thermal units per hour
MMSCF/D	million standard cubic feet per day
MPH	miles per hour
MMTA	million metric tons per annum
ng	nanograms
ppb	parts per billion
ppbv	parts per billion by volume
ppm	parts per million
ppmv	parts per million by volume
Psig	pounds per square inch gauge
rms	root mean square
SPL	sound pressure level
tpy	tons per year

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ABBREVIATION	DEFINITION
µg	microgram
µg/kg	micrograms per kilogram
µPa	micropascals
Other Abbreviations	
§	section or paragraph
AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
ACC	Alaska Conservation Corps
ACEC	Areas of Critical Environmental Concern
ACP	Arctic Coastal Plain
ACRC	Alaska Climate Research Center
ACS	U.S. Census, American Community Survey
AD	aggregate dock
ADCCED	Alaska Department of Commerce, Community, and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADGGS	Alaska Division of Geological and Geophysical Surveys
ADM	average daily membership
ADNR	Alaska Department of Natural Resources
ADOLWD	Alaska Department of Labor and Workforce Development
ADOT&PF	Alaska Department of Transportation and Public Facilities
AEIC	Alaska Earthquake Information Center
AES	Arctic Slope Regional Corporation Energy Service
AGDC	Alaska Gasline Development Corporation
AGPPT	Alaska Gas Producers Pipeline Team
AHPA	Alaska Historic Preservation Act
AHRS	Alaska Heritage Resources Survey
AIDEA	Alaska Industrial Development and Export Authority
AKNHP	Alaska Natural Heritage Program
AMP	approximate mile post
ANCSA	Alaska Native Claims Settlement Act
ANGPA	Alaska Natural Gas Pipeline Act
ANGTS	Alaska Natural Gas Transportation System
ANILCA	Alaska National Interest Lands Conservation Act
ANIMIDA	Arctic Nearshore Impact Monitoring in the Development Area
ANS Task Force	Aquatic Nuisance Species Task Force
ANVSA	Alaska Native Village Statistical Area
AOGCC	Alaska Oil and Gas Conservation Commission
AOI	Area of Interest
APCI	Air Products and Chemicals Inc.
APDES	Alaska Pollutant Discharge Elimination System
APE	Area of Potential Effect
API	American Petroleum Institute
APP	Alaska Pipeline Project

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ABBREVIATION	DEFINITION
Applicants	ExxonMobil Alaska LNG LLC, ConocoPhillips Alaska LNG Company, BP Alaska LNG LLC, TransCanada Alaska Midstream LP, and Alaska Gasline Development Corporation
APSC	Alyeska Pipeline Service Company
AQRV	Air Quality Related Value
Arctic NWR	Arctic National Wildlife Refuge
ARD	acid rock drainage
ARDF	Alaska Resource Data File
ARPA	Archaeological Resources Protection Act of 1979
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
ASAP	Alaska Stand Alone Pipeline
ASME	American Society of Mechanical Engineers
ASOS	Automated Surface Observation System
ASRC	Arctic Slope Regional Corporation
ATC	Allakaket Tribal Council
ATWS	additional temporary workspace
AWOS	Automated Weather Observing System
B.C.	British Columbia
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BIA	U.S. Department of the Interior, Bureau of Indian Affairs
BLM	U.S. Department of the Interior, Bureau of Land Management
BMP	best management practices
BOD ₅	biochemical oxygen demand
BOEM	U.S. Department of the Interior, Bureau of Ocean Energy Management
BOG	boil-off gas
BP	Before Present
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
CAMA	Central Arctic Management Area
CCP	Comprehensive Conservation Plans
CDP	Census Designated Place
CEA	Chugach Electric Association
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGF	Central Gas Facility
CGP	Construction General Permit
CH ₄	methane
CHA	Critical Habitat Area
CIRCAC	Cook Inlet Regional Citizens Advisory Council
CIRI	Cook Inlet Region Inc.
CLG	Certified Local Government
CO	carbon monoxide

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ABBREVIATION	DEFINITION
CO ₂	carbon dioxide
CO ₂ e	total greenhouse gas emissions, in CO ₂ -equivalent global warming potential
COC	Certificate of Compliance
CONUS	Continental U.S.
COOP	National Weather Service, Cooperative Observer Program
CPCN	Certificate of Public Convenience and Necessity
CRA	Certificate of Reasonable Assurance
CSD	Contaminated Sites Database
CSP	Contaminated Sites Program
CSU	conservation system units
CV	coefficient of variation
CWA	Clean Water Act
DB	Denali Borough
DEM	Digital Elevation Model
DGGS	ADNR Division of Geological and Geophysical Surveys
DH	dock head
DHSS	Alaska Department of Health and Social Services
DMLW	Alaska Department of Natural Resources, Division of Mining, Land, and Water
DPS	Distinct Population Segment
DWPP	Drinking Water Protection Program
EDA	U.S. Department of Commerce, Economic Development Administration
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPRP	Emergency Preparedness and Response Plan
ERL	Environmental, Regulatory and Lands
ERMA	Extended Recreation Management Areas
ESA	Endangered Species Act
ESD	Emergency Shut Down
ESU	Evolutionary Significant Unit
FAA	U.S. Department of Transportation, Federal Aviation Administration
FCC	Federal Communications Commission
FE	U.S. Department of Energy, Office of Fossil Energy
FEED	front-end engineering design
FEIS	Final Environmental Impact Statement
FEMA	U.S. Department of Homeland Security, Federal Emergency Management Agency
FERC	U.S. Department of Energy, Federal Energy Regulatory Commission
FERC Plan	FERC Erosion Control, Revegetation, and Maintenance Plan
FERC Procedures	FERC Wetland and Waterbody Construction and Mitigation Procedures
FLPMA	Federal Land Policy and Management Act (of 1976) BLM
FMP	Fisheries Management Plan

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ABBREVIATION	DEFINITION
FNSB	Fairbanks North Star Borough
FR	Federal Regulation
GDP	Gross Domestic Product
GHG	greenhouse gases
GIS	geographic information system
GMU	Game Management Units
GP	General Permit
GRI	Gas Research Institute
GTP	gas treatment plant
GWP	Global Warming Potential
H ₂ S	hydrogen sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	Hazardous Air Pollutant
HAPC	Habitat Areas of Particular Concern
HCA	High Consequence Area
HDD	horizontal directional drill
HDMS	Hazard Detection and Mitigation System
HGM	hydrogeomorphic
HLV	heavy lift vessel
HMR	Hazardous Materials Regulations
HRS	Hazard Ranking System
IBA	Important Bird Areas
ICS	Incident Command System
IHA	Incidental Harassment Authorization
IHLC	Inupiat History, Language, and Culture
ILI	In-line Inspection
IMP	Integrity Management Plan
IP	Individual Permit
ISO	International Organization for Standardization
JPO	State and Federal Joint Pipeline Office
kbpd	thousand barrels per day
KCC	Kuparuk Construction Camp
KOP	key observation points
KPB	Kenai Peninsula Borough
KTC	Kuparuk Transportation Company
LiDAR	light detection and ranging
Liquefaction Facility	natural gas liquefaction
LLC	Limited Liability Company
LNG	liquefied natural gas
LNGC	liquefied natural gas carrier
LOA	Letter of Authorization
LOD	Limits of Distribution

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ABBREVIATION	DEFINITION
LP	Limited Partnership
LPG	liquefied petroleum gas
LUP	Land Use Permit
LUST	Leaking Underground Storage Tanks
MACT	maximum achievable control technology
Mainline	An approximately 800-mile-long, large-diameter gas pipeline
MAOP	maximum allowable operating pressure
MARPOL	Marine Pollution Protocol
MBTA	Migratory Bird Treaty Act
MCD	marine construction dock
MHHW	mean higher high water
MHW	mean high water
ML&P	Anchorage Municipal Light and Power
MLA	Mineral Leasing Act
MLBV	Mainline block valve
MLLW	mean lower low water
MLW	mean low water
MMPA	Marine Mammal Protection Act
MMS	Mainline Meter Station
MOE	margin of error
MOF	material offloading facility
MP	Mainline milepost
MPRSA	Marine Protection Research and Sanctuaries Act of 1972
MSB	Matanuska-Susitna Borough
MSCFD	Thousand standard cubic feet per day
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAS	nonindigenous aquatic species
NCC	national certification corporation
NCDC	National Climatic Data Center
NDE	non-destructive examination
NEP	non-essential experimental population
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NGA	Natural Gas Act
NHPA	National Historic Preservation Act of 1996, as amended
NID	Negligible Impact Determination
NLURA	Northern Land Use Research Alaska, LLC
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NOAA	National Oceanographic and Atmospheric Administration

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ABBREVIATION	DEFINITION
NOI	Notice of Intent
North Slope	Alaska North Slope
NPDES	National Pollutant Discharge Elimination Systems
NPL	National Priority List
NPP	National Park and Preserve
NPR-A	National Petroleum Reserve – Alaska
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise-Sensitive Areas
NSB	North Slope Borough
NSPS	New Source Performance Standards
NTC	national training center
NTP	Notice to Proceed
NVIC	Navigation and Vessel Inspection Circular
NWA	Northwest Alaska Pipeline
NWI	National Wetland Inventory
NWR	National Wildlife Refuge
O ₃	Ozone
OC	open-cut
OCS	Outer Continental Shelf
OD	outside diameter
OEP	FERC, Office of Energy Projects
OHA	ADNR Division of Parks and Outdoor Recreation, Office of History and Archaeology
ONA	Outstanding Natural Area
OPMP	ADNR, Office of Project Management and Permitting
OU	Operating unit
PAC	potentially affected community
Pb	the element lead
PBTL	Prudhoe Bay Gas Transmission Line
PBU	Prudhoe Bay Unit
PCB	polychlorinated biphenyl
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM _{2.5}	particulate matter having an aerodynamic diameter of 2.5 microns or less
PM ₁₀	particulate matter having an aerodynamic diameter of 10 microns or less
PMP	Point Thomson Gas Transmission Line milepost
POC	Plan of Cooperation
POD	Plan of Development
Project	Alaska LNG Project
PRPA	Paleontological Resources Preservation Act
PSD	Prevention of Significant Deterioration
PTTL	Point Thomson Gas Transmission Line
PTU	Point Thomson Unit

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ABBREVIATION	DEFINITION
PWS	public water supply
Q&A	question and answer
RCA	Regulatory Commission of Alaska
RCRA	Resource Conservation and Recovery Act
RNA	Research Natural Area
ROD	Record of Decision
ROE	right-of-entry
ROW	right-of-way
RR	Resource Report
SCC	Deadhorse Airport
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SGR	State Game Refuge
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SMA	Special Management Areas
SRMA	Special Recreation Management Areas
SO ₂	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure Plan
SPCO	State Pipeline Coordinator's Office
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SPMT	self-propelled module transporters
SRA	State Recreation Area
SRR	State Recreation River
STATSGO	State Soil Geographic
STATSGO2	State Soil Geographic2 – General Soils Map of Alaska & Soils Data (2011)
SWAPA	Southwest Alaska Pilots Association
SWPPP	Stormwater Pollution Prevention Plan
TAHC	total aliphatic hydrocarbons
TAPS	Trans-Alaska Pipeline System
TBD	To be determined
TCC	Tanana Chiefs Conference
The Applicants' Plan	Applicants' Upland Erosion Control, Revegetation, and Maintenance Plan
The Applicants' Procedures	Applicants' Wetland and Waterbody Construction, and Mitigation Procedures
TPAH	total polycyclic aromatic hydrocarbons
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
TSD	tug support dock
TSS	total suspended solids
UCIDA	United Cook Inlet Drift Association
UIC	Underground Injection Control
U.S.	United States
U.S.C.	U.S. Code

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ABBREVIATION	DEFINITION
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USDHHS	U.S. Department of Health and Human Services
USDOE	U.S. Department of Energy
USDOI	U.S. Department of the Interior
USDOT	U.S. Department of Transportation
USDW	underground sources of drinking water
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VPSO	Village Public Safety Officer
VRM	Visual Resource Management Methodology
VSM	Vertical Support Members
WELTS	Well Log Tracking System
WRCC	Western Regional Climate Center
WSA	Waterway Suitability Assessment
WSR	Wild and Scenic Rivers

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Information in this draft Resource Report, including maps, is preliminary and may change during Project pre-filing. Updated information will be provided in the subsequent draft and final versions of the Resource Reports.

5.0 RESOURCE REPORT NO. 5 – SOCIOECONOMICS

5.1 INTRODUCTION

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LP (Applicants) plan to construct one integrated LNG Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunity for in-state deliveries of natural gas.

The Natural Gas Act (NGA), 15 U.S.C. § 717a(11) (2006), and FERC regulations, 18 C.F.R. § 153.2(d) (2014), define “LNG terminal” to include “all natural gas facilities located onshore or in State waters that are used to receive, unload, load, store, transport, gasify, liquefy, or process natural gas that is ... exported to a foreign country from the United States.” With respect to this Project, the “LNG terminal” includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 800-mile, large diameter gas pipeline (Mainline); a gas treatment plant (GTP) on the North Slope; a gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and a gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL). All of these facilities are essential to export natural gas in foreign commerce.

These components are shown in Resource Report No. 1, Figure 1.1-1, and their current basis for design is described below.

The new Liquefaction Facility will be constructed on the eastern shore of Cook Inlet in the Nikiski area of the Kenai Peninsula. The Liquefaction Facility will include the structures, equipment, underlying access rights and all other associated systems for pre-processing (other than that performed by the GTP) and liquefaction of natural gas, as well as storage and loading of LNG, including terminal facilities (dock) and auxiliary marine vessels used to support marine terminal operations (excluding LNG carriers). The Liquefaction Facility will include three liquefaction trains combining to process up to approximately 20 million metric tons per annum (MMTPA) of LNG. Three 160,000 cubic meter (m³) tanks will be constructed to store the LNG. The Liquefaction Facility will be capable of accommodating two LNG carriers. The size range of LNG carriers that the Liquefaction Facility will accommodate will be determined through further engineering study and consultation with the United States Coast Guard (USCG) as part of the Waterway Suitability Assessment (WSA) process.

In addition to the Liquefaction Facility, the LNG Terminal will include the following interdependent facilities:

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- Mainline: A new large-diameter natural gas pipeline approximately 800 miles in length will extend from the Liquefaction Facility to the GTP on the North Slope, including the structures, equipment, and all other associated systems. The diameter of the pipeline has not been finalized but for the purpose of these Resource Reports a 42-inch diameter pipeline is assumed. The Mainline will include compressor stations, heater stations, meter stations, and various mainline block valves; pig launcher and receiver facilities; and associated ancillary and auxiliary facilities. Ancillary and auxiliary facilities will include additional temporary work spaces, access roads, helipads, construction camps, pipe storage areas, contractor yards, material extraction sites, and material disposal sites. Along the Mainline route, there will be at least five off-take interconnection points to allow for the opportunity for future in-state deliveries of natural gas. The size and location of such interconnection points are unknown at this time. None of the potential third-party facilities used to condition, if required, or move natural gas away from these off-take points will be part of the Project.
- GTP: A new GTP and associated facilities in the Prudhoe Bay area will receive natural gas from the PBU Gas Transmission Line and the PTU Gas Transmission Line. The GTP will treat/process the natural gas for delivery into the Mainline. The Project also includes a new pipeline that will deliver natural gas processing byproducts from the GTP to the PBU.
- PBU Gas Transmission Line: A new natural gas transmission line will extend approximately one mile from the inlet flange of the GTP to the outlet flange of the PBU gas production facility.
- PTU Gas Transmission Line: A new natural gas transmission line will extend approximately 60 miles from the inlet flange of the GTP to the outlet flange of the PTU gas production facility.
- Ancillary Facilities: Existing State of Alaska transportation infrastructure will be used during the construction of these new facilities including ports, airports, roads, and airstrips (potentially including previously abandoned airstrips). The potential need for new infrastructure and modifications or additions to these existing in-state facilities is under evaluation. The Liquefaction Facility, Mainline, and GTP will require the construction of material offloading facilities.

Draft Resource Report No. 1, Appendices A and B contain general maps of the Project footprint. Detailed plot plans will be developed during the pre-front-end engineering and design (Pre-FEED) process and will be provided to the Commission in a subsequent draft of Resource Report No. 1. An update to the current list of affected landowners is being filed under separate cover as privileged and confidential information.

Outside the scope of the Project, but in support of, or related to, the Project, additional facilities or expansion/modification of existing facilities will be needed or may be constructed. These other projects may include:

- Modifications/new facilities at the PTU;
- Modifications/new facilities at the PBU;

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- Relocation of the Kenai Spur Highway; and
- Third-party pipelines and associated infrastructure to transport natural gas from the off-take interconnection points to markets in Alaska.

5.1.1 Purpose

As required by 18 C.F.R. § 380.12, Alaska LNG Applicants have prepared this draft Resource Report in support of its application under Section 3 of the NGA to construct and operate the Project facilities. The purpose of this draft Resource Report is to:

- Describe the existing and likely (Without Project) socioeconomic conditions in the general area of the Project; and
- Describe the potential effects the Project might have on those conditions.

Specific areas addressed include the following disciplines: population, employment, housing, public services, construction payroll and material purchase, tax revenue, land use, transportation and traffic management, subsistence, health impacts, and environmental justice.

5.1.2 Agency and Organization Consultations

This section describes consultations that have been conducted to date with agencies and other interested parties to the Project. As Project details are refined in the Pre-FEED process currently underway, additional consultations will be conducted. A future draft of this Resource Report will further describe these additional consultations.

5.1.2.1 Federal Agencies

Applicable Consultations/Permits

The focus of consultation conducted for this Resource Report was on two agencies that manage lands or waters with oil and gas production, and the Federal Pipeline Coordinator's office. These entities have knowledge of anticipated and potential oil and gas activities and other industrial activity. Table 5.1.2-1 provides information on the entity, the person that was consulted, and a summary of the meeting discussion.

TABLE 5.1.2-1 Summary of Consultations with Federal Agencies				
Entity	Person	Title	Date	Summary
Bureau of Land Management	Bud C. Cribley	State Director	4-Aug-14	Discussed National Petroleum Reserve–Alaska (NPR-A) and the Integrated Activity Plan (2013), Outer Continental Shelf (OCS), the North Slope, and Ambler and Donlin mines.
Bureau of Ocean Energy Management	Jerry Brian	Economist	7-Aug-14	Discussed OCS development in the Beaufort, Chukchi, and Cook Inlet, labor resources needed to support OCS activities, and the impact of Alaska LNG on current development plans.
Federal Pipeline Coordinator	Larry Persily	Federal Pipeline Coordinator	25-Jun-14	Discussed Arctic OCS development, More Alaska Production Act, Trans-Alaska Pipeline System (TAPS), oil, and gas revenues, GTL, Offtake points, a no-action alternative to Alaska LNG, and energy costs throughout the state.

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5.1.2.2 State Agencies

Applicable Consultations/Permits

A wide range of state agencies and corporations were consulted for this Resource Report. These entities include those that understand the macroeconomic picture of the Alaska economy such as the Alaska Department of Commerce, Community, and Economic Development (ADCCED), and the Alaska Industrial Development and Export Authority (AIDEA), those focused on labor and workforce development, and several focused on specific transportation modes. In addition, two state entities engaged in the Project were consulted. Table 5.1.2-2 provides information on the entity, the person that was consulted, and a summary of the meeting discussion.

TABLE 5.1.2-2 Summary of Consultations with Alaska State Agencies				
Entity	Person	Title	Date	Summary
ADCCED	Joe Jacobsen	Division Director	20-Aug-14	Discussed the Alaskan labor pool, housing markets, taxes, and state revenues.
Alaska Department of Labor & Workforce Development (ADOLWD)	Dan Robinson	Director of Research and Analysis	24-Jul-14	Discussed techniques and methods used by ADOLWD to gather employment data and make projections. Also talked about a potential number of jobs created by Alaska LNG and how many jobs might be filled by AK residents; migration projections, and wages.
ADOLWD	Neal Fried	Economist	7-Jul-14	Discussed the future of the Alaskan economy including feasibility of proposed infrastructure projects, federal and state spending, and oil prices.
Alaska Department of Natural Resources	Joe Balash	Commissioner	3-Apr-14	Talked about the commissioner's perspective on the future of Alaska's economy with and without the Alaska LNG Project and the Governor's new advisory board.
Alaska Department of Transportation & Public Facilities (ADOT&PF)	Jeff Ottesen	Program Development Director	21-Jul-14	Reviewed ADOT&PF's existing infrastructure and projects planned to take place over the next 10 years. Mining, the Knik Arm Bridge, roads to resources, and the future with and without the Alaska LNG Project were also topics discussed.
Alaska Gasline Development Corporation (AGDC)	Frank Richards	Vice President Engineering and Program Management	19-Aug-14	Discussed the Alaska Stand Alone Pipeline (ASAP) Project, AGDC/TransCanada responsibilities in the Project, other proposed Alaska infrastructure projects, and global markets for LNG.
AIDEA	James Hemsath	Deputy Director	11-Jul-14	Discussed proposed pipeline projects, the Susitna-Watana Hydroelectric project, Cook Inlet gas, proposed mining projects, and the demand for energy in Alaska.
Alaska Railroad Corporation	Jim Kubitz	Vice President, Corporate Planning & Real Estate	8-Aug-14	Reviewed current Alaska Railroad operations, Fort Greely/Big Delta bridge, Port Mackenzie, the Alaska Railroad's ports and real estate, and the impact of Alaska LNG.
Ted Stevens Anchorage International Airport	John Parrott	Manager	13-Jun-14	Discussed airport's current operations, Anchorage's strategic position, surface transportation options, Flint Hills, tourism, the state budget, and economic diversification.

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5.1.2.3 Other Interested Parties

A number of meetings and interviews were held with other interested parties, including those organizations that have knowledge of specific industries that may be affected by the Project, and those with specific insights into certain parts of the Alaska economy such as Alaska Native corporations. Table 5.1.2-3 provides information on the entity, the person that was consulted, and a summary of the meeting discussion.

TABLE 5.1.2-3 Summary of Consultations with Other Interested Parties				
Entity	Person	Title	Date	Summary
Alaska Travel Industry Association	Sarah Leonard	President & Chief Executive Officer	23-Jun-14	Reviewed trends in the tourism industry and discussed potential visitor traffic issues (particularly between Talkeetna and Denali), environmental concerns, and the Susitna-Watana Dam.
Alaska Village Electric Co-operative	Meera Kohler	President & Chief Executive Officer	23-Jul-14	Discussed possible impacts of proposed projects such as the Susitna-Watana dam, Alaska LNG Project, and the influence these projects would have on rural Alaska and rural Alaskan's utilities.
Anchorage Chamber of Commerce	Andrew Halcro	President	11-Jun-14	Discussed federal spending, state revenues, gas revenues, OCS, state sales and income taxes, proposed infrastructure projects, the Port of Anchorage, the Anchorage airport, and housing.
Anchorage Economic Development Corporation	Bill Popp	President & Chief Executive Officer	6-Jun-14	Discussed Alaska's workforce, socioeconomic impacts of a large project such as Alaska LNG, skills gap, State of Alaska spending, and local versus global LNG markets.
Arctic Slope Regional Corporation (ASRC)	Jeff Kinneveauk	President & Chief Executive Officer	8-Aug-14	Discussed demand for ASRC's services, potential partnerships, non-local competition, impact on rural Alaskans, and logistical issues that Alaska LNG will have to overcome.
Chugach Electric Association	Brad Evans	Assistant Director	4-Aug-14	Discussed technological developments, job creation, Cook Inlet gas, LNG prices, heat/energy security, the Watana Dam, and other proposed infrastructure projects.
Cook Inlet Energy	JR Wilcox	President	7-Aug-14	Discussed demand for Cook Inlet gas, development plans in Cook Inlet, LNG markets, available labor force, and the potential impacts of the Project.
Cook Inlet Region Inc. (CIRI)	Ethan Schutt	Senior Vice President	23-Jul-14	Discussed CIRI's land ownership, proposed infrastructure projects, North Slope oil, Cook Inlet gas, and rural Alaska.
Copper Valley Electric Association	Robert Wilkinson	Chief Executive Officer	3-Jul-14	Reviewed current system, Allison Creek Hydro, energy demand in eastern Alaska, the Northeast Intertie, and the potential impacts of Alaska LNG in eastern Alaska.
Dan E. Dickinson, CPA	Dan Dickinson	Alaska Oil and Gas Consultant	24-Jun-14	Discussed recent oil and gas legislation, taxes, and the impact regulations have on oil and gas development.
Doyon Ltd.	Jim Mery	Senior Vice President, Lands and Natural Resources	16-Jul-14	Discussed Doyon's plans for new and on-going natural resource projects, job market, employee training plans, socioeconomic impacts on region, and the potential impacts of the Project.
Kenai Peninsula Borough	Mike Navarre, Mayor	Mayor	17-Jul-14	Discussed the economy in the Kenai Peninsula Borough, infrastructure developments in the area, what would the future look like with and without Alaska LNG.
Lynden Transportation	Jim Jansen	President & CEO	13-Jun-14	Discussed the Port of Anchorage, land availability, scheduled services, and freight flows throughout the state.

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TABLE 5.1.2-3 Summary of Consultations with Other Interested Parties				
Entity	Person	Title	Date	Summary
Totem Ocean Trailer Express (TOTE)	Renata Bennett	Market Research Manager	11-Jul-14	Discussed TOTE's current operations and future trends as well as demand from consumer market versus demand from oil and gas industry.

5.2 SOCIOECONOMIC STUDY AREA

5.2.1 Area of Interest

For the purposes of the socioeconomic analysis, the region encompassing the boroughs and census areas in which the Project components and major Project transportation routes are located is referred to as the “area of interest” (AOI) for the Project. The AOI, together with the state as a whole, comprise the socioeconomic study area. The effects of Project construction and operation in the AOI can be assessed in terms of fluctuations in employment, income, housing availability, and other factors from baseline levels within the region’s communities.

As shown in Figure 1.1-1 of Resource Report No. 1, the Liquefaction Facility would be located in the Kenai Peninsula Borough; the Mainline would traverse the Kenai Peninsula Borough, Matanuska-Susitna Borough, Denali Borough, Fairbanks North Star Borough, Yukon-Koyukuk Census Area, and North Slope Borough; and the GTP would be located in the North Slope Borough. Many of the direct socioeconomic effects of the Project would occur in the communities located in proximity to the Liquefaction Facility, in vicinity of the Mainline corridor, or in proximity to the GTP, and would result from the number of local and non-local construction workers who would work on the Project, their income and local expenditures, and their impact on traffic flow, population, housing, and public services. Other potential direct effects to communities are related to operation of the Project, such as impacts on the local economy, including increased tax revenue; increased job opportunities and income; and ongoing local expenditures during operations and maintenance of the Liquefaction Facility, Mainline, GTP, and PBTL and PTTL.

Direct effects during the construction phase of the Project also would occur in communities outside the Mainline corridor as a result of the transportation of materials and equipment to Project construction sites through Alaska’s ports and airports and along the state’s highway and railway systems. In the Mainline corridor, transportation effects would be related to increased traffic or disruption of normal traffic patterns. These transportation effects would be concentrated in specific communities in the Kenai Peninsula Borough, Matanuska-Susitna Borough, Denali Borough, Valdez-Cordova Census Area, Southeast Fairbanks Census Area, Fairbanks North Star Borough, Yukon-Koyukuk Census Area, North Slope Borough, and Municipality of Anchorage (Table 5.2.2-1). Communities along the marine corridors may also be affected by increased ship, tug and barge traffic. Additional areas may be added to this list following future development of a Project transportation plan.

Given the scale of the Project and its potential importance to the Alaska economy, the direct socioeconomic effects of the Project would also be experienced throughout the state. These statewide effects would include employment and fiscal effects. For example, a wide range of occupations are

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needed to construct and operate a natural gas pipeline, and it is likely that workers in all regions of Alaska would benefit from the additional employment opportunities created by the Project (Rae, 2009).

In addition, Alaska likely would experience indirect socioeconomic effects from the construction and operation of the Project¹. During the operations phase, the Project would provide a long-term source of revenue to Alaska state and local governments. This additional revenue would help support education, health facilities, and other public infrastructure and services in communities throughout Alaska. Indirect effects on population and economic growth are likely to be concentrated in Alaska's population and commercial centers, including Anchorage and neighboring communities in the Matanuska-Susitna and Kenai Peninsula Boroughs, and Fairbanks. Further, the opportunity created by the Project to take North Slope natural gas resources to market could result in additional exploration activity for gas reserves on the North Slope. To some extent this activity would lead to increased population, employment, and economic development in the state as a whole; however, the growth-inducing effects would likely be concentrated in North Slope Borough communities.

A key benefit of the Project is the provision of a steady source of natural gas for in-state use. The provision for off-take points allows for the opportunity to deliver natural gas to areas in Alaska that currently do not have access to this energy source, as well as increase and diversify the supply to areas that do. This gas potentially could be used for commercial, industrial, and residential heating needs, as well as for additional electric generation (Northern Economics, 2010).

5.2.2 Potentially Affected Communities

A potentially affected community (PAC) is defined as a city, census designated place (CDP), or Alaska Native village statistical area (ANVSA) in the AOI where Project-related socioeconomic impacts may reasonably be expected to occur. Not all PACs experience socioeconomic impacts of the same intensity, but it is still important to identify all communities that may possibly be affected. For the purpose of defining the socioeconomic impact area, a city, CDP, or ANVSA is considered a PAC based on one or more of the following four factors:

- Whether the city, CDP, or ANVSA is in close proximity to any major Project facility or infrastructure such as the Liquefaction Facility, Mainline, the GTP, a work camp, a compressor station, or a storage yard;
- Whether the city, CDP, or ANVSA is located on or near a transportation corridor, including a port, highway, airport, or railway used to transport Project materials, equipment, or workers;
- Whether the city, CDP, or ANVSA is a major logistical and supply center for Alaska's oil and gas industry; or
- Whether the city, CDP, or ANVSA could experience indirect socioeconomic effects as a result of the Project, such as growth-related impacts due to changes in population, employment, and economic development.

¹ NERA Economic Consulting, "Socio-Economic Impact Analysis of Alaska LNG Project"

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Table 5.2.2-1 presents a list of PACs based on the above criteria. PACs have been grouped together according to their geographic locations. The location of Project components may differ across the various alternatives considered; consequently, the geographical boundaries for the socioeconomic effects analysis may also change with the different alternatives. In particular, alternative routes have been proposed for the Mainline and for the transport of materials and equipment during Project construction. Table 5.2.2-1 includes the PACs for all alternative routes. The GTP would be located in the North Slope Borough. The Mainline would traverse the North Slope Borough, Yukon-Koyukuk Census Area, Fairbanks North Star Borough, Denali Borough, Matanuska-Susitna Borough, and Kenai Peninsula Borough. The Liquefaction Facility would be located in the Kenai Peninsula Borough. In addition, the boroughs and census areas in which Project-related transportation and economic growth effects could potentially occur are presented, with those boroughs and census areas nearest to the Project corridor and facilities listed first. PACs within each borough or census area are listed in alphabetical order.

TABLE 5.2.2-1 Alaska Boroughs, Census Areas, Cities, Census Designated Places, and Alaska Native Village Statistical Areas in the Area of Interest ^a					
Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Nonjurisdictional Facilities
North Slope Borough					Point Thomson Unit modification/new facilities
Anaktuvuk Pass				X	
Atkasuk				X	
Barrow				X	
Kaktovik				X	
Nuiqsut				X	
Point Hope				X	
Point Lay				X	
Prudhoe Bay	GTP	port/airport	X	X	Prudhoe Bay Unit modifications/new facilities
Wainwright				X	
Yukon-Koyukuk Census Area					
Coldfoot	camp, compressor station	Dalton Hwy/airport			
Livengood	camp	Dalton Hwy/airport			
Manley Hot Springs		Dalton Hwy			
Minto		Dalton Hwy			
Nenana	Mainline	Parks Hwy			
Wiseman	Mainline	Dalton Hwy			
Fairbanks North Star Borough					
Fairbanks		Parks Hwy/ Richardson Hwy/Steese Hwy/airport/railway	X	X	

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TABLE 5.2.2-1 Alaska Boroughs, Census Areas, Cities, Census Designated Places, and Alaska Native Village Statistical Areas in the Area of Interest ^a					
Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Nonjurisdictional Facilities
Denali Borough					
Anderson		Parks Hwy			
Cantwell		Parks Hwy			
Healy	Mainline	Parks Hwy			
McKinley Park	Mainline	Parks Hwy			
Matanuska-Susitna Borough					
Big Lake	Mainline	Parks Hwy			
Houston	Mainline	Parks Hwy			
Knik-Fairview		Knik–Goose Bay Rd			
Palmer		Parks Highway			
Point MacKenzie	Mainline	Knik–Goose Bay Road/port/railway			
Skwentna	Mainline				
Talkeetna	Mainline	Parks Hwy			
Trapper Creek	Mainline	Parks Hwy			
Wasilla	Mainline	Parks Hwy			
Willow	Mainline	Parks Hwy			
Kenai Peninsula Borough					
Cooper Landing		Sterling Hwy			
Kenai		Kenai Spur Hwy			
Moose Pass		Seward Hwy			
Nikiski	Liquefaction Facility	Kenai Spur Hwy	X	X	Kenai Spur Highway relocation
Salamatof		Kenai Spur Hwy			
Seward		Seward Hwy/port/railway			
Soldotna		Sterling Hwy			
Sterling		Sterling Hwy			
Tyonek	Mainline				
Municipality of Anchorage					
Anchorage		Glenn Hwy/Seward Hwy/port/airport/railway	X	X	
Eklutna ANVSA		Glenn Hwy			
Southeast Fairbanks Census Area					
Big Delta		Richardson Hwy			
Delta Junction		Richardson Hwy			
Valdez-Cordova Census Area					
Copper Center		Richardson Hwy			
Copper Center ANVSA		Richardson Hwy			

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TABLE 5.2.2-1 Alaska Boroughs, Census Areas, Cities, Census Designated Places, and Alaska Native Village Statistical Areas in the Area of Interest ^a					
Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Nonjurisdictional Facilities
Gakona		Richardson Hwy			
Gakona ANVSA		Richardson Hwy			
Glennallen		Richardson Hwy			
Gulkana		Richardson Hwy			
Gulkana ANVSA		Richardson Hwy			
Paxson		Richardson Hwy			
Tazlina		Richardson Hwy			
Tazlina ANVSA		Richardson Hwy			
Tonsina		Richardson Hwy			
Valdez		Richardson Hwy/port			
Whittier		port/railway			
Other - City of Unalaska		port			
Notes: ^a A city/CDP and the corresponding ANVSA are listed separately only if the populations of the two geographical units differ.					

5.2.3 Out-of-State Area

Alaska's oil and gas industry is projected to experience an employment gap over the next few years (Alaska Department of Labor and Workforce Development 2014a), and the Project would widen that gap. For example, the State of Alaska estimates that the number of workers required for construction of a major natural gas pipeline would be greater than what the Alaska workforce can provide (Alaska Department of Revenue 2006). Some of the jobs may need to be filled by out-of-state workers, most of whom reside in the contiguous U.S. In addition to employment effects, construction of the Project would require materials, supplies, and equipment from the rest of the U.S. and other countries.

Additional information regarding the geographic and temporal scope of the socioeconomic effects analysis can be found in Appendix A.

5.3 EXISTING CONDITIONS

This section provides an overview of existing demographic, economic, and fiscal conditions in the AOI. Data included come from a variety of local, state, and federal sources such as the 2000 U.S. Census, the 2010 U.S. Census, 2008-2012 5-year American Community Survey (ACS), Alaska Department of Labor and Workforce Development, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics and Alaska Department of Commerce, and Community and Economic Development.

The ACS was developed to obtain the same information previously collected on the long form questionnaire of the 2000 U.S. Census, but more frequently than every 10 years. In contrast to previous decennial censuses, the 2010 U.S. Census did not collect income and poverty information, so the most recent community-level data for these socioeconomic indicators is from the 2008–2012 ACS 5-year

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survey. All ACS estimates should be interpreted as average values over the designated period. The smaller overall sample size of the ACS means its estimates are subject to higher sampling error levels than estimates provided by the 2010 U.S. Census. The small populations in many communities within the AOI make it difficult to present accurate recent estimates of socioeconomic characteristics. Estimates for the populations of some small communities are subject to a high margin of error (MOE), while in other small communities there were either no sample observations or too few sample observations were available to compute an estimate.

5.3.1 Demographics

5.3.1.1 Population Size and Density

In 2010, the population of Alaska was 710,231, a 13.3 percent increase since 2000 (Table 5.3.1-1). Although Alaska went through several years of negative net migration during that period, the birth rate in those years outweighed the number of people who left the state (Alaska Department of Labor and Workforce Development, 2014a).

Nearly 80 percent of the state's population, or 555,242 people, resided in the AOI as of 2010. Within the AOI, the major populations are clustered in and around the Municipality of Anchorage and the City of Fairbanks, which together accounted for about 55 percent of the region's population.

Population growth in the AOI between 2000 and 2010 was highest by far in the Matanuska-Susitna Borough, adjacent to Anchorage. The Fairbanks North Star Borough also experienced population increases exceeding the state average. The North Slope Borough's substantial increase in population is due primarily to the inclusion of oil and gas industry workers residing in group quarters in the Prudhoe Bay CDP in the 2010 census; these workers were not counted in the 2000 census. Most of the traditional communities (i.e., communities that were not created for the sole purpose of supporting the oil industry) in the North Slope Borough lost population between 2000 and 2010.

Other boroughs and census areas within the AOI experienced moderate growth similar to the state average, with the exception of the Denali Borough and Yukon-Koyukuk Census Area, which lost population from 2000 to 2010. Residents of rural villages located on the road system in Interior Alaska appear to be migrating to Fairbanks or Southcentral Alaska in search of better employment opportunities (Williams, 2010).

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TABLE 5.3.1-1 Population and Population Density in the Study Area					
Area	Population			Population Density	
				(persons per square mile)	
	2000	2010	Percent Change 2000-2010	2000	2010
Alaska	626,932	710,231	13%	1.1	1.2
North Slope Borough	7,385	9,430	28%	0.1	0.1
Anaktuvuk Pass	282	324	15%	58.2	67.0
Atkasuk	228	233	2%	5.9	6.0
Barrow	4,581	4,212	-8%	249.0	223.6
Kaktovik	293	239	-18%	371.0	331.3
Nuiqsut	433	402	-7%	47.0	42.7
Point Hope	757	674	-11%	119.4	139.9
Point Lay	247	189	-23%	8.1	6.6
Prudhoe Bay ^a	5	2,174	43380%	0.0	5.7
Wainwright	546	556	2%	31.1	31.0
Yukon-Koyukuk Census Area	6,551	5,588	-15%	0.0	0.0
Coldfoot	13	10	-23%	0.4	0.3
Livengood	29	13	-55%	0.1	0.0
Manley Hot Springs	72	89	24%	1.3	1.6
Minto	258	210	-19%	1.9	1.6
Nenana	402	378	-6%	66.6	64.1
Wiseman	21	14	-33%	0.3	0.2
Fairbanks North Star Borough	82,840	97,581	18%	11.2	13.3
Fairbanks	30,224	31,535	4%	948.7	995.0
Denali Borough	1,893	1,826	-4%	0.1	0.1
Anderson	367	246	-33%	7.9	5.6
Cantwell	222	219	-1%	1.9	1.9
Healy	1,000	1,021	2%	1.5	1.5
McKinley Park	142	185	30%	0.8	1.0
Matanuska-Susitna Borough	59,322	88,995	50%	2.4	3.6
Big Lake	2,635	3,350	27%	20.0	28.9
Houston	1,202	1,912	59%	53.7	85.4
Knik-Fairview	7,049	14,923	112%	101.0	179.6
Palmer	4,533	5,937	31%	1,206.3	1,152.1
Point MacKenzie	111	529	377%	0.8	3.5
Skwentna	111	37	-67%	0.3	0.1
Talkeetna	772	876	13%	18.6	32.7
Trapper Creek	423	481	14%	1.2	1.5
Wasilla	5,469	7,831	43%	466.8	632.4
Willow	1,658	2,102	27%	2.4	3.0
Kenai Peninsula Borough	49,691	55,400	11%	3.1	4.0
Cooper Landing	369	289	-22%	5.6	4.4
Kenai	6,942	7,100	2%	232.2	248.3
Moose Pass	206	219	6%	11.4	12.4
Nikiski	4,327	4,493	4%	62.2	64.7

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TABLE 5.3.1-1 Population and Population Density in the Study Area					
Area	Population			Population Density	
				(persons per square mile)	
	2000	2010	Percent Change 2000-2010	2000	2010
Salamatof	954	980	3%	117.7	121.1
Seward	2,699	2,693	0%	196.0	190.8
Soldotna	3,759	4,163	11%	541.9	603.7
Sterling	4,705	5,617	19%	60.9	72.2
Tyonek	193	171	-11%	2.9	2.5
Municipality of Anchorage	260,283	291,826	12%	153.4	171.9
Eklutna ANVSA	394	54	-86%	8.0	11.9
Southeast Fairbanks Census Area	6,174	7,029	14%	0.2	0.3
Big Delta	749	591	-21%	13.6	12.9
Delta Junction	840	958	14%	48.7	56.9
Valdez-Cordova Census Area	10,195	9,636	-5%	0.3	0.3
Copper Center	362	328	-9%	26.4	26.2
Copper Center ANVSA	492	442	-10%	29.6	—
Gakona	215	218	1%	3.5	3.6
Gakona ANVSA	84	122	45%	20.0	—
Glennallen	554	483	-13%	4.9	4.2
Gulkana	88	119	35%	2.4	3.4
Gulkana ANVSA	164	136	-17%	20.0	—
Paxson	43	40	-7%	0.1	0.1
Tazlina	149	297	99%	22.7	36.1
Tazlina ANVSA	339	319	-6%	27.7	—
Tonsina	92	78	-15%	0.6	0.5
Valdez	4,036	3,976	-1%	18.2	18.4
Whittier	182	220	21%	14.5	17.9
Other - City of Unalaska	4,283	4,376	2%	38.6	39.1
Source: U.S. Census Bureau (2014a) Notes: An “—” indicates that the measure is unavailable. ^a Oil and gas industry workers residing in group quarters in the Prudhoe Bay CDP were excluded from the population count in the 2000 census.					

The average population density of the state was 1.2 persons per square mile in 2010, and the boroughs and census areas in the AOI are predominantly rural and sparsely populated. The highest population density in the AOI and the state as a whole was in the Municipality of Anchorage, with an average of 172 persons per square mile in 2010. The lowest population density in the AOI was in the Yukon-Koyukuk Census Area, which had a density of less than 0.1 persons per square mile. This census area is the largest and least populated of all the nation’s counties or equivalents (Shanks, 2013). The Denali Borough also is sparsely populated. Denali National Park accounts for 70 percent of the borough’s land area, and nearly all the borough’s residents live along a 70-mile stretch of the Parks Highway (Fried, 2009).

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5.3.1.2 Age Characteristics

Among the boroughs and census areas in the AOI, the North Slope Borough has the highest proportion of working-age (16 years and over) adults, while the Yukon-Koyukuk Census Area has the lowest (Table 5.3.1-2). The port communities of Unalaska and Whittier also have high shares of working-age adults. A smaller proportion of working-age people is fairly typical of rural areas in Alaska due to a higher birthrate and out-migration of those belonging to older age cohorts. This is also true of the North Slope Borough's traditional communities. The borough's high proportion of working-age individuals can be traced to the large oil and gas industry work camp at Prudhoe Bay (Alaska Department of Commerce, and Community and Economic Development, 2014a). Within the Fairbanks North Star Borough, the City of Fairbanks has a comparatively low median age because of the presence of the University of Alaska Fairbanks' student population. While the traditional communities in the North Slope Borough has a median age lower than that of the state, Prudhoe Bay has a relatively high median age due to the absence of families with children in this industrial enclave. The large contingent of baby boomers living in the Denali Borough resulted in the highest median age of all areas in the AOI (Fried, 2009).

Both the Kenai Peninsula Borough and Yukon-Koyukuk Census Area have larger proportions of people aged 65 or older compared to the state as a whole. The Kenai Peninsula Borough has become the "Florida of Alaska" due to its high retiree population (Shanks and Rasmussen, 2010), while the out-migration of working-age adults likely accounts for the high percentage of seniors in the Yukon-Koyukuk Census Area (Shanks, 2013).

Out-migration of working-age adults from the Yukon-Koyukuk Census Area accounts also for the large proportion of people under 16 because the young and middle-aged adults that remain have higher-than-average birth rates (Shanks, 2013). The Matanuska-Susitna Borough has the highest proportion of people under 16, likely because families in search of more affordable real estate outside Anchorage tend to gravitate toward the borough (Fried, 2010).

TABLE 5.3.1-2 Age Characteristics in the Study Area, 2010				
Area	Age (%)			Median Age
	Under 16	16-64	65 and Over	
Alaska	23.4	68.9	7.7	33.8
North Slope Borough	21.3	74.4	4.3	35.1
Anaktuvuk Pass	29.3	66.4	4.3	27
Atkasuk	36.1	57.5	6.4	24.3
Barrow	29.6	65.7	4.7	28
Kaktovik	25.5	66.6	7.9	30.5
Nuiqsut	24.6	69.4	6	25.2
Point Hope	30.1	63.7	6.2	25.3
Point Lay	27.5	68.3	4.2	25.1
Prudhoe Bay	0	97.9	2.1	49.1
Wainwright	30.4	64.2	5.4	27.6
Yukon-Koyukuk Census Area	24.4	65.4	10.2	35.3
Coldfoot	20	70	10	43
Livengood	0	84.6	15.4	50.8
Manley Hot Springs	21.3	63	15.7	49.5

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TABLE 5.3.1-2

Age Characteristics in the Study Area, 2010

Area	Age (%)			Median Age
	Under 16	16-64	65 and Over	
Minto	26.7	63.8	9.5	29.6
Nenana	19.8	65.6	14.6	48
Wiseman	21.4	71.5	7.1	28.5
Fairbanks North Star Borough	23	70.5	6.5	31
Fairbanks	23.8	68.9	7.3	27.9
Denali Borough	19.9	72.6	7.5	41.5
Anderson	17.5	73.6	8.9	45.3
Cantwell	17.4	68.9	13.7	42.7
Healy	22.2	72.3	5.5	40.1
McKinley Park	11.4	82.1	6.5	44.3
Matanuska-Susitna Borough	25.5	66.6	7.9	34.8
Big Lake	20.5	68.3	11.2	42.4
Houston	24	67.4	8.6	35.4
Knik-Fairview	29	65.2	5.8	31.2
Palmer	25.4	65	9.6	30.1
Point MacKenzie	15.9	76	8.1	32.8
Skwentna	2.7	81.1	16.2	52.8
Talkeetna	17.4	72.4	10.2	45.4
Trapper Creek	16.8	70.3	12.9	48
Wasilla	26.1	63.6	10.3	32.2
Willow	18.6	66.7	14.7	46.4
Kenai Peninsula Borough	20.6	68.1	11.3	40.6
Cooper Landing	8	62.6	29.4	55.6
Kenai	24.6	65.6	9.8	34.7
Moose Pass	21	67.6	11.4	41.5
Nikiski	23.9	66.2	9.9	39.4
Salamatof	11.8	80	8.2	38.2
Seward	13.1	77.4	9.5	38.3
Soldotna	23.7	63	13.3	36.7
Sterling	19	68.5	12.5	44.1
Tyonek	27.5	65.5	7	33.6
Municipality of Anchorage	23	69.8	7.2	32.9
Eklutna ANVSA	20.4	64.8	14.8	44.5
Southeast Fairbanks Census Area	23.1	67.5	9.4	37.4
Big Delta	24.7	66.2	9.1	40
Delta Junction	25.6	65.7	8.7	32.4
Valdez-Cordova Census Area	21.5	70.2	8.3	39.8
Copper Center	28	65.3	6.7	35.3
Copper Center ANVSA	118	297	27	36.8
Gakona	22.5	65.6	11.9	40.7
Gakona ANVSA	25	82	15	42.3
Glennallen	22.8	67.7	9.5	35.8
Gulkana	36.1	54.7	9.2	26.3

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TABLE 5.3.1-2 Age Characteristics in the Study Area, 2010				
Area	Age (%)			Median Age
	Under 16	16-64	65 and Over	
Gulkana ANVSA	45	74	17	29.3
Paxson	10	85	5	54
Tazlina	21.2	67	11.8	38.5
Tazlina ANVSA	72	212	35	36.8
Tonsina	9	82	9	49.3
Valdez	22.3	72.2	5.5	36.7
Whittier	12.3	75.4	12.3	48
Other - City of Unalaska	12	85.3	2.7	40.7
Source: U.S. Census Bureau (2014a)				

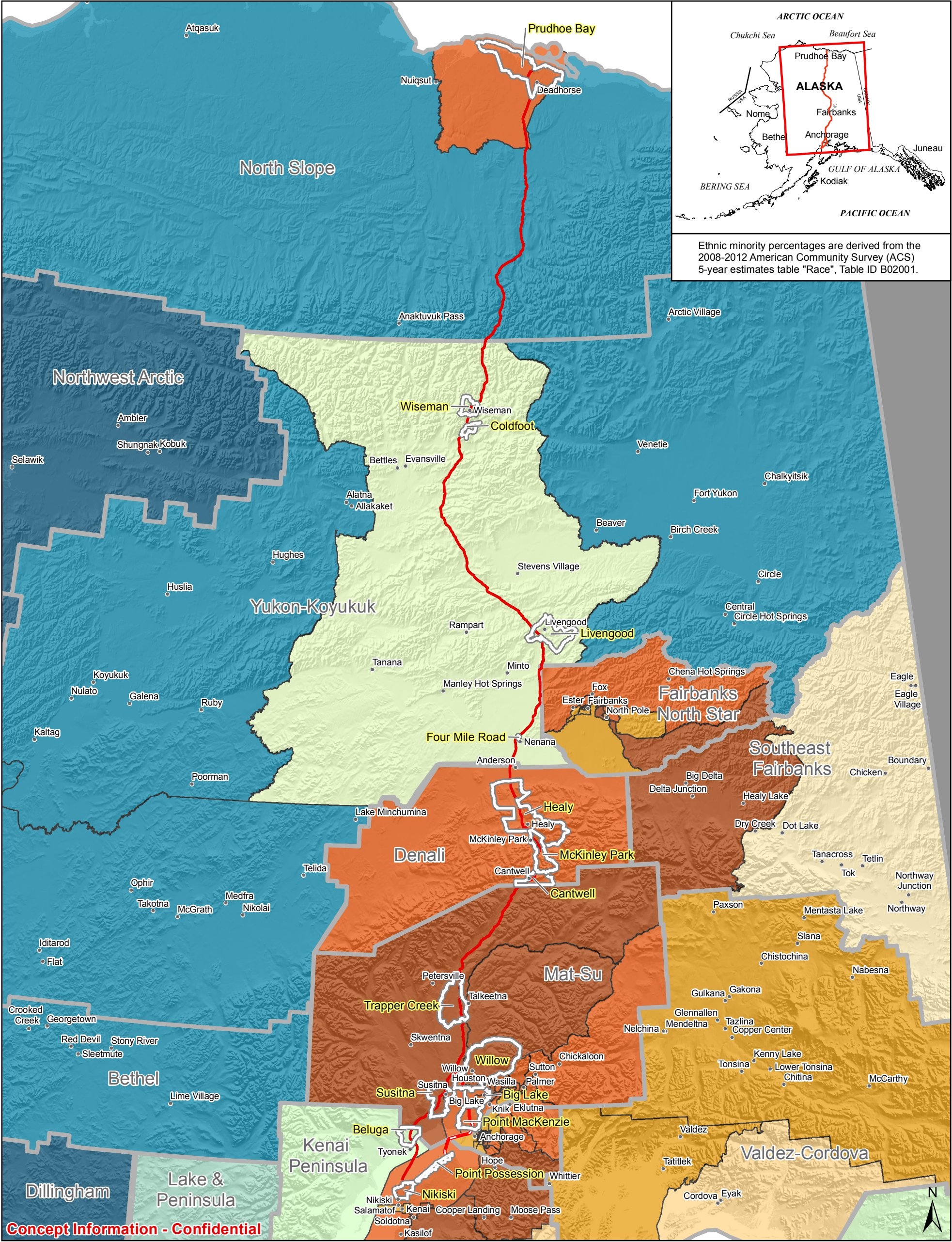
5.3.1.3 Race and Ethnicity

Whites comprise the largest racial grouping in Alaska, followed by Alaska Native/American Indians, the vast majority of whom are Alaska Native (Table 5.3.1-3). Multi-racial individuals were the next largest group in the AOI, followed by those who identified as Asian, Hispanic/Latino, and Black/African American. Larger populations tend to correspond with lower proportions of Alaska Native residents. Places with more than 10,000 residents were only 8 percent Alaska Native, while places with less than 2,500 were over 40 percent Alaska Native (Goodman, 2011). Figure 5.3.1-1 shows the percentage of the average 2008-2012 population in the AOI and adjacent regions of the state that was a racial minority (non-white). Census tracts are the smallest geographic level of census data for which complete and reliable race and ethnicity estimates are available from the American Community Survey.

Figure 5.3.1-2 shows the percent of the average 2008-2012 population that reported they were of Hispanic or Latino origin. Because persons of Hispanic or Latino origin can be of any race, the data are presented in a separate figure to avoid double counting. Persons of Hispanic or Latino origin are a relatively low percent of the population in most of the AOI except in and around the population centers of Anchorage and Fairbanks. Additional detail on race and ethnicity is presented in Table 5.3.1-3.

Within the AOI, the Yukon-Koyukuk Census Area and North Slope Borough has the highest non-white populations due to a large number of predominantly Alaska Native communities in those areas. Residents of the Yukon-Koyukuk Census Area are mainly Athabaskan, while North Slope Borough residents are primarily Iñupiat.

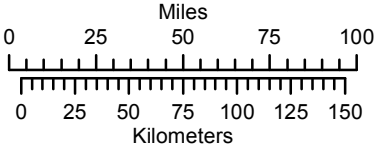
Whites make up the majority of the populations in the Kenai Peninsula Borough, Matanuska-Susitna Borough, Denali Borough, and Fairbanks North Star Borough. The Denali Borough has the lowest minority population among the boroughs and census areas in the AOI. Minority and white populations in the cities of Fairbanks and Anchorage are close to the state averages.



Ethnic minority percentages are derived from the 2008-2012 American Community Survey (ACS) 5-year estimates table "Race", Table ID B02001.

- LEGEND**
- 2010 Census Tracts with Percentages of Ethnic Minorities
- | | | |
|-----------|-----------|------------|
| 0% - 10% | 40% - 50% | 80% - 90% |
| 10% - 20% | 50% - 60% | 90% - 100% |
| 20% - 30% | 60% - 70% | |
| 30% - 40% | 70% - 80% | |

- | | |
|--|---|
| | 2010 Census Designated Places Along Pipeline Study Corridor |
| | Alaska Borough and Census Area Boundaries |
| | Pre-FEED Pipeline Study Corridor Rev A (8/5/2014) |
| | Alternate Pre-FEED Pipeline Study Corridor Rev A (8/5/2014) |



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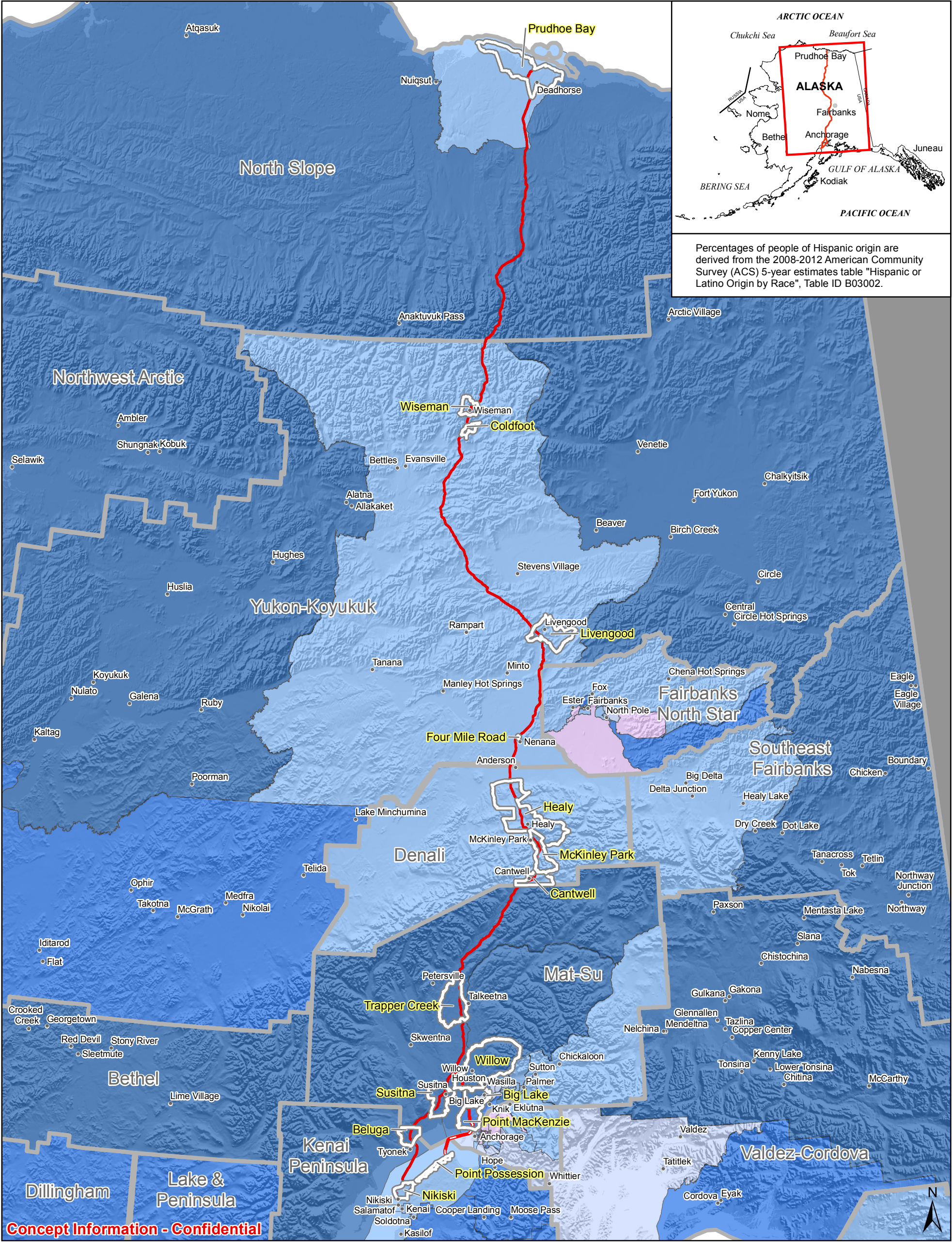
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DESIGN
TCS

APPR.

PERCENT ETHNIC MINORITIES BY CENSUS TRACT, AVERAGE 2008-2012

PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
AK 4	NAD83	URS ALASKA	5.3.1-1	
SCALE	DATE	PROJECT NUMBER	ORIG. PAGE SIZE	
1:3,500,000	18 Dec 2014	26221301	11 X 17	



LEGEND

2010 Census Tracts with Percentages of People of Hispanic Origin

0% - 1%	10% - 15%	2010 Census Designated Places Along Pipeline Study Corridor
1% - 2%	15% - 20%	Alaska Borough and Census Area Boundaries
2% - 5%	20% +	Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)
5% - 10%		Alternate Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)

Miles

0 25 50 75 100

Kilometers

0 25 50 75 100 125 150

ALASKA LNG			PERCENT HISPANIC POPULATION BY CENSUS TRACT, AVERAGE 2008-2012			
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			CHECK	5.3.1-2		
			DESIGN	11 X 17		
			APPR.			
AK 4			18 Dec 2014			
1:3,500,000			26221301			

I:\26221163 SCLNG Studies\10 - Geospatial\10.06 - MXD\2014 Reporting\NE\Figure 5.3.1-2 Hispanic Population.mxd

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TABLE 5.3.1-3

Race and Ethnicity in the Study Area, Average 2008-2012

Area	White ^a		Black or African American ^b		Alaska Native and American Indian ^b		Native Hawaiian and Other Pacific Islander ^b		Asian ^b		Some Other Race		Hispanic or Latino ^c	
	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)
Alaska	67.2	0.2	4.9	0.1	19.4	0.1	1.5	0.1	7	0.1	1.6	0.1	5.7	0.1
North Slope Borough	32.3	0.5	1.2	0.8	59.5	0.9	2	0.6	5.2	0.2	1.4	0.6	2.8	—
Anaktuvuk Pass	4.7	5.1	5.2	4.8	93.6	5.2	0	6.3	0	6.3	0	6.3	0	6.3
Atkasuk	6.6	7.4	0	7.5	93.4	7.4	0	7.5	0	7.5	0	7.5	0	7.5
Barrow	25.4	7.4	1.4	1.6	59.1	7.7	3.6	1.2	10.1	1.5	2.4	1.3	5	1.3
Kaktovik	5	4.8	0	8.3	95	4.8	0	8.3	0	8.3	0	8.3	0	8.3
Nuiqsut	9.9	9.7	0.6	0.8	89.5	9.7	0	4.5	0	4.5	0	4.5	0	4.5
Point Hope	7.5	4.4	2.8	2.2	88.5	5.9	2.9	3.5	3.4	4.6	0	2.5	0.1	0.3
Point Lay	26.9	19.8	0	7.2	73.1	19.8	0	7.2	0	7.2	0	7.2	0	7.2
Prudhoe Bay	87.7	5.3	0.4	0.9	9.5	4.9	0	1.4	2	3.1	0.7	1.2	2.6	3.1
Wainwright	6.4	6.7	0	3.4	93.6	6.7	0	3.4	0	3.4	0	3.4	0	3.4
Yukon-Koyukuk Census Area	21.9	0.2	0.6	0.3	76	0.8	0.6	0.7	0.6	0.6	0.7	0.4	1.2	—
Coldfoot	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Livengood	100	37.6	0	37.6	0	37.6	0	37.6	0	37.6	0	37.6	0	37.6
Nenana	33.7	16.2	0	21.5	50	23.5	0	21.5	0	21.5	16.3	15.3	16.3	15.3
Wiseman	2.1	2.3	0	9	97.9	2.3	0	9	0	9	0	9	0	9
Nenana	52.3	9	2.1	1.6	45.6	9.3	0	4.7	0	4.7	0	4.7	0.8	1.2
Wiseman	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fairbanks North Star Borough	77.9	0.4	5.8	0.2	10.9	0.2	0.8	0.2	4.1	0.2	1.3	0.4	6	—
Fairbanks	68.6	2.3	11.4	1.4	12.4	1.8	1.5	0.5	5.2	1.1	2	0.7	7.9	1.3
Denali Borough	87.5	6.4	1.1	1	6.1	3.4	0	1.2	5.2	6.8	0.2	0.3	2.2	2.3
Anderson	94.2	4	2.2	2.6	2.7	2.6	0	6	0	6	0.8	1.6	1.9	4.3
Cantwell	76.1	12.3	0	11.7	23.3	12.2	0	11.7	0.6	1.5	0	11.7	0	11.7
Healy	85.6	11.3	0.6	1.1	3.9	4.4	0	2.3	10	12.2	0	2.3	2.3	3.5
McKinley Park	91.9	11.4	2.2	4.6	5.8	11.4	0	6.1	0	6.1	0	6.1	3.6	8.9

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TABLE 5.3.1-3

Race and Ethnicity in the Study Area, Average 2008-2012

Area	White ^a		Black or African American ^b		Alaska Native and American Indian ^b		Native Hawaiian and Other Pacific Islander ^b		Asian ^b		Some Other Race		Hispanic or Latino ^c	
	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)
Matanuska-Susitna Borough	85.2	0.3	1.8	0.1	10	0.1	0.7	0.2	2.3	0.1	0.8	0.2	3.8	—
Big Lake	81.6	6.4	1.5	1.8	14.3	5.6	1.7	1.3	0.9	0.9	0.7	0.9	3.6	2.1
Houston	87	4.2	1.1	1.2	12.2	4.1	0.2	0.3	0	1.1	0	1.1	1.6	1.3
Knik-Fairview	82.9	2.7	1.8	1	11.6	2.5	1	1	4.6	2.2	0.1	0.1	3.1	1.8
Palmer	79	3	2.2	1	15.2	2.6	0.8	0.5	2.1	1	1.9	1.3	5.9	1.6
Point MacKenzie	72.7	14.9	4.9	4	21.9	14.8	0	5.4	0.5	1.1	0	5.4	0.2	0.6
Talkeetna	95.2	4.3	0	4.2	3.3	4.2	0	4.2	1.3	2	0.2	0.4	0.2	0.4
Trapper Creek	100	4.6	0	4.6	0	4.6	0	4.6	0	4.6	0	4.6	0	4.6
Wasilla	82.7	3.5	2.5	1.3	11.7	3.1	0.3	0.4	3.2	1.8	0.1	0.2	4.2	2.1
Willow	95.5	3.3	0	1.1	2.7	1.9	1.7	2.5	0	1.1	0	1.1	0.7	1
Kenai Peninsula Borough	84.8	0.3	0.9	0.1	11.7	0.3	0.3	0.2	2.1	0.2	0.8	0.3	3.1	—
Cooper Landing	100	7.2	0	7.2	0	7.2	0	7.2	0	7.2	0	7.2	0	7.2
Kenai	79.8	3.4	2.2	1	16.1	3.4	0	0.1	1.2	0.8	1	0.8	2.8	1.4
Moose Pass	100	6.3	0	6.3	0	6.3	0	6.3	0	6.3	0	6.3	0	6.3
Nikiski	87.1	4.3	0.9	1.1	11.2	4.1	0.1	0.3	0.4	0.6	1.5	1.5	5.4	4.1
Salamatof	77.1	6.6	2	1.6	18	5.3	2.1	3.4	0.5	0.7	1	1.2	2.4	2
Seward	62.6	7.4	2.5	1.1	26	6	0.3	0.6	8.7	6.6	0	0.8	2.1	2
Soldotna	83.7	4	0.9	0.9	12.7	3.9	0.3	0.3	2.2	1.5	1.1	1	2.4	1.6
Sterling	96.7	1.9	0	0.4	2.9	1.9	0	0.4	0.4	0.4	0	0.4	1.8	1.4
Tyonek	2.4	3.1	0	7.4	97.6	3.1	0	7.4	0	7.4	0	7.4	0	7.4
Municipality of Anchorage	66.8	0.3	8.3	0.3	12.4	0.2	2.6	0.1	10.2	0.1	2.1	0.3	7.7	—
Eklutna ANVSA	24.3	20.5	0	26.9	72.9	21.2	0	26.9	2.9	5.4	0	26.9	0	26.9
Southeast Fairbanks Census Area	80.9	0.7	1.6	0.2	15	0.2	0.4	0.5	1.4	0.1	0.7	0.6	3.6	—
Big Delta	94.4	4.4	0.3	0.8	4.9	4.3	0	2.6	0.3	0.5	0	2.6	5.8	4.2

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TABLE 5.3.1-3

Race and Ethnicity in the Study Area, Average 2008-2012

Area	White ^a		Black or African American ^b		Alaska Native and American Indian ^b		Native Hawaiian and Other Pacific Islander ^b		Asian ^b		Some Other Race		Hispanic or Latino ^c	
	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)	(%)	MOE (+/-)
Delta Junction	93.5	5.5	0	3.3	4.2	3.7	0	3.3	2.3	3.4	0	3.3	5.1	5
Valdez-Cordova Census Area	73.7	1.7	0.5	0.5	19.3	0.7	0.3	0.3	4.8	0.3	1.4	1.4	3.7	—
Copper Center	53.3	14.6	0.3	1.3	46.7	14.6	0	6.2	0	6.2	0	6.2	1.1	2.7
Copper Center ANVSA	59.5	12.7	0.2	1	40.5	12.7	0	4.6	0	4.6	0	4.6	0.8	2
Gakona	79.5	15.4	0	9.5	20.5	15.4	0	9.5	0	9.5	0	9.5	9.4	15.5
Gakona ANVSA	71.6	22.3	0	14.7	28.4	22.3	0	14.7	0	14.7	0	14.7	14.9	22.1
Glennallen	37.2	24.8	0	14.1	62.8	24.8	0	14.1	0	14.1	0	14.1	0	14.1
Gulkana	32.2	17.5	0	14.2	67.8	17.5	0	14.2	0	14.2	0	14.2	0	14.2
Gulkana ANVSA	98.1	2.7	0	4.1	1.9	2.7	0	4.1	0	4.1	0	4.1	0	4.1
Paxson	100	58.2	0	58.2	0	58.2	0	58.2	0	58.2	0	58.2	0	58.2
Tazlina	73.9	9.5	0	7.2	26.1	9.5	0	7.2	0	7.2	0	7.2	1	2.5
Tazlina ANVSA	74.9	9.2	0	7	25.1	9.2	0	7	0	7	0	7	1	2.4
Tonsina	45.1	30.1	0	26.6	54.9	30.1	0	26.6	0	26.6	0	26.6	0	26.6
Valdez	79.8	5.3	0.7	0.9	14.7	3.8	0.2	0.3	1.5	1.4	3.2	3.3	7.1	2.1
Whittier	78.4	10.8	0	9.6	14	10.1	3.6	5.2	4.1	5.9	0	9.6	5.4	9.1
Other -- City of Unalaska	35.4	2.4	6.3	2.2	8.1	1.7	2.3	0.9	38.7	1.7	10.7	1.8	15.7	1.2

Source: U.S. Census Bureau (2014c)

Notes: An “—” indicates that the measure is unavailable

^a Alone

^b Alone or in combination with one or more other races

^c Hispanic or Latino can be of any race

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5.3.2 Economy

This section describes the AOI in terms of employment and income, and the primary economic drivers in the AOI and state of Alaska, and provides additional information on rural Alaska and the Alaska Native population in the AOI.

5.3.2.1 Employment and Income

This subsection provides information on the labor force number and composition, and per capita income and unemployment in the AOI.

Workforce Number and Composition

The total number of working-age residents in the AOI is 394,806 people, representing about 78 percent of working-age people statewide. As shown in (Table 5.3.2-1), top employment sectors in the AOI include health care and education, government, leisure and hospitality, and trade, transportation and utilities. Over the past decade, health care created more new jobs than any other sector of Alaska's economy, as an increasing population of senior citizens drove up demand for health services (Stimpfle and Rasmussen, 2011). The local, state, or federal government is among the top three employers in eight of the nine boroughs and census areas in the AOI, reflecting the continued importance of the public sector in Alaska.

TABLE 5.3.2-1 Average Annual Employment and Top Three Industries in the Study Area, 2012		
Area	Average Annual Employment	Top Industries by Employment (% of total)
Alaska	333,952	Educational and Health Services (18%)
		Trade, Transportation and Utilities ^b (14%)
		Local Government (12%)
North Slope Borough	14,247	Natural Resources and Mining (59%)
		Local Government (14%)
		Professional and Business Services (10%)
Yukon-Koyukuk Census Area	2,519	Local Government (55%)
		Trade, Transportation and Utilities ^b (10%)
		Other Services (5%)
Fairbanks North Star Borough	39,323	Trade, Transportation and Utilities ^b (19%)
		State Government (14%)
		Educational and Health Services (13%)
Denali Borough	1,920	Leisure and Hospitality ^a (51%)
		Federal Government (12%)
		Trade, Transportation and Utilities ^b (10%)
Matanuska-Susitna Borough	20,808	Trade, Transportation and Utilities ^b (19%)
		Educational and Health Services (19%)
		Local Government (15%)
Kenai Peninsula Borough	20,017	Trade, Transportation and Utilities ^b (19%)

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TABLE 5.3.2-1		
Average Annual Employment and Top Three Industries in the Study Area, 2012		
Area	Average Annual Employment	Top Industries by Employment (% of total)
		Educational and Health Services (16%)
		Local Government (16%)
Municipality of Anchorage	155,544	Trade, Transportation and Utilities ^b (20%)
		Educational and Health Services (15%)
		Professional and Business Services (12%)
Southeast Fairbanks Census Area	2,499	Federal Government (18%)
		Trade, Transportation and Utilities ^b (14%)
		Local Government (13%)
Valdez-Cordova Census Area	4,803	Trade, Transportation and Utilities ^b (23%)
		Local Government (18%)
		Leisure and Hospitality ^a (12%)
Other - City of Unalaska	3,845	Manufacturing (60%)
		Trade, Transportation and Utilities ^b (15%)
		Local Government (13%)
Source: U.S. Department of Labor (2014)		
Notes:		
^a Includes visitor-related travel occupations.		
^b Excludes visitor-related travel occupations.		

About 41 percent of the state's workforce live in Anchorage and another 13 percent in the adjoining Matanuska-Susitna Borough, home to a large number of Anchorage and North Slope commuters. Nearly one-third of Matanuska-Susitna Borough residents work in Anchorage and another eight percent work in the North Slope Borough, reflecting the Matanuska-Susitna Borough's role as home to a large share of the oil industry workforce (Fried, 2010). Other areas in which employment is concentrated include the Fairbanks North Star Borough, and Kenai Peninsula Borough, with much smaller employment totals in other boroughs and census areas.

The Denali Borough has the smallest share of the workforce within the AOI. Compared to other lightly populated rural regions of Alaska, the borough economy is one of the most stable and diverse in the state (Fried, 2009). The borough's leisure and hospitality sector, which is tied to Denali National Park, is the largest source of employment. Local government and natural resources jobs, the latter driven by the Usibelli Coal Mine in Healy, are the next largest employers. Federal employment is also high because of Denali National Park and Clear Air Force Station (Fried, 2012).

The Yukon-Koyukuk Census Area is a very sparsely populated region where jobs are scarce and many communities lie off the road system. Like many rural parts of Alaska, government is a top employer there, reflecting the continued importance of the public sector in Alaska. It is especially common for the government to account for a large share of jobs in small communities, as even the smallest villages tend to have public services, law enforcement, and a school. One reason for this large percentage is

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geography; some services are likely to be duplicated because a government employee cannot efficiently travel long distances to serve residents of other communities. Another reason is that private sector jobs are limited in the Yukon-Koyukuk Census Area (Shanks and Rasmussen, 2010).

In 2012, there were approximately 14,000 oil and gas industry jobs in the state (Fried, 2013). Moreover, there are many Alaska residents who are not currently employed in the industry but have the occupational skills to be employed in the construction and operation of the Mainline and other Project components. ADOLWD (2009) identified 113 occupations critical to the planning, construction, and operation of a gas pipeline. Many of these occupations would also be required for construction of other Project-related facilities. The job categories range from office and field engineering to safety, camps, and catering. The largest concentration of workers with gas pipeline-related occupational skills is in highly populated Southcentral Alaska; however, as shown in Figure 5.3.2-1, many areas of the state have workers with gas pipeline-related occupational skills, including areas outside the AOI.

In recent years, recognition that construction of a major natural gas pipeline would require the development of a skilled workforce led to increased efforts to address workforce development in Alaska. In 2008, the Alaska Department of Labor and Workforce Development developed the “Alaska Gasline Inducement Act Training Strategic Plan,” the overall purpose of which is to enhance Alaska’s existing training programs so that Alaskans are afforded the opportunity to upgrade skills and acquire new ones in preparation for replacing an aging workforce and for possible jobs in the oil and gas industry. The U.S. Department of Labor made a federal grant award for \$7.5 million to the Alaska Department of Labor and Workforce Development to spend on skill training programs for jobs in pipeline construction and maintenance (Office of the Governor 2007). Training opportunities have been provided to 1,646 individuals (Alaska Department of Labor and Workforce Development, 2014b). In addition, there have been significant Alaska legislative investments that connect with pipeline-related occupations, including funding for construction academies in various communities in the state and a comprehensive pipeline worker training facility in Fairbanks (Alaska Department of Revenue and Department of Natural Resources, 2009).

Per Capita Income and Unemployment Rate

With the exception of the North Slope Borough, Denali Borough, and Municipality of Anchorage, the average personal per capita income in the boroughs or census areas in the AOI was less than Alaska’s per capita income (Table 5.3.2-2). The borough with the highest per capita income was the North Slope Borough, at \$41,712. The high wages of oil and gas industry jobs in Prudhoe Bay skew the per capita income of the borough upward. The traditional communities in the North Slope Borough had a per capita income lower than the state average. The difference between the per capita income for Prudhoe Bay and other census tracts in the North Slope Borough is readily apparent in Figure 5.3.2-2.

As for the other two areas exceeding the state’s average per capita income, in the Denali Borough two of the four PACs have high-paying, year-round employers: Anderson has the Clear U.S. Air Force Station, and Healy has Usibelli Coal Mine, Inc. The relatively high per capita income in the Municipality of Anchorage reflects the more robust economic conditions generated by the state’s most urbanized and populated area.

Per capita income was lowest in the Yukon-Koyukuk Census Area. Data for this area most closely reflect trends in personal income in small, rural Alaskan villages, which often lack significant job opportunities.

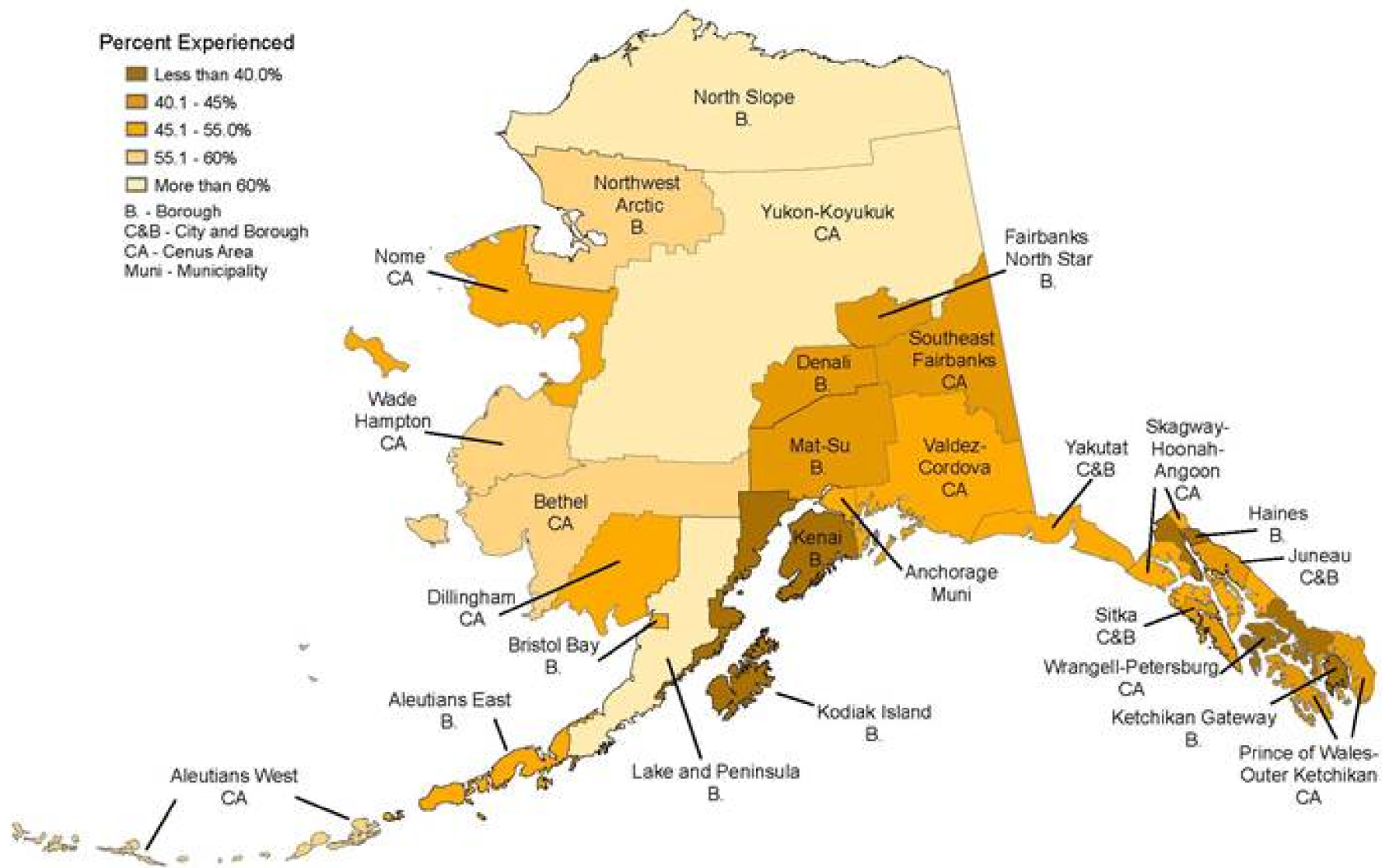
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Moreover, the higher cost of living in rural areas of Alaska exacerbates the negative economic effect of lower incomes, although many rural Alaskans continue to secure subsistence harvests (e.g., hunt and fish), which substantially reduce their food costs.

TABLE 5.3.2-2 Average Per Capita Income and Unemployment Rate in the Study Area ^a						
Area	Average Per Capita Income		Average Unemployment Rate		Percent Not in Labor Force	
	\$	Margin of Error (±)	%	Margin of Error (±)	%	Margin of Error (±)
Alaska	32,537	1	7	—	28.5	0.3
North Slope Borough	41,712	10	5.3	—	23.4	2.4
Anaktuvuk Pass	18,936	18.8	23.7	12.4	34.5	10.5
Atkasuk	18,265	18.2	16.3	8.7	48.8	10.9
Barrow	29,605	16.3	14.7	4.4	25.4	5.6
Kaktovik	21,361	19.7	5.6	5.9	52	10.1
Nuiqsut	26,735	15.7	20.5	8.2	32.4	8.4
Point Hope	23,963	11	16	4.9	30.6	6.6
Point Lay	21,192	17	8.8	5.9	39.8	10.6
Prudhoe Bay	91,932	19	4.8	3	3.5	3.4
Wainwright	19,838	17.5	26.7	8.9	32.8	6
Yukon-Koyukuk Census Area	20,109	4.3	14.7	—	37.8	1.9
Coldfoot	—	—	—	—	—	—
Livengood	29,863	41.8	5.9	22.5	60.5	33.5
Nenana	27,815	14.6	23.9	7.4	29.9	6.6
Wiseman	—	—	—	—	—	—
Fairbanks North Star Borough	32,344	3.4	6.2	—	26.7	1.2
Fairbanks	27,646	4.5	8.7	1.8	29.5	1.5
Denali Borough	38,621	12.9	10.2	—	24.5	6.2
Anderson	46,734	19	2.8	—	25.2	10.1
Cantwell	29,066	22.2	11.5	11.4	41.6	13.1
Healy	41,427	23.6	2.5	2.7	28	10.6
McKinley Park	27,765	37.6	1	2.1	6.6	10.3
Matanuska-Susitna Borough	29,465	2.2	8	—	34.5	0.9
Big Lake	28,981	14.1	12.2	3.9	38.8	6.1
Houston	25,876	12.8	17.5	5.8	36.2	5.4
Knik-Fairview	29,818	6.6	12.1	2.6	29.7	3
Palmer	25,382	7.5	11.9	3.3	33.4	3.4
Point MacKenzie	18,415	34.8	24.1	28.5	86.7	12.1
Talkeetna	21,567	23.1	7	9.1	41.7	12.9
Trapper Creek	18,777	36.2	11	17.7	51.6	16.3
Wasilla	29,085	8.5	11.9	3	34.9	3.6
Willow	28,820	14.5	9.2	5.4	41.3	6.7
Kenai Peninsula Borough	30,789	3.2	8.4	—	36.6	1.1
Cooper Landing	41,390	26.8	4.5	7.1	11.3	14.1
Kenai	31,318	9	9.7	2.7	29.6	3.7

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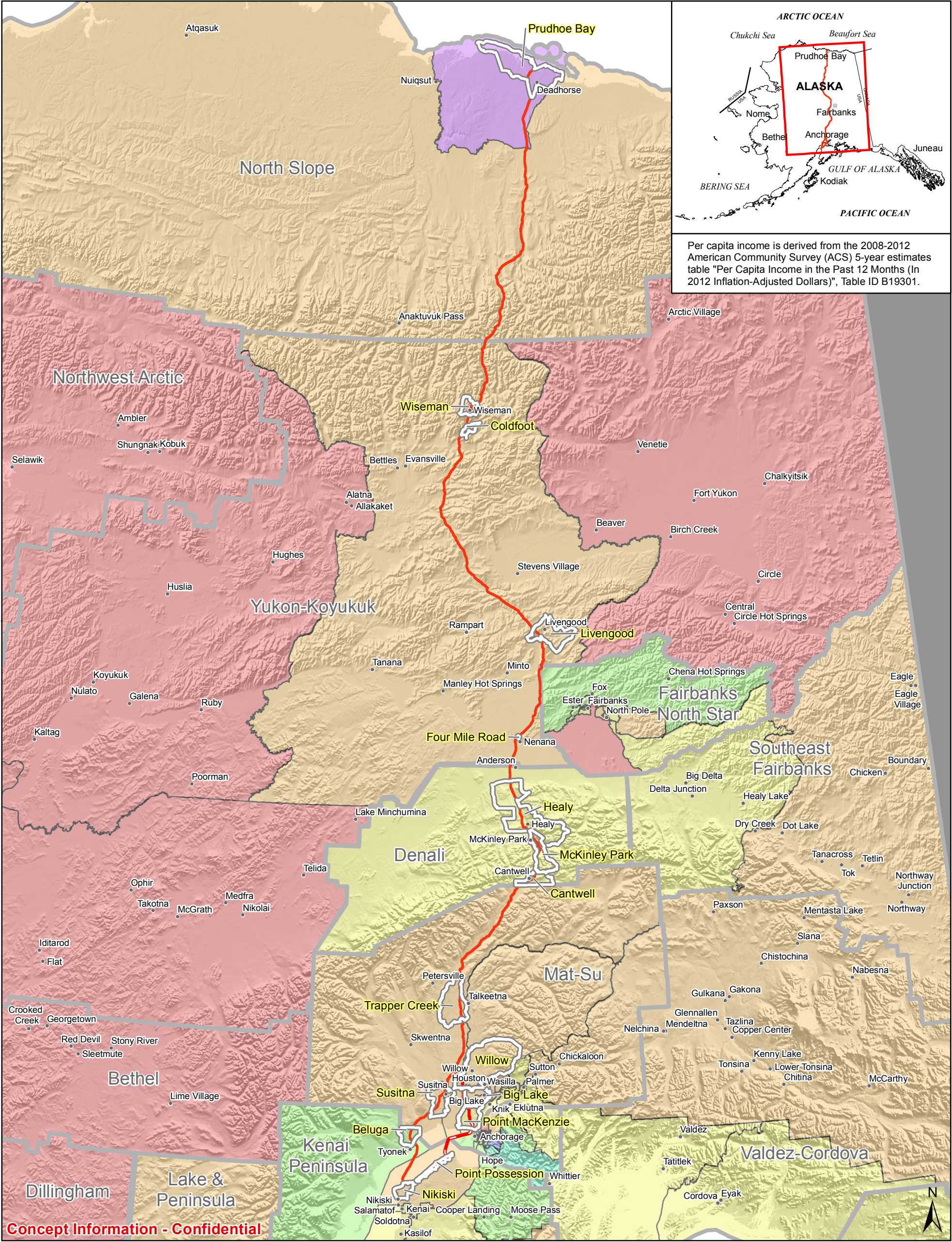
TABLE 5.3.2-2 Average Per Capita Income and Unemployment Rate in the Study Area ^a						
Area	Average Per Capita Income		Average Unemployment Rate		Percent Not in Labor Force	
	\$	Margin of Error (±)	%	Margin of Error (±)	%	Margin of Error (±)
Moose Pass	38,343	32.8	12.4	12.1	4	6.3
Nikiski	30,774	9	6.9	2.9	37.5	4.6
Salamatof	23,382	16.3	8.9	6.1	62.4	6.1
Seward	27,332	23.2	8.7	6.4	45	9.1
Soldotna	30,553	25.2	9.5	4.7	42.7	5.2
Sterling	35,725	12.7	6.6	3.4	37.1	4.5
Tyonek	21,730	31.4	16.1	11.4	39.2	11.9
Municipality of Anchorage	36,145	2.1	5.4	—	25.4	0.6
Eklutna ANVSA	—	—	6.9	22.7	49.1	41.3
Southeast Fairbanks Census Area	28,833	7.7	11.2	—	33.5	3.5
Big Delta	20,708	23	16.6	8.2	40.7	13.3
Delta Junction	37,282	14.3	6.1	5.3	30.9	9.4
Valdez-Cordova Census Area	—	—	8.9	—	30.7	3.4
Copper Center	24,269	25	15.4	10.1	34	12
Copper Center ANVSA	—	—	13.8	8.1	33.2	8.9
Gakona	31,038	27	10.8	12	39.3	17
Gakona ANVSA	—	—	15.3	18.6	39	23.3
Glennallen	22,545	28.4	3.4	5.3	35.4	18.3
Gulkana	20,351	33.6	1.5	3.7	30.5	14.7
Gulkana ANVSA	—	—	1.7	4.1	38.5	16.2
Paxson	38,100	31	0	87.2	55.6	14.3
Tazlina	33,618	13	5.3	4.7	43.3	11.4
Tazlina ANVSA	—	—	5.2	4.6	43.8	11.2
Tonsina	37,824	25.3	0	36.2	14.8	29.1
Valdez	36,609	16.5	4.8	3.3	24.2	5.9
Whittier	31,624	18.8	8.7	7	30.7	13.2
Other - City of Unalaska	31,578	7.3	2.6	1.6	8.4	1.9
<p>Source: U.S. Census Bureau (2014c); Alaska Department of Labor and Workforce Development (2014c)</p> <p>Notes:</p> <p>An “—” indicates that the measure is unavailable.</p> <p>^a State, borough and census area unemployment data are for 2012. Per capita income data, labor force participation data, and community-level unemployment data are an average for 2008–2012.</p>						



ALASKA LNG

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<div> <div>DESIGN</div> <div>TCS</div> </div>		RESIDENCE OF ALASKA WORKERS WHO HAVE EXPERIENCE IN GAS PIPELINE OCCUPATIONS			
<div> <div>CHECK</div> <div></div> </div>	<div> <div>DESIGN</div> <div>TCS</div> </div>	PROJECTION	AK ALB	DATUM	NAD83
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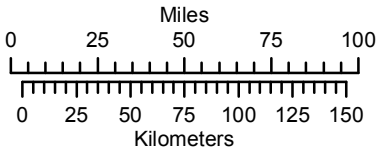


Concept Information - Confidential

LEGEND

2010 Census Tracts with Per Capita Income

\$10 k - \$20 k	\$50 k - \$60 k	2010 Census Designated Places Along Pipeline Study Corridor
\$20 k - \$30 k	\$60 k - \$70 k	Alaska Borough and Census Area Boundaries
\$30 k - \$40 k	\$70 k - \$80 k	Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)
\$40 k - \$50 k	\$100 k +	Alternate Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)



ALASKA LNG			DRAWN ICS		AVERAGE PER CAPITA INCOME IN THE AREA OF INTEREST, AVERAGE 2008-2012				
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			DESIGN TCS		AK 4	NAD83	URS ALASKA	5.3.2-2	
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I:\26221163 SCLNG Studies\10 - Geospatial\10.06 - MXD\2014 Reporting\NE\Figure 5.3.2-2 Per Capita Income.mxd

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A marked variation in unemployment rates existed within the AOI in 2012. The Municipality of Anchorage, Fairbanks North Star Borough, and North Slope Borough had unemployment rates lower than the state average of seven percent. Among communities in the North Slope Borough, the unemployment rate was low in Prudhoe Bay, but the rate was far higher than the state average in most of the traditional communities.

Of the boroughs and census areas within the AOI, Anchorage had the lowest unemployment rate in 2012. Anchorage is Alaska's largest and most economically diverse city. Unalaska also has a very low unemployment rate because of the availability of fishing-related jobs. Unalaska's Port of Dutch Harbor routinely lands more fish by volume than any other port in the U.S.

The remaining boroughs and census areas had unemployment rates higher than state averages, ranging from 8 percent in the Matanuska-Susitna Borough to 14.7 percent in the Yukon-Koyukuk Census Area. Unemployment is especially high in small, rural Alaska villages, particularly during the winter when there is little alternative market-based activity (U.S. Department of the Interior, 2002). Limited job opportunities account for the low labor force participation rate in the Yukon-Koyukuk Census Area, while the high retiree population accounts for the low rate in the Kenai Peninsula Borough.

It is likely that unemployment data underestimate the number of people who would like to work, particularly in more rural communities, because the unemployment rate includes only persons who are looking for work. In many rural Alaska communities, the number of employment opportunities is limited, and because much of rural Alaska is off the road system, commuting to a job in another town or city is often impractical. Consequently, some people may cease to actively search for work (U.S. Department of the Interior, 2002; Robinson, 2009).

The Denali Borough had the largest seasonal difference in the unemployment rate in 2013, ranging from 24.9 percent in January to 3.4 percent in July and August. The bedrock of the borough's economy is the leisure and hospitality sector, which is closely tied to Denali National Park. While the park is open during the winter months, the large majority of park visitors arrive between late May and early September. Consequently, it is during these months that the hotels, rafting operations, sightseeing tours and other visitor-related activities in the area are most active.

5.3.2.2 Economic Drivers

This section describes the most important economic sectors and largest economic drivers in the AOI and State of Alaska. The primary focus is on those economic sectors that will potentially be directly affected by Project construction and operations. These sectors include the oil and gas, construction, transportation, and travel sectors. In addition, other major economic drivers in the state are briefly discussed.

Oil and Gas Industry

The oil and gas sector, whose focus lies on Alaska's hydrocarbon-rich North Slope, is the largest private economic driver in the state. The industry includes those companies engaged in oil and gas extraction and support activities for oil and gas operations. In 2013, Alaska's crude oil production ranked fourth in the U.S. (U.S. Energy Information Administration, 2014a). Oil production (not including support activities) directly accounts for a quarter of total gross state product. An 8 percent decrease in mining activity in 2013, reflecting a drop in oil production from the North Slope, contributed to the decline of Alaska's total

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gross domestic product (GDP) by 2.5 percent in 2013, the largest decline of any state (U.S. Energy Information Administration, 2014a). The state's per capita real GDP, however, remained the highest in the nation (U.S. Department of Commerce, 2014a).

Although only 4 percent of all jobs in Alaska are directly involved in the production, transportation, and refining of oil (Fried, 2013), the oil industry supports one-third of all jobs in the state (Goldsmith, 2010a). In addition to the direct jobs created by the oil and natural gas industry, thousands of other jobs in Alaska are supported by the industry, including security, catering, accommodations, facilities management, transportation companies, engineering services, and logistics (Fried, 2013). Approximately one-third of all personal income in the state can be traced to the oil industry (either due to work in oil production-related activities, spending of the state's oil revenues, or the Permanent Fund dividend) (Goldsmith, 2010a).

Direct employment in the oil and gas sector is concentrated in the North Slope Borough, which became the center of Alaska's oil boom in 1977 with the completion of TAPS. Prudhoe Bay is the hub for most oil and gas related activity in the borough. After years of stagnation due to declining oil production and low oil prices, employment levels at Prudhoe Bay began to grow in the mid-2000s and rose to a record-high over the next 10 years. Increased oil prices, which spurred repair and maintenance of production wells, construction of new connecting pipelines, initiation of heavy oil drilling operations, and continued development of a number of satellite fields, are primarily responsible for the past decade's employment growth (Fried, 2013). Currently, over half the state's oil and gas industry workforce is employed in the North Slope Borough, and nearly half of the borough's employment is in the industry, which is the highest concentration in the state (Fried, 2013). All of the top 10 private sector employers in the borough are companies involved in the oil and gas industry (Alaska Oil and Gas Association, 2014a).

Of the 8,400 direct jobs in the oil and gas industry in the North Slope Borough in 2012 (Table 5.3.2-3), only about 69 jobs were held by North Slope residents (Fried, 2013). The vast majority of workers are drawn from other areas of the state and nation. Most North Slope oil and gas industry employees follow a fly-in/fly-out commute work arrangement whereby they spend a certain number of days working on site and living in group quarters, after which they return home for a specified rest period. Moreover, the oil and gas industry infrastructure and work sites on the North Slope are hundreds of miles away from most of the borough's resident population. As a result of these factors, North Slope oil and gas workers have minimal participation in the local economy (Shell Offshore Inc., 2011). In contrast, the boroughs in which most North Slope oil and gas industry workers reside, including the Municipality of Anchorage, Matanuska-Susitna Borough, and Kenai Peninsula Borough, enjoy substantial economic benefit from the payroll dollars spent locally by workers (Fried, 2013). Over the past decade, the percentage of workers in Alaska's oil and gas industry who are state residents has fluctuated between 69 and 74 percent (Fried, 2013).

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TABLE 5.3.2-3 Oil and Gas Industry Employment, Income, and Output in the Study Area, 2012			
Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed (2005) Dollars)
State of Alaska	14.5	1,943.60	4,964.80
North Slope Borough	8.4	1,152.80	2,168.20
Yukon-Koyukuk Census Area	0	0.2	0
Fairbanks North Star Borough	0.8	70	0
Denali Borough	0	0	0
Matanuska Susitna Borough	0	0.6	0
Kenai Peninsula Borough	1.2	125.7	310.8
Municipality of Anchorage	3.5	572.1	2,484.50
Southeast Fairbanks Census Area	0	0	0
Valdez-Cordova Census Area	0.1	1.2	1.3
Source: Regional Economic Models, Inc. (2013)			

Although few North Slope Borough residents are directly employed by the oil and gas industry, many are indirectly employed by the industry. Local government is the borough's second-largest sector after the oil and gas industry and is the top employer of North Slope residents. In 2012, borough residents comprised 78 percent of local government employment (Alaska Department of Labor and Workforce Development, 2014d). Property tax payments by North Slope oil producers are the main source of capital and operating revenue for the borough.

The Kenai Peninsula Borough also historically has been home to many of Alaska's oil and gas industry jobs as a result of the discovery of large oil and gas deposits in Cook Inlet basin during the late 1950s and early 1960s. The heart of the Cook Inlet oil and gas industry is the industrial area of Nikiski. Numerous oil and gas service companies support the Nikiski area infrastructure with a diverse workforce, including onshore and offshore services, and Port Nikiski docks provide access to offshore drilling platforms. A significant portion of Cook Inlet's crude oil, together with oil from the North Slope and out-of-state sources, is transported to Tesoro Alaska's oil refinery in Nikiski, which produces jet fuel, gasoline, and other products (Shanks and Rasmussen, 2010). A 69-mile pipeline transports petroleum products from the refinery to the Port of Anchorage and Ted Stevens Anchorage International Airport. In addition, for decades Cook Inlet natural gas has supplied all of Southcentral Alaska's residential, commercial, and industrial demand including manufacture and export of large quantities of LNG (Thomas et al., 2004).

ConocoPhillips Alaska's Kenai LNG Plant located in Nikiski began operating in 1969, and for more than 40 years was the only LNG export plant of domestic production in the U.S. (ConocoPhillips Alaska, 2013). In 2013, the plant's export license expired. However, due to a change in market conditions, including additional gas supplies in the Cook Inlet Basin, and with the encouragement of various stakeholders, ConocoPhillips Alaska pursued a new license which was granted in 2014 and allows export of the equivalent of 40 billion cubic feet (bcf) of LNG over a two-year period (ConocoPhillips Alaska, 2014). The Kenai LNG Plant employs approximately 50 people directly and 128 people indirectly, generating an estimated \$13.4 million in personal income (DOE, 2014).

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A fertilizer plant that relied on Cook Inlet gas feedstock for its production processes was among the largest private employers in the Kenai Peninsula Borough until its closure in 2007 as a result of the high price and low supply of gas. The closure led to job losses, but the oil and gas industry continues to be an important source of employment in the borough. Further, average earnings in the industry remain among the highest of any industry in the borough (Shanks and Rasmussen, 2010).

While most of the direct jobs created by the oil and gas industry are concentrated in the North Slope and Kenai Peninsula Boroughs, a substantial number of these jobs also are located in Anchorage and Fairbanks (Table 5.3.2-3). Anchorage, which accounted for a quarter of the state's oil and gas industry jobs in 2012, often serves as the headquarters or service center for many companies involved in the industry. For example, BP Exploration Alaska and ConocoPhillips were among Anchorage's top 15 employers in 2010 (Alaska Oil and Gas Association, 2014b). Fairbanks' direct oil and gas employment is relatively small, but the city is a major logistical and supply center for the North Slope (Fried, 2013). In addition, until one refinery was converted into an oil shipping and storage terminal in 2014, the city had two refineries processing North Slope crude oil (Cole, 2014).

Although Alaska's oil production has trended downward for the past two decades, industry employment has been on the rise as a result of the increased labor needed to retrieve less accessible oil, as well as the drive to extract more oil when oil prices are high. As Alaska's facilities age, additional labor is required for repair and maintenance as well as extraction (Schultz, 2013). Between 2002 and 2012, the oil and gas industry's payroll grew by 106 percent, considerably more than the 56 percent growth for all industries (Fried, 2013).

Construction Industry

The construction industry is one of Alaska's largest, employing 6.4 percent of workers in the state (Alaska Department of Labor and Workforce Development, 2014d). Construction employment fell each year between 2006 and 2011, but in 2012 it changed course and grew substantially. Alaska's construction employment started falling one year before the industry declined nationwide and three years before Alaska lost jobs across all industries. The industry likely started to soften before the national recession started in 2007 due to the end of a housing boom in the Matanuska-Susitna Borough. Public construction had been the bright spot in an otherwise dimming industry, and is likely largely responsible for the industry's turnaround in 2012. Alaska's fiscal year 2012 capital budget was \$2.8 billion, which buoyed the construction industry across the state (Schultz, 2013). Average quarterly wages in construction are higher than the state average (Alaska Department of Labor and Workforce Development, 2014d).

Table 5.3.2-4 presents an overview of the construction industry in the study area in terms of employment, income, and output (sales). In 2012, construction employment statewide was approximately 25,000, with about 42 percent of those jobs occurring in Anchorage. While the number of construction workers rose in 2012, the industry remains below its 2005 peak of 31,100 workers (Alaska Department of Labor and Workforce Development, 2014d). In addition, the growth was not evenly spread between residents and non-residents; non-residents grew to 22 percent of all construction workers in 2012, up from 20 percent in 2011 (Alaska Department of Labor and Workforce Development, 2014d).

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TABLE 5.3.2-4 Construction Industry Employment, Income, and Output in the Study Area, 2012			
Borough or Census Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed [2005] Dollars)
State of Alaska	24.9	1,356.60	2,896.80
North Slope Borough	0.5	39.6	66.4
Yukon-Koyukuk Census Area	0.2	11.3	23.5
Fairbanks North Star Borough	3.7	256.4	464.7
Denali Borough	0	0.5	1.3
Matanuska Susitna Borough	3.4	129.6	298.9
Kenai Peninsula Borough	2.2	79.8	186.3
Municipality of Anchorage	10.6	801.7	1,406.30
Southeast Fairbanks Census Area	0.3	18.9	33.5
Valdez-Cordova Census Area	0.3	18.8	37.6
Source: Regional Economic Models, Inc. (2013)			

Transportation Industry

Alaska's transportation industry is also one of the state's larger employers. Transportation plays a much bigger role in Alaska's economy than it does in the rest of the nation because the vast distances and lack of highways makes it considerably more difficult to move people or goods in the state. Nationally, only three percent of all private wage and salary employment is tied to transportation, versus almost six percent in Alaska (Fried and Keith, 1999).

Alaska's transportation industry is also unusually diverse (Fried and Keith, 1999). It encompasses the air, water, rail, and truck transportation sectors. The air transportation sector accounts for around half of all transportation employment in Alaska versus less than one-third nationally (Fried and Keith, 1999). Table 5.3.2-5 presents an overview of the air transportation industry in the study area in terms of employment, income, and output (sales). As of 2012, more than 5,600 jobs existed in the industry statewide. Anchorage is the industry's center because it is the location of Ted Stevens Anchorage International Airport, the largest airport in the state and one of the busiest cargo airports in the world. It is estimated that 1 in 10 jobs in Anchorage is directly or indirectly related to the airport (McDowell Group, 2012). Non-residents made up about 22 percent of the worker total in air transportation in 2012 (Alaska Department of Labor and Workforce Development, 2014d).

TABLE 5.3.2-5 Air Transportation Industry Employment, Income, and Output in the Study Area, 2012			
Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed [2005] Dollars)
State of Alaska	5.7	398.9	1,387.70
North Slope Borough	0.1	4.8	15.8
Yukon-Koyukuk Census Area	0	0.8	4.6

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TABLE 5.3.2-5 Air Transportation Industry Employment, Income, and Output in the Study Area, 2012			
Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed [2005] Dollars)
Fairbanks North Star Borough	0.6	33.8	128.8
Denali Borough	0	0.3	0.9
Matanuska Susitna Borough	0.1	5.4	22.1
Kenai Peninsula Borough	0.2	9.3	35.2
Municipality of Anchorage	2.7	237.6	765.6
Southeast Fairbanks Census Area	0	2.1	5.8
Valdez-Cordova Census Area	0	2.5	9.1
Source: Regional Economic Models, Inc. (2013)			

In addition, no state in the continental U.S. depends on water transportation as much Alaska does (Fried and Keith, 1999). Water transportation may be one of the smaller transportation sectors in terms of employment, but it handles the greatest tonnage of freight coming into the state. The Port of Anchorage, which is an enterprise department under the Municipality of Anchorage, is the largest port in the state, handling 90 percent of all consumer goods sold in Southcentral Alaska and serving approximately 80 percent of the state's population (Fried and Keith, 1999). Table 5.3.2-6 presents an overview of the water transportation industry in the study area in terms of employment, income, and output (sales). In 2012, approximately 45 percent of the workers in the industry were non-residents (Alaska Department of Labor and Workforce Development, 2014d).

TABLE 5.3.2-6 Water Transportation Industry Employment, Income, and Output in the Study Area, 2012			
Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed (2005) Dollars)
State of Alaska	1.1	100.5	471.6
North Slope Borough	0	3.3	13.7
Yukon-Koyukuk Census Area	0	1.4	7.5
Fairbanks North Star Borough	0	0	0
Denali Borough	0	0	0
Matanuska Susitna Borough	0	0.4	2.5
Kenai Peninsula Borough	0.1	7.4	37
Municipality of Anchorage	0.3	21.9	104.9
Southeast Fairbanks Census Area	0	0	0
Valdez-Cordova Census Area	0.3	39.1	170.9
Source: Regional Economic Models, Inc. (2013)			

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In contrast to air and water transportation, trucking's share of the transportation industry in Alaska is considerably smaller than in the nation as a whole due to the absence of a network of interstate highways. Nevertheless, trucking businesses are major employers in the state, accounting for more than 4,000 jobs in 2012. Table 5.3.2-7 presents an overview of the truck transportation industry in the study area in terms of employment, income, and output (sales). The Port of Anchorage and Ted Stevens Anchorage International Airport, together with the state's highway system, make Anchorage the center of Alaska's truck transportation industry. Fairbanks serves as the Interior's transportation hub. Non-residents accounted for about 15 percent of the truck transportation workforce in 2012 (Alaska Department of Labor and Workforce Development, 2014d).

TABLE 5.3.2-7 Truck Transportation Industry Employment, Income, and Output in the Study Area, 2012			
Area	Employment (Thousands)	Compensation (Millions of Current Dollars)	Output (Millions of Fixed (2005) Dollars)
State of Alaska	4.1	226	679.4
North Slope Borough	0.1	9.8	24.6
Yukon-Koyukuk Census Area	0	0	0
Fairbanks North Star Borough	0.9	50.5	152.6
Denali Borough	0	0	0
Matanuska Susitna Borough	0.1	3.1	11.3
Kenai Peninsula Borough	0.2	8.6	27.4
Municipality of Anchorage	2.3	133.8	398.7
Southeast Fairbanks Census Area	0	0.4	1
Valdez-Cordova Census Area	0	0.7	2.2
Source: Regional Economic Models, Inc. (2013)			

The Alaska Railroad Corporation (ARRC), a public corporation, owns and operates the Alaska Railroad for the State of Alaska. The ARRC employs around 600 year-round workers (ARRC, 2013), but it plays an important role in moving people, materials, and equipment from Seward and Whittier in the south through Anchorage to Fairbanks in the north. Dock and handling yards are maintained by the ARRC at the ports of Anchorage, Seward, and Whittier for handling freight reaching Alaska by ship and barge (Fried and Keith, 1999). Customers can load their goods onto a railcar in the Lower 48 and it will be transferred to Alaska and communities along the rail lines via the contracted barge services that operate from Seattle and Prince Rupert, British Columbia.

Travel Industry

Since the 1990s, the travel industry, buoyed by tourism, has been one of the fastest growing contributors to the state's economy. Slightly more than half of visitors to Alaska arrive by cruise ship, while nearly half come by air and much smaller numbers come by highway or ferry. The number of visitors climbed from 39,000 in 1961 to 1,966,700—the largest annual visitor count in Alaska's history—for the 12-month period of May 2013 through April 2014 (Leask et al., 2001; McDowell Group, 2014b). During that same period, visitors spent an estimated \$1.82 billion in the state (this figure excludes the cost of transportation to and from the state, such as air tickets, cruise or cruise/tour packages, and ferry tickets) (McDowell

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Group, 2014a). Annual visitation volume is largely driven by the summer market, which represents 86 percent of full-year volume (McDowell Group, 2014b).

While total travel expenditures in Alaska are small compared to other western states, Alaska ranks high on the basis of per-capita visitor spending. These expenditures support employment, expand the payrolls, and generate profits for restaurants, hotels, sightseeing, and other businesses linked to the visitor industry (Goldsmith, 2010a). The visitor industry accounts for about nine percent of the state's employment (McDowell Group, 2014b).

Other Economic Drivers

The federal government is another major economic driver in Alaska. The federal government supports more jobs for Alaskans, both military and civilian, than any private industry (Goldsmith, 2008). About a third of the jobs and personal income in Alaska can be traced directly or indirectly to all types of federal spending (Goldsmith, 2010a). The federal government spent \$10.9 billion in Alaska in 2010 (Goldsmith, 2012), equivalent to about 22 percent of gross state product that year (U.S. Department of Commerce 2014b). Federal funds made up about 15 percent of the revenues in the Alaska state budget of FY2013 (Alaska Department of Administration, 2013).

The high level of federal spending is due to a large military presence, federal land ownership, health and other programs for Alaska Natives, and the continuing need to build basic infrastructure in much of Alaska (Goldsmith, 2008). The Department of Defense has a total of nine Air Force, Army, and Coast Guard installations. Nearly all of the 22,438 members of the U.S. military stationed in Alaska in 2012 were with the Army, Air Force, or Coast Guard.

Between 1995 and 2005, federal spending in Alaska increased by \$5 billion, or 118 percent. No other sector of the economy generated that kind of economic growth (Goldsmith, 2008). Until 1996, per capita federal spending in Alaska was approximately 38 percent above the national average; by 2008 it was 71 percent higher (Goldsmith, 2008). Federal spending supports not just the military and federal civilian agencies, but also many other industries such as construction and health care (Goldsmith, 2008; Fried 2012).

Alaska's seafood industry expanded in the 1970s and 1980s with the recovery of Alaska salmon runs, development of profitable new crab fisheries, and replacement of foreign boats with American boats and processors in the Bering Sea groundfish fisheries (Leask et al., 2001). As a result of development of the domestic groundfish fisheries, Dutch Harbor-Unalaska has been the leading U.S. fishing port in reported quantity of commercial fishery landings from 1997 to 2012, the most recent year data were available (NOAA Fisheries Service, 2012). Alaska seafood in 2011 accounted for roughly 10 percent of the total value of the U.S. seafood supply, including domestic production and imports (McDowell Group, 2013).

The seafood industry directly employed an estimated 63,100 people in Alaska in 2011, 27,230 of whom were Alaska residents. Roughly one in eight workers in Alaska earned at least part of their annual income directly from the seafood industry in 2011. These direct jobs produced \$4.6 billion worth of wholesale seafood and resulted in an estimated \$1.7 billion in labor income (McDowell Group 2013). Salmon fisheries create the largest total economic impact in Alaska, followed by federal groundfish/flatfish fisheries, and the halibut/sablefish fisheries. Salmon fisheries generate higher levels of secondary economic activity within Alaska compared to other fisheries due to higher rates of Alaska resident

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involvement, more shore-side processing, greater in-state purchases of goods and services in support of fishing operations, and the presence of salmon hatcheries.

Mining added few jobs until the 1990s, when mineral production—chiefly zinc—increased sharply as a result of relatively strong prices (Leask et al. 2001; Gilbertsen and Robinson, 2003). Alaska mineral production value increased from \$1 billion in 2003 to \$3.4 billion in 2012, due largely to higher prices rather than changes to production amounts (Fried and Robinson, 2008; Athey et al., 2013). As of 2012, the mining industry accounted for 4,366 jobs (Athey et al., 2013). The mining industry in Alaska (and elsewhere) has encountered large barriers to entry. Finding, developing, and producing the minerals and metals is time-consuming and expensive, and because mineral and metal prices are highly cyclical, companies must time their activities so that mines do not become active as mineral and metal prices decline.

5.3.2.3 Rural Alaska and the Alaska Native Population

This section provides an overview of economic conditions in rural Alaska, where the majority of the population is Alaska Native. In addition to discussing the general economy, poverty rate, and cost of living in the rural communities of the AOI, information is presented on the Alaska Native Claims Settlement Act (ANCSA) corporations in the AOI.

Distribution of Alaska Native Population

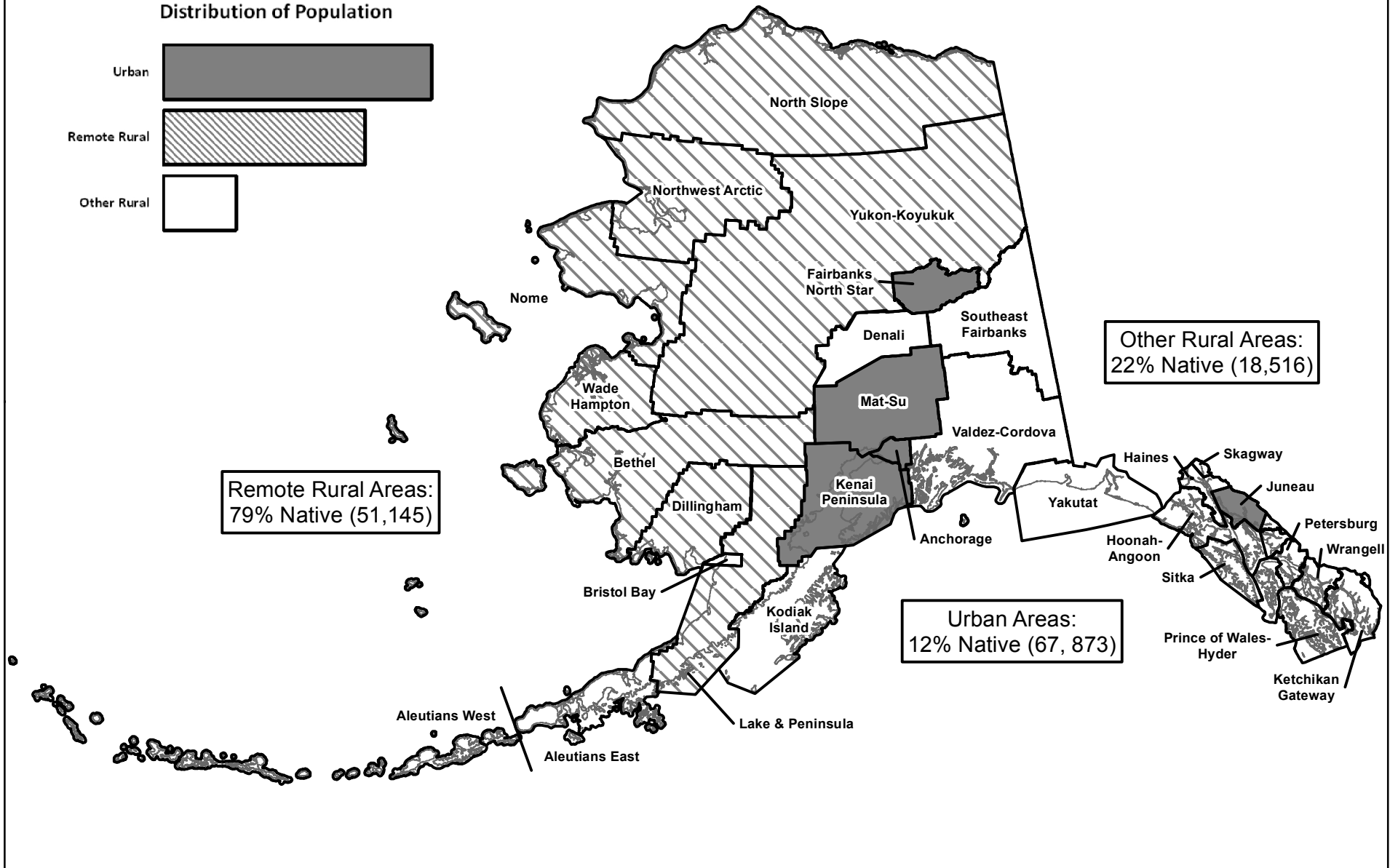
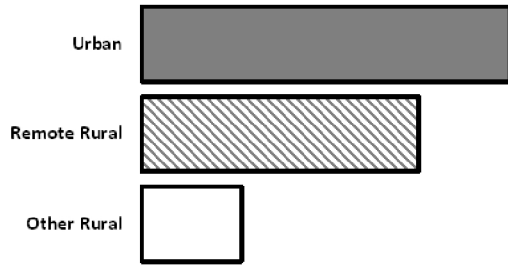
The Alaska Native population is the primary racial group in much of rural Alaska, accounting for about 79 percent of the population in remote rural areas of the state as defined by Goldsmith et al. (2004) (Figure 5.3.2-3). In comparison, only 12 percent of the population in the urban areas of the state are Alaska Natives or American Indian. However, about half of the Alaska Native and American Indian population (67,873) live in urban areas of the state.

Mixed Economies

Many of the small communities in the rural parts of the AOI have “mixed” economies in which households rely on both cash income and the harvest of subsistence resources. Subsistence is essential to residents’ diets because of the low availability of jobs and the high cost of food in grocery stores, especially in the smaller villages. Rural households use money in order to purchase fuel oil, electricity, and family goods like clothing and shelter. In addition, they also use cash to purchase equipment used in subsistence activities, such as guns and ammunition; fishing nets, boats, all-terrain vehicles (ATVs), and snow machines (and gas and oil for these); rain gear; and more. In other words, money is used to invest in the tools for subsistence hunting, fishing, and gathering (Alaska Department of Fish and Game, undated).

Cash-paying jobs tend to be few and unstable (temporary or seasonal) in rural Alaska, so cash incomes tend to be small and insecure (Alaska Department of Fish and Game, undated). Opportunities for year-round employment are primarily in local government and in small retail stores. Seasonal sources of income include construction, firefighting, commercial fishing, and fur trapping.

Distribution of Population



ALASKA LNG

NOTES:
Concept Information - Confidential. Produced by Alaska LNG team. The information used to create this product is based on the collected data on the date of issue; it is considered reliable only at the scale at which the data was created and the scale at which the map was published. This drawing is solely prepared for use by the contractual Alaska LNG team partners and the Alaska LNG team assumes no liability to any other party for any representations contained in these drawings. This map must be printed/viewed at full scale (100%) in order for the scale to remain correct.

DESIGN TCS		DISTRIBUTION OF ALASKA NATIVE OR AMERICAN INDIAN POPULATION, AVERAGE 2008-2012			
CHECK		PROJECTION	DATUM	CONTRACTOR NAME	MFP NUMBER
DESIGN TCS		AK ALB	NAD83	URS ALASKA	5.3.2-3
REVIEW		SCALE	DATE	PROJECT NUMBER	ORIG PAGE SIZE
		1:14,000,000	17 Dec 2014	26221301	8.5 X 11

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Transfer payments, including the Permanent Fund dividend, unemployment benefits, retirement benefits, and Medicaid payments, account for a much larger share of household income in rural areas of Alaska. The Permanent Fund dividend is particularly important because many rural households are cash poor due the scarcity of year-round jobs, and subsistence harvests can fluctuate dramatically from year to year. Under these circumstances, the income provided by the dividend is significant, not only because of its size but also its reliability (Goldsmith, 2010b).

Poverty Rate

Table 5.3.2-8 shows the poverty rate in the AOI and state as a whole using data from the U.S. Census Bureau. Following the Office of Management and Budget's Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family (and every individual in it) or unrelated individual is considered in poverty. The poverty thresholds for Alaska do not adjust for geographic differences in the cost-of-living. With a few exceptions, the poverty rate is higher in Alaska's rural areas than in more urbanized areas. Within the AOI, the poverty rate for the Yukon-Koyukuk Census Area, North Slope Borough, and Southeast Fairbanks Census Area in 2012 was higher than that of the state as a whole (Table 5.3.2-8). The state's most populous areas, including the Municipality of Anchorage, Fairbanks North Star Borough, Matanuska-Susitna Borough, and Kenai Peninsula Borough, tend to have less poverty (Shanks, 2012). In general, boroughs and census areas with high unemployment rates also have high poverty rates, the Yukon-Koyukuk Census Area being a case in point (Table 5.3.2-8). However, areas with large seasonal economies, such as the Denali Borough, have relatively low poverty rates and high unemployment rates because much of their income is earned during the summer and few jobs are available during the off-season (Shanks, 2012).

TABLE 5.3.2-8		
Average Poverty Rate in the Study Area ^a		
Area	Individuals Living in Poverty (%)	Margin of Error (±)
Alaska	10.8	0.5
North Slope Borough	12.6	3.7
Anaktuvuk Pass	7.3	4.9
Atkasuk	19.3	8.8
Barrow	17.7	7.4
Kaktovik	16.3	14.8
Nuiqsut	0.8	0.9
Point Hope	7.2	3.8
Point Lay	11	7
Prudhoe Bay	8.4	7.5
Wainwright	12.4	5.1
Yukon-Koyukuk Census Area	22.6	4
Coldfoot	—	—
Livengood	0	37.6
Nenana	19.9	8.8
Wiseman	—	—
Fairbanks North Star Borough	9.2	1.8

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TABLE 5.3.2-8 Average Poverty Rate in the Study Area ^a		
Area	Individuals Living in Poverty (%)	Margin of Error (±)
Fairbanks	12.1	2.3
Denali Borough	6.2	1.3
Anderson	1.9	3.9
Cantwell	6.7	8.2
Healy	7.9	10.6
McKinley Park	22	16.6
Matanuska-Susitna Borough	10.1	1.5
Big Lake	13	4.8
Houston	15.8	5.4
Knik-Fairview	8.4	2.6
Palmer	11.5	2.5
Point MacKenzie	0	12
Talkeetna	16.5	9.7
Trapper Creek	22.3	19.3
Wasilla	13.1	4.3
Willow	10.9	5.4
Kenai Peninsula Borough	10.8	1.9
Cooper Landing	3.3	6.3
Kenai	11	3.5
Moose Pass	0	6.3
Nikiski	10	4.2
Salamatof	12.1	8.9
Seward	6.4	5.4
Soldotna	6.1	2.2
Sterling	7.4	3.7
Tyonek	30.2	14.2
Municipality of Anchorage	9	1
Eklutna ANVSA	—	—
Southeast Fairbanks Census Area	12.8	2.8
Big Delta	7.5	6.1
Delta Junction	7.1	4.5
Valdez-Cordova Census Area	9.5	2.1
Copper Center	17.9	9.2
Copper Center ANVSA	—	—
Gakona	4.5	5.1
Gakona ANVSA	—	—
Glennallen	0	4.3
Gulkana	1.4	2.7
Gulkana ANVSA	—	—
Paxson	0	58.2
Tazlina	11.7	7.5
Tazlina ANVSA	—	—

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TABLE 5.3.2-8 Average Poverty Rate in the Study Area ^a		
Area	Individuals Living in Poverty (%)	Margin of Error (±)
Tonsina	0	26.6
Valdez	5.5	3.2
Whittier	14	8.5
Other - City of Unalaska	9.9	2.8
Source: U.S. Census Bureau (2014c); U.S. Census Bureau (2014b) Notes: An “—” indicates that the measure is unavailable. ^a State, borough, and census area data are for 2012. Community-level data are an average for 2008–2012.		

The highest poverty rates often are found in areas with larger Alaska Native populations. Within the AOI, the Yukon-Koyukuk Census Area and North Slope Borough are home to proportionally larger Alaska Native populations and have relatively high poverty rates. Statewide, the average percentage of Alaska Natives living in poverty during the 2008–2012 period was higher than any other racial or ethnic group and more than twice that of whites (Table 5.3.2-9).

TABLE 5.3.2-9 Poverty Rate in Alaska by Race/Ethnicity, Average 2008-2012		
Race/Ethnicity	Individuals Living in Poverty (%)	Margin of Error (±)
One race	9.3	0.4
White	6.7	0.4
Black or African American	10.8	2.1
American Indian and Alaska Native	20.7	1
Asian	10.8	2.1
Native Hawaiian and Other Pacific Islander	15.3	5.7
Some other race	6.9	3.1
Two or more races	12.7	1.5
Hispanic or Latino origin (of any race)	10.1	1.6
White alone, not Hispanic or Latino	6.6	0.4
Source: U.S. Census Bureau (2014c)		

Cost of Living

Living in the remote parts of the state off the road system is expensive because of the high cost of transporting goods (and services). For example, Fried (2014) describes the findings of the Department of Defense’s OCONUS (outside the contiguous United States) cost-of-living index, which compares costs in Alaska communities to the average prices for military bases in the continental U.S. (CONUS = 100), and reported that the cost of living in Delta Junction was six index points (five percent) higher than in Anchorage in 2014, while the cost of living in Wainwright and Barrow was around 28 index points (22 percent) higher (Table 5.3.2-10). A major reason for the higher cost of living in smaller and more remote

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communities is the significantly higher energy prices in these communities in comparison to more urban areas. Additional information regarding the disparate energy costs of living in rural and urban Alaska is presented in Section 5.3.3.

The higher living costs in rural areas of the state are exacerbated by a lack of year-round employment opportunities and lower money incomes (Leask et al., 2001). Several of rural Alaska's predominant industries, particularly seafood harvesting and processing, tourism, construction, and timber, are highly seasonal and result in total employment for the summer exceeding that in the winter by at least 16 percent, or 50,000 (not counting the self-employed who are not fish harvesters) (Goldsmith, 2010a). On the other hand, many rural Alaskans continue to secure subsistence harvests (e.g., hunt and fish), which substantially reduces their costs for food (Leask et al., 2001).

TABLE 5.3.2-10 Cost of Living Index in the Area of Interest, 2014 ^a	
Area	Index
North Slope Borough	
Barrow	158
Wainwright	158
Fairbanks North Star Borough	
Fairbanks	134
Matanuska-Susitna Borough	
Wasilla	128
Kenai Peninsula Borough	
Kenai (includes Soldotna)	140
Seward	130
Municipality of Anchorage	130
Southeast Fairbanks Census Area	
Delta Junction	136
Valdez-Cordova Census Area	
Valdez	136
Other - City of Unalaska	138
Source: Fried (2014) Notes: ^a The OCONUS data do not cover all communities in the AOI.	

Alaska Native Claims Settlement Act Corporations

Regional and village corporations created under ANCSA play a major role in Alaska's economy and an even more important role in their individual regions by creating jobs, as well as earning profits. The 12 regional corporations provide a variety of monetary benefits to their Alaska Native shareholders and others, including dividends, elder benefits, scholarships, memorial benefits, shareholders' equity, and charitable donations.

The most broadly distributed benefits are shareholder dividends, which are drawn from a portion of each corporation's profits. In 2010, there were approximately 111,000 regional corporation shareholders, of

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which about 25 percent reside outside Alaska (Government Accounting Office, 2012). Roughly 40 percent of the individuals in the state who reported they are American Indian/Alaska Native alone or in combination with another race do not receive regional corporation dividends because they are not shareholders (initial enrollment in a corporation was based on a blood quantum requirement) (Government Accounting Office, 2012; U.S. Census Bureau, 2014a). Moreover, the total dividends per share paid by each of the regional corporations varies considerably. Nevertheless, Alaska Natives who are shareholders report that dividends are often the most important benefit they receive from the corporations—the payments provide a critical source of income to help defray living expenses, such as high heating costs during the winter (Government Accounting Office, 2012).

Collectively, the regional corporations' revenues in 2010 reached almost \$8.2 billion. As some of Alaska's largest businesses, they have extensive operations and multiple subsidiaries operating in Alaska, the lower 48 states, and several other countries. A 2012 study by the Government Accounting Office (2012) reported that the corporations collectively operate more than 330 wholly owned subsidiaries, ranging from fewer than 10 at one regional corporation to more than 50 subsidiaries at another. Total employees ranged from more than 500 to almost 11,000.

Non-monetary benefits offered by the regional corporations—often in partnership with village corporations, tribal organizations, and non-profit organizations within the region—include employment opportunities; cultural preservation; land management; economic development; and advocacy on behalf of Alaska Natives and their communities (Government Accounting Office 2012). A number of non-profit organizations providing health and social services are major employers in rural communities.

The regional and village for-profit ANCSA corporations located in the AOI are listed in Table 5.3.2-11; see Appendix A for discussion of AOI definition. For nearly two decades Arctic Slope Regional Corporation (ASRC) has been the largest Alaskan-owned and operated company, based on revenues. ASRC is owned by and represents the business interests of the Iñupiat people of the North Slope, the source of Alaska's oil and gas wealth. As of 2012, ASRC had 11,090 shareholders, 15 percent of whom lived outside Alaska. Dividends and distributions that year were nearly \$74 million (Government Accounting Office, 2012).

In 2012, ASRC's gross revenues of \$2.6 billion were the highest in the company's 40 year history (Arctic Slope Regional Corporation, 2013). ASRC also owns a portion of North Slope subsurface mineral rights under the Alpine oil field and is paid production royalties from the field. Under terms of the ANCSA, 70 percent of these royalties are shared with other ANCSA regional corporations (Bradner, 2005).

ASRC's five major business segments are petroleum refining and marketing, energy support services, construction, government services, and resource development. ASRC Energy Services, a wholly owned subsidiary of ASRC, performs an array of oilfield engineering, operations, maintenance, construction, fabrication, regulatory and permitting, and other services for some of the world's largest oil and gas companies. The company has emerged as one of Alaska's largest oilfield service providers and one of Alaska's largest private-sector employers (Fried, 2011; Arctic Slope Regional Corporation, 2014). Petro Star, Inc., another subsidiary of ASRC, is the only Alaskan-owned refining and fuel marketing operation in the state (Arctic Slope Regional Corporation, 2014).

Village ANCSA corporations in the North Slope Borough also are active in the oil and gas sector (Linxwiler, 2007). For example, the oilfield service company UMIAQ, LLC, a division of the Ukeagvik

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Iñupiat Corporation, the village corporation for Barrow, Kuukpik Corporation, and the village corporation for Nuiqsut, provides camp services and catering to several producers operating on the North Slope (Bradner 2005).

TABLE 5.3.2-11		
ANCSA Corporations in the Area of Interest ^a		
Area	Regional ANCSA corporation	Village ANCSA corporation
North Slope Borough		
Anaktuvuk Pass	Arctic Slope Regional Corporation	Nunamiut Corporation, Incorporated
Atkasuk	Arctic Slope Regional Corporation	Atkasuk Corporation
Barrow	Arctic Slope Regional Corporation	Ukpeagvik Inupiat Corporation
Kaktovik	Arctic Slope Regional Corporation	Kaktovik Inupiat Corporation
Nuiqsut	Arctic Slope Regional Corporation	Kuukpik Corporation
Point Hope	Arctic Slope Regional Corporation	Tikigaq Corporation
Point Lay	Arctic Slope Regional Corporation	Cully Corporation Incorporated
Prudhoe Bay	(none)	(none)
Wainwright	Arctic Slope Regional Corporation	Olgoonik Corporation
Yukon-Koyukuk Census Area		
Coldfoot	(none)	(none)
Livengood	(none)	(none)
Nenana	Doyon, Limited	Toghotthele Corporation
Wiseman	(none)	(none)
Fairbanks North Star Borough		
Fairbanks	(none)	(none)
Denali Borough		
Anderson	(none)	(none)
Cantwell	Ahtna, Inc	Yedatene Na Corporation
Healy	(none)	(none)
McKinley Park	(none)	(none)
Matanuska-Susitna Borough		
Big Lake	(none)	(none)
Houston	(none)	(none)
Knik-Fairview	Cook Inlet Region, Inc.	Knikatnu, Inc.
Palmer	(none)	(none)
Point MacKenzie	(none)	(none)
Talkeetna	(none)	(none)
Trapper Creek	(none)	(none)
Wasilla	(none)	(none)
Willow	(none)	(none)
Kenai Peninsula Borough		
Cooper Landing	(none)	(none)
Kenai	(none)	(none)
Moose Pass	(none)	(none)
Nikiski	(none)	(none)
Salamatof	Cook Inlet Region, Inc.	Salamatof Native Association, Inc.
Seward	(none)	(none)

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TABLE 5.3.2-11 ANCSA Corporations in the Area of Interest ^a		
Area	Regional ANCSA corporation	Village ANCSA corporation
Soldotna	(none)	(none)
Sterling	(none)	(none)
Tyonek	Cook Inlet Region, Inc.	Tyonek Native Corporation
Municipality of Anchorage		
Eklutna ANVSA	Cook Inlet Region, Inc.	Eklutna, Inc.
Southeast Fairbanks Census Area		
Big Delta	(none)	(none)
Delta Junction	(none)	(none)
Valdez-Cordova Census Area		
Copper Center	Ahtna, Inc.	Kluti-Kaa Corporation
Copper Center ANVSA	Ahtna, Inc.	Kluti-Kaa Corporation
Gakona	Ahtna, Inc.	(none)
Gakona ANVSA	Ahtna, Inc.	(none)
Glennallen	Ahtna, Inc.	(none)
Gulkana	Ahtna, Inc.	(none)
Gulkana ANVSA	Ahtna, Inc.	(none)
Paxson	Ahtna, Inc.	(none)
Tazlina	Ahtna, Inc.	Tazlina Inc.
Tazlina ANVSA	Ahtna, Inc.	Tazlina Inc.
Tonsina	Ahtna, Inc.	(none)
Valdez	(none)	(none)
Whittier	(none)	(none)
Other - City of Unalaska	The Aleut Corporation	Ounalashka Corporation
^a See Appendix A for explanation of AOI definition Source: Alaska Department of Commerce, Community and Economic Development (2014b)		

Doyon, Ltd., whose lands cover the Yukon-Koyukuk Census Area, also provides support for oil and gas operations in the North Slope Borough. Doyon's other lines of business include government contracting, tourism, and natural resource development. With a land entitlement of 12.5 million acres, Doyon is the largest private landowner in Alaska and one of the largest private landowners in North America (Doyon 2014). As of 2012, Doyon had 18,536 shareholders, 25 percent of whom lived outside Alaska. Gross revenues in 2010 were \$280 million. Dividends and distributions that year exceeded \$7.2 million (Government Accounting Office, 2012).

Ahtna, Inc., with headquarters in Glenallen and lands spanning Alaska's Southcentral Interior, is involved in facilities management, construction services, environmental services, professional services and staffing, pipeline maintenance, range support and training, land management and protection services, and land and natural resource development. As of 2012, Ahtna had 1,751 shareholders, 18 percent of whom lived outside Alaska. Gross revenues in 2010 were \$243 million. Dividends and distributions that year were \$880,000 (Government Accounting Office, 2012).

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The geographic boundary of Cook Inlet Region Inc. (CIRI) closely approximates the traditional homeland of the Dena'ina Athabascans and includes the Municipality of Anchorage (CIRI, 2014). CIRI's business operations include real estate, oilfield and construction services, environmental remediation, government contracting, tourism and hospitality properties and attractions, telecommunications, and resource and energy development. As of 2012, CIRI had 7,986 shareholders, 39 percent of whom lived outside Alaska. Gross revenues in 2010 were \$188 million. Dividends and distributions that year totalled more than \$22 million (Government Accounting Office, 2012).

The primary business areas of the Aleut Corporation are real estate, government contracting, oil, gas and securities investments, and sales of sand, gravel, minerals, and rock aggregates from its subsurface rights in the region. The Aleut Corporation's land selections are located on the Alaska Peninsula and the Aleutian, Shumagin, and Pribilof Islands (Aleut Corporation, 2014). As of 2012, the Aleut Corporation had 3,750 shareholders, 41 percent of whom lived outside Alaska. Gross revenues in 2010 were \$143 million. Dividends and distributions that year totalled \$7.6 million (Government Accounting Office, 2012).

ANCSA corporations outside the study area could also be affected by the construction and operations of the Project. For example, Bristol Bay Native Corporation, NANA, Calista Corporation, and Chugach Alaska Corporation also have subsidiaries active in the oil and gas industry (Linxwiler, 2007).

5.3.3 Housing

A housing unit is defined by the U.S. Census Bureau as a house, apartment, group of rooms, or single room occupied or intended for occupancy as separate living quarters. There were a total of 246,154 housing units within the AOI in 2010, out of a total of 306,967 in the state of Alaska (Table 5.3.3-1). Prudhoe Bay is a large work camp for the oil industry. All residents are employees of oil production and support companies, and living quarters are provided by the companies to the workforce (Alaska Department of Commerce, Community and Economic Development, 2014a).

Of the total housing units in the AOI, 92 percent were occupied, compared to the state average occupancy rate of 84.1 percent. The Municipality of Anchorage and Fairbanks North Star Borough, two of the most urbanized areas in the AOI, had the highest occupancy rates and both exceeded the state average. The lowest occupancy rates were in the Yukon-Koyukuk Census Area and the Denali Borough.

Median monthly rent in the boroughs and census areas within the AOI was less than that in the state as a whole, with the exception of the Municipality of Anchorage, Fairbanks North Star Borough, and City of Unalaska. The Denali Borough had the lowest median monthly rent.

TABLE 5.3.3-1 General Housing Characteristics in the Study Area					
Area	Total Units (2010)	Occupied Units (%) (2010)	Median Value of Owner Occupied Units (\$) (Avg. 2008–2012)		Median Gross Rent (\$) (Avg. 2008– 2012)
			\$	Margin of Error %	
Alaska	306,967	84.1	237,900	0.8	1,065
North Slope Borough	2,500	81.2	151,100	17.8	969

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TABLE 5.3.3-1

General Housing Characteristics in the Study Area

Area	Total Units (2010)	Occupied Units (%) (2010)	Median Value of Owner Occupied Units (\$) (Avg. 2008–2012)		Median Gross Rent (\$) (Avg. 2008– 2012)
			\$	Margin of Error %	
Anaktuvuk Pass	118	83.9	158,300	26.8	800
Atkasuk	68	94.1	119,600	26.1	736
Barrow	1,554	82.4	183,000	6.4	1,120
Kaktovik	87	82.8	115,200	35.5	— ¹
Nuiqsut	136	83.8	99,300	8.8	936
Point Hope	221	84.2	95,400	5.6	820
Point Lay	70	85.7	102,500	16.8	900
Prudhoe Bay	—	—	—	—	—
Wainwright	179	82.1	110,700	31.5	840
Yukon-Koyukuk Census Area	4,038	54.9	106,500	5.1	678
Coldfoot	11	54.5	—	—	—
Livengood	34	20.6	110,000	71.5	—
Nenana	215	79.5	82,100	26.9	665
Wiseman	25	20	—	—	—
Fairbanks North Star Borough	41,783	87.2	213,500	2.3	1,157
Fairbanks	13,056	88.3	194,600	3.4	1,170
Denali Borough	1,771	45.5	201,900	16.6	782
Anderson	145	62.1	114,600	13.2	858
Cantwell	200	52	146,500	13.2	719
Healy	711	61	241,500	12.7	1,400
McKinley Park	422	25.8	323,300	59	733
Matanuska-Susitna Borough	41,329	77	217,700	1.8	1,003
Big Lake	2,780	49.4	205,200	12.2	1,050
Houston	973	75.1	177,000	11.1	869
Knik-Fairview	5,535	47.4	207,100	5.7	1,314
Palmer	2,281	92.6	184,600	4.2	885
Point MacKenzie	112	43.6	172,500	78	—
Talkeetna	744	60.3	126,500	26.7	678
Trapper Creek	499	45.1	119,700	124	731
Wasilla	3,277	90.4	218,000	5.2	955
Willow	1,912	46.7	182,700	23.3	1,021
Kenai Peninsula Borough	30,578	72.5	202,300	3.6	852
Cooper Landing	161	40.8	306,500	38.9	—
Kenai	3,166	88.7	177,600	7.1	837
Moose Pass	137	67.9	234,700	47	—
Nikiski	1,689	84.5	165,200	10.4	875
Salamatof	246	82	197,700	15.6	1,042
Seward	1,124	82.6	186,800	18.9	751
Soldotna	1,720	87.4	202,800	10.6	893

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TABLE 5.3.3-1 General Housing Characteristics in the Study Area					
Area	Total Units (2010)	Occupied Units (%) (2010)	Median Value of Owner Occupied Units (\$) (Avg. 2008–2012)		Median Gross Rent (\$) (Avg. 2008– 2012)
			\$	Margin of Error %	
Sterling	2,254	67.3	242,300	10.8	950
Tyonek	144	48.6	80,500	58.8	615
Municipality of Anchorage	113,032	95	277,100	1.2	1,104
Eklutna ANVSA	29	79.3	168,800	28	938
Southeast Fairbanks Census Area	3,915	65.6	178,600	9.7	1,141
Big Delta	305	67.5	170,800	8.2	—
Delta Junction	517	72.9	183,500	18.4	1,046
Valdez-Cordova Census Area	6,102	65	175,100	5.9	870
Copper Center	199	61.8	169,100	18.4	763
Copper Center ANVSA	265	63	167,700	7.5	780
Gakona	131	65.6	196,200	34.2	796
Gakona ANVSA	74	64.9	189,900	13	933
Glennallen	336	60.4	170,800	35.8	475
Gulkana	60	60	137,500	136.8	575
Gulkana ANVSA	82	53.7	205,000	52.7	771
Paxson	90	51.1	—	—	—
Tazlina	54	64.8	175,000	25.3	706
Tazlina ANVSA	179	12.3	177,500	23.6	706
Tonsina	205	37.6	215,900	53.5	—
Valdez	165	67.3	172,100	11.6	1,111
Whittier	280	40.7	57,000	30.3	675
Other - City of Unalaska	1,106	83.8	309,500	10.5	1,330
Source: U.S. Census Bureau (2014a); U.S. Census Bureau (2014c) An “—” indicates that the measure is unavailable.					

As shown in Table 5.3.3-2, of the vacant housing units located in the boroughs and census areas of the AOI, the majority are for seasonal, recreational, or occasional use. Temporary housing also is available in the form of daily, weekly, and monthly rentals in motels, hotels, campgrounds, and recreational vehicle parks. These visitor accommodations are located throughout the region, but are most highly concentrated in the Municipality of Anchorage and Matanuska-Susitna and Denali Boroughs, all of which are on the road system. The availability of these accommodations varies and is likely to decline during the summer tourist season, during a local event, or during periods of high housing demand by other industries (e.g., mining). Approximately nine out of ten visitors to the state come during the summer travel season (McDowell Group 2014a).

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TABLE 5.3.3-2 Vacant Housing Characteristics in the Study Area							
Area	Number of Vacant Units	Units for Sale (%)	Units for Rent (%)	Vacant for Seasonal, Recreational, or Occasional Use (%)	Other Vacant (%)	Hotels/ Motels	RV Parks/ Campgr ounds
	(2010)					2014	
Alaska	48,909	5.9	13.8	57	19.9		
North Slope Borough	471	0.6	24.6	33.3	37.6		
Anaktuvuk Pass	19	0	5.3	0	94.7		
Atkasuk	4	0	0	0	100		
Barrow	274	0.7	29.6	30.3	37.2	6	
Kaktovik	15	0	0	6.7	86.7	2	
Nuiqsut	22	4.5	40.9	9.1	45.5		
Point Hope	35	0	42.9	14.3	40	1	
Point Lay	10	0	40	0	20	1	
Prudhoe Bay	0	—	—	—	—	3	
Wainwright	32	0	18.8	21.9	40.6	1	
Yukon-Koyukuk Census Area	1,821	0.8	5.9	65.6	26.4		
Coldfoot	5	0	0	100	0	1	1
Livengood	27	0	0	66.7	33.3		
Nenana	44	2.3	11.4	31.8	54.5	4	1
Wiseman	20	0	5	95	0	3	
Fairbanks North Star Borough	5,342	9.5	28.1	31.4	27.8	86	
Fairbanks	1,522	15.2	51.8	12	18	29	8
Denali Borough	965	2.4	5.2	77.1	14	58	
Anderson	55	9.1	12.7	41.8	36.4		
Cantwell	96	6.3	13.5	64.6	15.6	3	1
Healy	277	3.2	8.3	54.5	30	11	2
McKinley Park	313	0	1	96.2	2.2	2	9
Matanuska-Susitna Borough	9,505	5.6	6.2	71.8	14.5	196	
Big Lake	1,408	3	1.7	88.1	6.7	2	3
Houston	242	9.9	9.5	55.4	23.6		2
Knik-Fairview	495	20.2	12.9	31.5	30.5		
Palmer	168	15.5	42.3	8.9	25	24	6
Point MacKenzie	145	0.7	0.7	89.7	9		
Talkeetna	295	1.4	5.8	74.2	15.6	38	3
Trapper Creek	274	4	1.1	84.7	9.1	5	3
Wasilla	315	17.1	38.4	14.3	26	31	1
Willow	1,019	2.7	1.6	89.8	4.5	12	7
Kenai Peninsula Borough	8,417	4.8	7.8	72.3	13	604	
Cooper Landing	234	2.6	1.7	88.5	6.4	9	5
Kenai	357	11.2	33.1	29.1	20.4	13	2
Moose Pass	44	6.8	9.1	63.6	20.5	6	2
Nikiski	309	6.5	11.3	41.7	37.5	3	1

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TABLE 5.3.3-2 Vacant Housing Characteristics in the Study Area							
Area	Number of Vacant Units	Units for Sale (%)	Units for Rent (%)	Vacant for Seasonal, Recreational, or Occasional Use (%)	Other Vacant (%)	Hotels/ Motels	RV Parks/ Campgrounds
	(2010)					2014	
Salamatof	54	14.8	7.4	46.3	22.2		
Seward	196	5.6	15.8	54.6	23.5	70	9
Soldotna	248	10.9	31.9	39.5	12.9	26	8
Sterling	1,093	3.5	6	78.5	11.1	13	6
Tyonek	74	0	2.7	66.2	29.7	1	
Municipality of Anchorage	5,700	14.9	30	26.3	22.7	250	7
Eklutna ANVSA	6	33.3	16.7	0	50		1
Southeast Fairbanks Census Area	1,348	3.1	14.8	53.7	23		
Big Delta	99	3	10.1	81.8	2		1
Delta Junction	140	2.1	46.4	23.6	6.4	10	8
Valdez-Cordova Census Area	2,136	2.4	11.5	62.8	20.8		
Copper Center	76	0	6.6	32.9	60.5	11	2
Copper Center ANVSA	98	2	5.1	40.8	48		
Gakona	45	0	6.7	46.7	37.8	6	3
Gakona ANVSA	26	0	3.8	53.8	30.8		
Glennallen	133	3.8	18	48.9	27.8	14	7
Gulkana	24	0	4.2	20.8	75	1	
Gulkana ANVSA	38	0	7.9	21.1	68.4		
Paxson	157	0	0	99.4	0.6	1	1
Tazlina	54	7.4	9.3	46.3	37	1	
Tazlina ANVSA	58	6.9	10.3	44.8	37.9		
Tonsina	40	0	12.5	52.5	15	1	
Valdez	190	6.8	25.3	26.3	37.4	24	6
Whittier	166	3.6	30.1	62.7	1.8	3	2
Other - City of Unalaska	179	3.4	18.4	19.6	38.5	2	
Source: U.S. Census Bureau (2014a) Notes: An “—” indicates that the measure is unavailable.							

There are a number of regional housing authorities serving the AOI as shown in Table 5.3.3-3. These housing authorities were originally formed to improve housing for Alaska Natives, but they currently serve all residents of their regions. The boundaries of the housing authorities are based on ANCSA regional corporation boundaries; consequently, Cantwell, which is located in the Denali Borough, is served by the Copper River Basin Regional Housing Authority (Ahtna, Inc.), while the remainder of the borough communities are served by the Interior Regional Housing Authority. A similar situation exists in Valdez, which is served by the North Pacific Rim Housing Authority (Chenega Corporation), while the rest of the Valdez-Cordova Census area is served by the Copper River Basin Regional Housing Authority

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(Ahtna, Inc.). The Tagiugmiullu Nunamiullu Housing Authority (Arctic Slope Regional Corporation) only serves the eight traditional communities on the North Slope and does not provide housing services at Prudhoe Bay.

TABLE 5.3.3-3 Regional Housing Authorities in the Area of Interest	
Area	Housing Authority
North Slope Borough	Tagiugmiullu Nunamiullu Housing Authority
Yukon-Koyukuk Census Area	Interior Regional Housing Authority
Fairbanks North Star Borough	Interior Regional Housing Authority
Denali Borough	Interior Regional Housing Authority
Cantwell	Copper River Basin Regional Housing Authority
Matanuska-Susitna Borough	Cook Inlet Housing Authority
Kenai Peninsula Borough	Cook Inlet Housing Authority
Municipality of Anchorage	Cook Inlet Housing Authority
Southeast Fairbanks Census Area	Interior Regional Housing Authority
Valdez-Cordova Census Area	Copper River Basin Regional Housing Authority
City of Valdez	North Pacific Rim Housing Authority
City of Unalaska	Aleutian Housing Authority
Source: Association of Alaska Housing Authorities (2014)	

5.3.4 Infrastructure and Services

This section discusses the existing public infrastructure and services within the AOI. A wide range of public services and facilities are offered across the AOI, with higher concentrations in the larger cities such as Anchorage and Fairbanks. Where services are not available at the local level, they are available from the borough or state. These services include law enforcement agencies, fire departments, hospitals and other medical facilities, schools, solid waste disposal, sewer and water, and other utilities. A Health Impact Assessment is being prepared for the Project that also will address medical and public safety among other health issues. This assessment will be summarized in, and provided as an attachment to a subsequent draft of this Resource Report.

The provision of public services and infrastructure across Alaska is expensive, particularly in rural areas. For example, the costs to construct public buildings—including schools, health clinics and hospitals—in remote areas are approximately twice as much per square foot as in Anchorage (Foster and Goldsmith 2008). The higher cost per square foot for rural buildings is due to a combination of higher input costs, especially freight costs (barge and air); limited supply of specialty labor (mechanical, electrical); challenging foundation conditions—including areas with abundant permafrost; weather delays; remote logistics; and the high cost of fuel. Moreover, the harsh winter climate of Alaska shortens the useful life of roads and other public buildings.

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5.3.4.1 Schools

Table 5.3.4-1 identifies the number of schools in communities within the AOI, as well as the grade levels and student enrollment at those schools. Anchorage was the largest school district in the AOI as of 2013, with 96 schools from pre-kindergarten through 12th grade and 39,616 students enrolled. The North Slope Borough, Yukon-Koyukuk Census Area and Denali Borough had the smallest student populations in the AOI.

Alaska schools vary greatly in size; high schools in Anchorage may serve more than 2,000 students; schools in urbanized or semi-urbanized areas of the Fairbanks North Star, Kenai Peninsula, and Matanuska-Susitna Boroughs may serve hundreds; and some schools in rural areas of Alaska have 20 or fewer students at a variety of grade levels (Alaska Teacher Placement 2014). The State of Alaska does not provide state funds for schools with fewer than 10 students.

The State of Alaska provides parents the option of home-schooling their children. Under state law, children schooled at home by their parents or guardians are exempt from compulsory attendance. Parents are not required to register with the state or their local school district, and no testing or other requirements are placed on home-schools not funded with public dollars. The Alaska Department of Education and Early Development oversees the regulation of correspondence schools available to home-school families. As of 2014, this department's website listed 33 correspondence schools, of which 14 are available to students from all over the state and 19 serve students in individual school districts (Alaska Department of Education and Early Development 2014b).

Table 5.3.4-2 presents the revenue per average daily membership (ADM), an indication of the cost per student, and funding sources in school districts within PACs. The average revenue per ADM in Alaska is higher than in any other state, reflecting the costs of maintaining educational services among widely geographically dispersed communities (U.S. Department of the Interior 2002). As shown in Table 5.3.4-2, the revenue per ADM in 2013 was highest in the North Slope Borough School District (where more funding comes from local government than in any other region) and lowest in the Anchorage School District. State law establishes a formula by which a guaranteed level of funding, known as "basic need," is determined for each of Alaska's school districts. This formula is weighted in favor of small, isolated sites and takes into consideration the total number of students enrolled in the entire district, the number of students in each school within the district, regional cost differentials ("district cost factors"), special needs funding, intensive services funding, and enrollment in correspondence programs. The components of public school funding are state aid, required local contribution, federal Title VIII impact aid, special revenue, and other sources. Federal impact aid provides funds to school districts for children with parents living and/or working on federal property, "in lieu of local tax revenues." Municipalities with taxing power are required to provide their coterminous school districts a local contribution equivalent to a \$2.65 million tax levy on the full and true value of the taxable real and personal property in the district, not to exceed 45 percent of the district's basic need for the preceding fiscal year (Alaska Department of Education and Early Development 2013).

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TABLE 5.3.4-1

Characteristics of School Districts in the Area of Interest, 2013

Area	Number of Schools						Enrollment	Student Capacity	District Pupil to Teacher Ratio
	All grades	Elementary	Secondary	High	Other	Total			
North Slope Borough									
North Slope Borough School District	7	1	1	2		11	2,008		10.7
Yukon-Koyukuk Census Area									
Yukon-Koyukuk School District ^b	9				1	10	1,526		27.6
Fairbanks North Star Borough									
Fairbanks North Star Borough School District ^c	2	17	4	4	8	35	14,126		17.5
Denali Borough									
Denali Borough School District	4					4	875		33.8
Nenana City School District	2					2	974		43
Matanuska-Susitna Borough									
Matanuska-Susitna Borough School District ^d	6	20	5	8	6	45	17,843		19.5
Kenai Peninsula Borough									
Kenai Peninsula Borough School District ^{ia}	12	14	4	6	7	43	9,077		14.5
Municipality of Anchorage									
Anchorage School District ^e	5	60	10	10	11	96	48,213		16.4
Southeast Fairbanks Census Area									
Alaska Gateway School District ^f	7				1	8	425		12.5
Delta-Greely School District ^g	2	1		2	1	6	851		18.6
Valdez-Cordova Census Area									
Chugach School District	4					4	312		22.4
Copper River School District ^h	3	1			1	5	451		15
Cordova City School District ⁱ	1	1			1	3	329		14.5
Valdez City School District		1	1	1		3	614		12.7
Other - City of Unalaska									
Unalaska City School District ^j		1			1	2	409		12.7

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TABLE 5.3.4-1

Characteristics of School Districts in the Area of Interest, 2013

Area	Number of Schools						Enrollment	Student Capacity	District Pupil to Teacher Ratio
	All grades	Elementary	Secondary	High	Other	Total			
<div>Source: Alaska Department of Education and Early Development (2014a); Alaska Department of Commerce, Community and Economic Development (2014b)</div> <div>Notes:</div> <div><div>^a There are three K-8 schools, three 7-12 schools, and one 9 grade school in the Kenai Peninsula Borough School District.</div><div>^b Ella B. Verneti School in the Yukon-Koyukuk School District include is a P-10 school.</div><div>^c There are three 7-12 schools, four K-8 schools, and one 5-12 school in the Fairbanks North Star School District.</div><div>^d There are four K-8 schools, one 6-12 school, and one 11-12 school in the Mat-Su Borough School District.</div><div>^e There are five K-8 grade, two 6-12 grade, and four 7-12 grade schools in the Anchorage School District.</div><div>^f Tanacross School in the Alaska Gateway School District is a K-8 school</div><div>^g Fort Greely School in the Delta-Greely School District is a 4-8 grade school.</div><div>^h There is one 7-12 school in the Copper River School District.</div><div>ⁱ There is one 7-12 school in the Cordova City School District.</div><div>^j Unalaska Jr. /Sr. High serves grades 7-12 in the Unalaska City School District.</div></div>									

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TABLE 5.3.4-2 Average Annual Cost per Student and Funding Sources for School Districts in the Area of Interest, 2013		
School District by Area	Revenue Per Average Daily Membership	Share of Funding by Source
North Slope Borough		
North Slope Borough School District	\$43,203	Local Government (49%), State Government (33%), Federal Government (8%), Other (2%), and Special Revenue (8%)
Yukon-Koyukuk Census Area		
Yukon Koyukuk School District	\$15,810	Local Government (0%), State Government (66%), Federal Government (7%), Other (6%), and Special Revenue (21%)
Fairbanks North Star Borough		
Fairbanks North Star Borough School District	\$16,694	Local Government (19%), State Government (67%), Federal Government (6%), Other (0%), and Special Revenue (7%)
Denali Borough		
Denali Borough School District	\$11,757	Local Government (22%), State Government (74%), Federal Government (0%), Other (1%), and Special Revenue (3%)
Nenana City School District	\$9,788	Local Government (1%), State Government (81%), Federal Government (0%), Other (1%), and Special Revenue (16%)
Matanuska-Susitna Borough		
Matanuska-Susitna Borough School District	\$14,590	Local Government (19%), State Government (73%), Federal Government (0%), Other (1%), and Special Revenue (6%)
Kenai Peninsula Borough		
Kenai Peninsula Borough School District	\$17,163	Local Government (28%), State Government (66%), Federal Government (0%), Other (1%), and Special Revenue (5%)
Municipality of Anchorage		
Anchorage School District	\$14,851	Local Government (27%), State Government (62%), Federal Government (3%), Other (0%), and Special Revenue (7%)
Southeast Fairbanks Census Area		
Alaska Gateway School District	\$29,141	Local Government (0%), State Government (82%), Federal Government (4%), Other (4%), and Special Revenue (10%)
Delta/Greely School District	\$16,306	Local Government (0%), State Government (86%), Federal Government (4%), Other (2%), and Special Revenue (8%)
Valdez-Cordova Census Area		
Chugach School District	\$25,170	Local Government (0%), State Government (45%), Federal Government (4%), Other (3%), and Special Revenue (48%)
Copper River School District	\$18,505	Local Government (0%), State Government (88%), Federal Government (5%), Other (1%), and Special Revenue (6%)
Cordova City School District	\$21,127	Local Government (26%), State Government (67%), Federal Government (0%), Other (1%), and Special Revenue (5%)
Valdez City School District	\$24,214	Local Government (53%), State Government (41%), Federal Government (0%), Other (1%), and Special Revenue (5%)
Other - Unalaska		
Unalaska School District	\$22,337	Local Government (30%), State Government (62%), Federal Government (0%), Other (1%), and Special Revenue (6%)
Source: Alaska Department of Education and Early Development (2014c)		

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5.3.4.2 Health Care

There are 10 major hospitals in the AOI—four in Anchorage, two in Fairbanks, and one each in Palmer, Barrow, Soldotna, and Seward (Table 5.3.4-3). The largest is Providence Alaska Medical Center in Anchorage, with 340 acute care beds as of 2014. The smallest hospital is Barrow’s Samuel Simmonds Memorial Hospital, with 14 acute care beds. All Alaska hospitals use some telemedicine applications to compensate for the cost and transportation obstacles facing patients who live in communities without hospitals (Alaska State Hospital and Nursing Home Association 2014). Health clinics or federally qualified health centers offering primary care are located in the majority of other communities in the AOI. Trauma cases and serious illness cases that occur in these communities must be sent to hospitals. Transport in emergency situations usually is by air (i.e., airplane or helicopter). Communities with hospitals that provide air medical services include Anchorage, Fairbanks, Seward, Soldotna, Palmer, and Barrow. Most communities in the AOI provide emergency medical services, often through local volunteer fire departments. A number of regional and community organizations administer health and social service programs for Alaska Natives.

TABLE 5.3.4-3					
Medical Services in the Area of Interest					
Area	Hospitals	Health Clinics and Federally Qualified Health Centers	Emergency Medical Services		
			Local Service Available	Level (see notes)	Access (see notes)
North Slope Borough					
Barrow	Samuel Simmonds Memorial Hospital	Barrow PHN	Barrow Volunteer Fire Department; North Slope Borough Fire Department/ Search and Rescue	3	c, sp, h
Prudhoe Bay	No	Private	Greater Prudhoe Bay Fire Department	2-Isolated	lh, c, ap
Wainwright	No	Wainwright Health Clinic	Wainwright Volunteer Fire Department	1-Isolated	c, a
Atqasuk	No	Atqasuk Clinic	Atqasuk Volunteer Fire Department	1-Isolated	r, a
Nuiqsut	No	Nuiqsut Clinic	Nuiqsut Volunteer Fire Department	1-Isolated	r, a
Kaktovik	No	Kaktovik Clinic	Kaktovik Volunteer Fire Department	1-Isolated	c, a
Point Lay	No	Point Lay Clinic	Kali Volunteer Fire Department	1-Isolated	c, a
Point Hope	No	Point Hope Health Clinic	Point Hope Volunteer Fire Department	1-Isolated	c, a
Anaktuvuk Pass	No	Anaktuvuk Pass Clinic	Anaktuvuk Pass Volunteer Fire Department	1-Isolated	r, ap
Yukon-Koyukuk Census Area					
Wiseman	No	Wiseman Health Clinic	No	1-Isolated	lh, a, r, s
Coldfoot	No	No	Coldfoot Volunteer Fire/EMS Department	1-Isolated	hw, a
Livengood	No	No	No	1-Isolated	hw, a
Nenana	No	Nenana Clinic	Nenana Volunteer Fire/EMS Department	2-Highway	hw, r, ap
Fairbanks North Star Borough					

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TABLE 5.3.4-3					
Medical Services in the Area of Interest					
Area	Hospitals	Health Clinics and Federally Qualified Health Centers	Emergency Medical Services		
			Local Service Available	Level (see notes)	Access (see notes)
Fairbanks	Fairbanks Memorial Hospital; Bassett Army Community Hospital	Interior Community Health Center; Chief Andrew Isaac Health Center, and others	Chena-Goldstream Fire and Rescue; Fairbanks Fire Department; and others	4	hw, ap, sp
Fox	No	No	Fox Volunteer Fire/EMS Department	1-Highway	ap, r, s
North Pole	No	No	North Pole Fire Department; North Star Volunteer Fire Department	2-Highway	hw, ap, sp, s
Salcha	No	No	Salcha Fire and Rescue	1-Highway	hw, a
Denali Borough					
Anderson	No	No	Anderson Fire Department/EMS	1-Isolated	hw, a, s
Cantwell	No	Cantwell Clinic	Cantwell Volunteer Ambulance	1-Isolated	hw, a, hp
Healy	No	Healy Clinic; Tri-Valley Community Center	Denali National Park Ambulance	2-Isolated	hw, a
McKinley Park	No	No	Denali National Park Ambulance	1-Isolated	hw, a
Matanuska-Susitna Borough					
Big Lake	No	No	Big Lake Volunteer Fire/EMS Department	2-Highway	hw, a, s
Houston	No	No	Houston Volunteer Fire/EMS Department	1-Highway	hw, h, s
Knik-Fairview	No	No	Knik Volunteer Fire/EMS Department	1-Highway	hw, c, h, s
Palmer	Mat-Su Regional Medical Center	No	Matanuska-Susitna Borough EMS	4	hw, a, sp, h
Talkeetna	No	Sunshine Community Health Center	Talkeetna Volunteer Fire/EMS Department	2-Highway	hw, a, hp
Trapper Creek	No	No	Trapper Creek EMS	1-Highway	hw, a
Wasilla	No	Mat-Su Health Services; Providence Matanuska Health Care	Matanuska-Susitna Borough EMS	2-Highway	lh, m, c, fp, h, s
Willow	No	Willow Clinic	Willow Volunteer Fire/EMS Department	1-Highway	hw, a
Point MacKenzie	No	No	No	—	—
Kenai Peninsula Borough					
Moose Pass	No	No	Moose Pass Volunteer Fire Department and EMS	1-Highway	hw, h, s
Nikiski	No	No	Nikiski Fire Department	2-Highway	hw, c, h
Salamatof	No	No	No	1-Highway	hw, c, a
Sterling	No	No	Central Emergency Services (Soldotna)	2-Highway	hw, h, s

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TABLE 5.3.4-3					
Medical Services in the Area of Interest					
Area	Hospitals	Health Clinics and Federally Qualified Health Centers	Emergency Medical Services		
			Local Service Available	Level (see notes)	Access (see notes)
Soldotna	Central Peninsula Hospital	Cottonwood Health Center	Central Emergency Services (Soldotna)	4	hw, ap, sp
Kenai	No	Kenai Health Center	Kenai Fire Department	2-Highway	hw, c, ap, sp, s
Seward	Providence Seward Medical Center	North Star Health Clinic-Chugachmiut; Seward Public Health Center	Bear Creek Fire/EMS Department; Seward Volunteer Ambulance Corp.; Seward Fire Department	3	hw, lm, ap
Cooper Landing	No	Cooper Landing Health Center, Inc. (seasonal)	Cooper Landing Volunteer Ambulance, Inc.	1-Highway	hw, a, r, l
Tyonek	No	Indian Creek Health Clinic	Tyonek Volunteer Fire Department	1-Isolated	c, a
Municipality of Anchorage	Alaska Native Medical Center; Alaska Regional Hospital; Providence Alaska Medical Center; Anchorage Military Hospital	Anchorage Neighborhood Health Center	Anchorage Fire Department; and others	5	hw, c, ap, sp, hp
Eklutna ANVSA	No	Eklutna Village Clinic (Chugiak)	Chugiak Volunteer Fire and Rescue	—	—
Southeast Fairbanks Census Area					
Delta Junction	No	Delta Junction Family Medical Center; Delta Junction Public Health Center; Fairbanks Memorial Hospital	Delta Junction Volunteer Fire Department; Delta Rescue Squad; Dry Creek EMT Response Team; Rural Deltana Volunteer Fire Department	2-Isolated	hw, ap
Big Delta	No	Delta Junction Family Medical Center; Fairbanks Memorial Hospital	Rural Deltana Volunteer Fire Department; Delta Junction Rescue Squad	2-Isolated	hw, a, s
Valdez-Cordova Census Area					
Copper Center	No	Kluti-Kaah Health Clinic	Copper Center Volunteer Fire/EMS Department	1-Isolated	hw, a, s
Gakona	No	Gakona Health Clinic	Gakona Volunteer Fire/EMS Department	1-Isolated	hw, a, s
Glennallen	No	Cross Road Medical Center	Copper River EMS Council	2-Isolated	hw, h
Gulkana	No	Gulkana Community Clinic	Gulkana Volunteer Fire/EMS Department	1-Isolated	a, s
Paxson	No	No	Paxson Volunteer Fire/EMS Department	1-Isolated	hw, l, a
Tazlina	No	Tazlina Health Clinic	Tazlina Volunteer Fire/EMS Department	1-Isolated	hw, a, sp, s
Tonsina	No	No	Tonsina Volunteer Fire/EMS Department	1-Isolated	hw, a

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TABLE 5.3.4-3					
Medical Services in the Area of Interest					
Area	Hospitals	Health Clinics and Federally Qualified Health Centers	Emergency Medical Services		
			Local Service Available	Level (see notes)	Access (see notes)
Valdez	No	Providence Valdez Medical Center; Valdez Medical Clinic; Valdez Public Health Center	Valdez Fire Department	3	h, m, ap
Whittier	No	Whittier Community Health Center	Whittier Volunteer Fire/EMS Department	2-Isolated	lh, m, a
Other - City of Unalaska	No	Ounalaska Wellness Center	Unalaska Fire / Emergency Medical Services	2-Isolated	lh, lm, ap
<p>Source: Alaska Department of Health and Social Services (2014a); Alaska Department of Health and Social Services (2014b); Alaska Department of Health and Social Services (2015)</p> <p>Notes:</p> <p>Level</p> <p>1-Isolated: Limited air or marine highway access to a Level 3 or higher community; road access exceeds 60 miles.</p> <p>1-Highway: Limited air or marine highway access to a Level 3 or higher community; year-round, 60 minute or less road access.</p> <p>2-Isolated: Marine highway or daily air access to closest Level 3 or higher community; air service to Level 1 communities in area.</p> <p>2-Highway: Marine highway or daily air access to closest Level 3 or higher community; year-round, 60 minute or less road access.</p> <p>3: Daily airline service to Level 3, 4 & 5 communities; air service to Level 1 & 2 communities in area; road or marine highway access all year.</p> <p>4, 5: Daily airline service to Level 2, 3, 4 & 5 communities; road or marine highway access all year.</p> <p>Access</p> <p>hw: Linked to the Alaska highway network throughout the year.</p> <p>sh: Linked to the Alaska highway network during the summer only.</p> <p>lh: Outlying roads but no linkage to the Alaska highway network.</p> <p>m: Linked by the Alaska marine highway system.</p> <p>lm: Occasional marine highway service.</p> <p>c: Ocean access without linkage to the marine highway system.</p> <p>r: Along a river used as a primary transportation route (boating, winter ice road).</p> <p>l: Along a lake used as a primary transportation route (boating, winter ice road).</p> <p>a: Authorized landing area with small plane capacity only.</p> <p>ap: Authorized landing area with regular, scheduled commercial air service.</p> <p>sp: Designated landing area for float planes (seaplanes).</p> <p>fp: Landing area available for float planes (seaplanes).</p> <p>h: Landing area available for helicopters.</p> <p>hp: Designated landing area for helicopters.</p> <p>An "—" indicates that the measure is unavailable.</p>					

5.3.4.3 Police and Fire Protection Services

As shown in Table 5.3.4-4, city or borough police departments, as well as Village Public Safety Officers (VPSOs), provide law enforcement services in boroughs and communities in the AOI; however, law enforcement in most rural areas of the state primarily is the responsibility of the Division of Alaska State Troopers (Division) under the Alaska Department of Public Safety (Alaska Department of Public Safety 2014a). The Division consists of posts that provide patrol, enforcement, and search and rescue to all areas of the state and a central headquarters. The Division has four bureaus: the Alaska Bureau of Investigation which investigates major crimes; the Alaska Bureau of Alcohol and Drug Enforcement which enforces bootlegging and illegal drug distribution throughout Alaska; the Alaska Bureau of Judicial Services which

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is responsible for prisoner transports and providing security for Alaska courts; and the Alaska Bureau of Highway Patrol which is responsible for highway safety (Alaska Department of Public Safety 2014a).

Alaska State Troopers respond to emergencies, felonies, and misdemeanor cases as promptly as circumstances allow. Their efforts, however, often are hampered by delayed notification, long response distance, and the uncertainties of weather and transportation. In some rural villages, VPSOs assist their communities in all aspects of public safety, including law enforcement, fire protection, and search and rescue (Alaska Department of Public Safety 2014b). VPSOs are employed by Alaska Native non-profit corporations and supervised by the Alaska State Troopers. In communities with a VPSO Program, citizens enjoy timely response to emergencies without delays caused by weather, distance, or budgetary restraints. VPSOs are not expected to handle high-risk or complex investigative situations, but are the “First Responders” to all volatile situations in their communities. Part of their job involves stabilizing volatile situations and protecting crime scenes until State Troopers can arrive. VPSOs frequently conduct and complete misdemeanor and minor felony investigations with assistance from State Troopers (Alaska Department of Public Safety 2014b). The closest law enforcement facility for those communities without a police department, VPSO, or Alaska State Trooper post is listed in Table 5.3.4-4.

While some communities in the AOI maintain fire departments staffed with career firefighters, volunteers provide fire protection services in most communities. Generally, these departments are responsible for all structural firefighting within their jurisdictional boundaries. Wildland fire management in Alaska is an interagency effort involving the U.S. Bureau of Land Management, Alaska Fire Service; Alaska Department of Natural Resources, Division of Forestry; and the U.S. Forest Service. The Alaska Interagency Coordination Center, located at Fort Wainwright, serves as the focal point for initial attack resource coordination, logistics support, and predictive services for all state and federal agencies involved in wildland fire management and suppression in Alaska. In addition, the Alaska Interagency Coordination Center provides coordination and support for all-hazard emergency response activities for federal landholding agencies in Alaska (Alaska Interagency Coordination Center 2014). The U.S. Bureau of Land Management Alaska Fire Service provides wildland fire suppression services for all U.S. Department of the Interior and Alaska Native Corporation lands in Alaska (Alaska Fire Service 2014).

TABLE 5.3.4-4					
Police and Fire Protection Services in the Area of Interest					
	Local or Borough Police Department	Village Public Safety Officer	Alaska State Trooper Post	Nearest Law Enforcement Facility	Local or Borough Fire Department
North Slope Borough	Yes				Yes
Anaktuvuk Pass	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Atkasuk	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Barrow	Yes	No	Yes	North Slope Borough Police Department/Barrow State Troopers Post	Yes (North Slope Borough Fire Department)
Kaktovik	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes

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TABLE 5.3.4-4 Police and Fire Protection Services in the Area of Interest					
	Local or Borough Police Department	Village Public Safety Officer	Alaska State Trooper Post	Nearest Law Enforcement Facility	Local or Borough Fire Department
Nuiqsut	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Point Hope	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Point Lay	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Prudhoe Bay	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Wainwright	Yes	No	No	North Slope Borough Police Department/Barrow State Troopers Post	Yes
Yukon-Koyukuk Census Area	No				No
Coldfoot	No	No	Yes		No
Livengood	No	No	No	Fairbanks State Troopers Post	No
Nenana	No	Yes	Yes		Yes
Wiseman	No	No	No	Fairbanks State Troopers Post	No
Fairbanks North Star Borough	No				No
Fairbanks	Yes	Yes	Yes		Yes
Denali Borough	No				No
Anderson	No	No	No	Fairbanks State Troopers Post	Yes
Cantwell	No	No	Yes		Yes
Healy	No	No	Yes		Yes
McKinley Park	No	No	No	Healy State Troopers Post	Yes
Matanuska-Susitna Borough	No				No
Big Lake	No	No	No	Palmer State Troopers Post	Yes
Houston	Yes	No	No		Yes
Knik-Fairview	No	No	No	Palmer State Troopers Post	No
Palmer	Yes	No	Yes		Yes
Point MacKenzie	No	No	No	Palmer State Troopers Post	No
Talkeetna	No	No	Yes		Yes
Trapper Creek	No	No	No	Talkeetna State Troopers Post	
Wasilla	Yes	No	No		Yes
Willow	No	No	No	Talkeetna State Troopers Post	Yes

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TABLE 5.3.4-4 Police and Fire Protection Services in the Area of Interest					
	Local or Borough Police Department	Village Public Safety Officer	Alaska State Trooper Post	Nearest Law Enforcement Facility	Local or Borough Fire Department
Kenai Peninsula Borough	No				No
Cooper Landing	No	No	Yes		Yes
Kenai	Yes	No	No		Yes
Moose Pass	No	No	No	Seward State Troopers Post	Yes
Nikiski	No	No	No	Soldotna State Troopers Post	Yes
Salamatof	No	No	No	Soldotna State Troopers Post	Yes
Seward	Yes	No	Yes		Yes
Soldotna	Yes	No	Yes		Yes
Sterling	No	No	No	Soldotna State Troopers Post	Yes
Tyonek	No	No	No	Soldotna State Troopers	Yes
Municipality of Anchorage	Yes	No	Yes		Yes
Eklutna ANVSA	No	No	No	Anchorage Police Department and State Troopers Post	Yes
Southeast Fairbanks Census Area	No				No
Big Delta	No	No	No	Delta State Troopers Post	No
Delta Junction	No	No	Yes		Yes
Valdez-Cordova Census Area	No				No
Copper Center	No	Yes	No		No
Gakona	No	Yes	No		No
Glennallen	No	No	Yes		No
Gulkana	No	Yes	No		No
Paxson	No	No	No	Delta State Troopers Post	No
Tazlina	No	Yes	No	Glennallen State Troopers Post	No
Tonsina	No	No	No	Glennallen State Troopers Post	No
Valdez	Yes	No	Yes		Yes
Whittier	Yes	No	No		Yes
Other - City of Unalaska	Yes	No	Yes		Yes
Source: Alaska Department of Public Safety (2014c); Alaska Department of Public Safety (2014b); Collins (2014)					

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5.3.4.4 Utilities

Table 5.3.4-5 documents the provision of local utilities (water, sewer, solid waste, electric, natural gas) to communities within the AOI by identifying the local communities' service providers by utility type. While more urbanized areas have modern public utility systems, the systems in rural areas typically are limited. Many rural communities do not have community piped potable water or sewage treatment systems. Water in these communities generally is provided by individual household wells, and sewage treatment facilities consist of individual septic systems or communal sewage lagoons. Households in some small rural villages lack flush toilets and running water. Refuse generally is hauled to the borough, city, or village council landfills. Most rural communities have Class III landfills that do not meet the requirements of the federal Resource Conservation and Recovery Act (Colt et al. 2003).

The day-to-day operating costs of water, sewer, solid waste, and electric utility systems in rural Alaska are high (Colt et al. 2003). With small customer bases and limited revenue, many, if not most, utility systems in rural areas are not self-supporting. The difference between customer payments and the actual cost of day-to-day operations is made up by the power cost equalization program, general city/borough revenues, several state and federal assistance programs, and the deferral or avoidance of maintenance, with public agencies often paying for major repairs or premature replacement (Colt et al. 2003).

TABLE 5.3.4-5 Utility Providers in the Area of Interest					
Borough or Census Area	Community Piped Water System Operator	Community Piped Sewage System Operator	Landfill Facility Operator	Electric Utility Operator	Natural Gas Utility Operator
North Slope Borough					
Anaktuvuk Pass	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Atkasuk	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Barrow	Cooperative	Cooperative	Borough	Barrow Utilities & Electric Cooperative	Barrow Utilities & Electric Cooperative
Kaktovik	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Nuiqsut	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Point Hope	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Point Lay	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Prudhoe Bay	No	No	Borough	TDX North Slope Generating	No
Wainwright	Borough	Borough	Borough	North Slope Borough Power and Lights Systems	No
Yukon-Koyukuk Census Area					
Coldfoot	No	No	Borough	Individual generators	No
Livengood	No	No	Borough	Individual generators	No

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TABLE 5.3.4-5 Utility Providers in the Area of Interest					
Borough or Census Area	Community Piped Water System Operator	Community Piped Sewage System Operator	Landfill Facility Operator	Electric Utility Operator	Natural Gas Utility Operator
Manley Hot Springs					
Minto					
Nenana	City	City	Borough	Golden Valley Electric Association	No
Wiseman	No	No	Borough	Individual generators	No
Fairbanks North Star Borough					
Fairbanks	Private/State	Private/State	Borough	Aurora Energy/Golden Valley Electric Association	Fairbanks Natural Gas/Interior Gas Utility
Denali Borough					
Anderson	City	City	Borough	Golden Valley Electric Association	No
Cantwell	No	No	Borough	Golden Valley Electric Association	No
Healy	No	No	Borough	Golden Valley Electric Association	No
McKinley Park	No	No	Borough	Golden Valley Electric Association	No
Matanuska- Susitna Borough					
Big Lake	No	No	Borough	Matanuska Electric Association	ENSTAR
Houston	No	No	Borough	Matanuska Electric Association	ENSTAR
Knik-Fairview	No	No	Borough	Matanuska Electric Association	ENSTAR
Palmer	City/Private	City	Borough	Enerdyne/Matanuska Electric Association	ENSTAR
Point MacKenzie	No	No	Borough	Matanuska Electric Association	No
Skwentna	No	No	No	No	No
Talkeetna	City	City	Borough	Matanuska Electric Association	No
Trapper Creek	No	No	Borough	Matanuska Electric Association	No
Wasilla	City/Private	City	Borough	Matanuska Electric Association	ENSTAR
Willow	No	No	Borough	Matanuska Electric Association	No
Kenai Peninsula Borough					
Cooper Landing	No	No	Borough	Chugach Electric Association	No
Kenai	City/Private	City	Borough	Homer Electric Association	ENSTAR

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TABLE 5.3.4-5 Utility Providers in the Area of Interest					
Borough or Census Area	Community Piped Water System Operator	Community Piped Sewage System Operator	Landfill Facility Operator	Electric Utility Operator	Natural Gas Utility Operator
Moose Pass	No	No	Borough	Chugach Electric Association	No
Nikiski	No	No	Borough	Homer Electric Association	ENSTAR
Salamatof	No	No	Borough	Homer Electric Association	ENSTAR
Seward	City/Private	City	Borough	City of Seward	No
Soldotna	City/Private	City	Borough	Homer Electric Association	ENSTAR
Sterling	No	No	Borough	Homer Electric Association	ENSTAR
Tyonek	Village Council	Village Council	Borough	Chugach Electric Association	No
Municipality of Anchorage	City/Private	City	City	Chugach Electric Association/Anchorage Municipal Light and Power	ENSTAR
Eklutna ANVSA	Village Council/Private	No	City (Anchorage)	Matanuska Electric Association	ENSTAR
Southeast Fairbanks Census Area					
Big Delta	No	No	No	Golden Valley Electric	No
Delta Junction	No	No	City	Golden Valley Electric	No
Valdez-Cordova Census Area					
Copper Center	No	No	AHTNA, INC., Inc., Kluti-Kaah Corporation	Copper Valley Electric Association	No
Gakona	No	No	No	Copper Valley Electric Association	No
Glennallen	No	Private	Private	Copper Valley Electric Association	No
Gulkana	Village Council	Village Council	Private	Copper Valley Electric Association	No
Paxson	No	No	No	Paxson Lodge	No
Tazlina	No	No	No	Copper Valley Electric Association	No
Tonsina	No	No	No	Copper Valley Electric Association	No
Valdez	City	City	City	Copper Valley Electric Association	No
Whittier	City	No	Municipality of Anchorage	Chugach Electric Association	ENSTAR
Other - City of Unalaska	City	City	City	City	No
Source: Alaska Department of Commerce, Community and Economic Development (2014b)					

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Alaska's electrical energy infrastructure differs from that in the rest of the U.S. in that there is no extensive infrastructure of transmission interties that span the state or connect to the grid in Canada or the contiguous U.S. The electrical needs of some communities in the AOI currently are served by public utilities connected to a regional transmission line owned by the Alaska Energy Authority. These utilities include Chugach Electric Association, Golden Valley Electric Association, Homer Electric Association, Matanuska Electric Association, Copper Valley Electric Association and Anchorage's Municipal Light & Power (ML&P). However, smaller, more isolated communities typically generate electricity with isolated diesel generators that are not tied into regional grids.

Among the utilities connected to the regional transmission line, ML&P provides electricity at the lowest rate, due primarily to lower fuel costs. The utility uses natural gas-fired generators to produce most of its electricity. Moreover, ML&P's cost for gas, which comes from its one-third ownership in the Beluga River Gas Field, is around half of what other utilities pay privately owned producers of Cook Inlet natural gas (Bradner, 2011). Golden Valley Electric Association charges the highest rates; in 2012, the utility's average residential rate was around twice that of ML&P (U.S. Energy Information Administration, 2014b). The comparatively high rate reflects Golden Valley Electric Association's heavy reliance on oil-fired generation.

ENSTAR Natural Gas Company supplies natural gas produced in Cook Inlet to many residences and businesses in Southcentral Alaska. In addition, gas from the ENSTAR distribution system is liquefied in a small facility in Point MacKenzie and transported by cryogenic tanker trailers to a storage and pipeline distribution system in Fairbanks that is operated by Fairbanks Natural Gas. The Interior Gas Utility has been formed to develop a distribution system in Fairbanks that is outside of the Fairbanks Natural Gas service area. Currently, nearly 70 percent of Alaskans rely on gas from Cook Inlet to heat homes and businesses and generate electricity (Larsen et al., 2006). The Barrow Utilities & Electric Cooperative distributes piped natural gas produced on the North Slope to residences and businesses in Barrow.

Remote communities use petroleum products, such as diesel and heating oil, not only for electric generation but also home heating. In the last several years, higher oil prices have led to higher prices for these petroleum products, thus raising the cost of electricity and home heating for many rural communities. When the low level of per capita income in rural Alaska is taken into account, residents of those communities expend a much larger share of their household income on utilities than do Anchorage residents, who have access to natural gas service (Saylor et al., 2008).

5.3.5 Revenue and Expenditures

The following section provides information on revenues and expenditures for the State of Alaska, as well as summary information for local governments in the AOI.

5.3.5.1 State of Alaska

Alaska does not charge personal income or sales taxes. The primary sources of state revenue are oil taxes and royalties, funding from the federal government, and investment earnings, primarily from the Permanent Fund.

Total state revenue in FY2013 was \$15.8 billion. State revenue per capita, at \$19,686 in 2012, was the highest in the U.S. (Tax Foundation, 2014). The well-being of the state is best reflected in the General

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Fund, the state's primary operating fund, which maintains many accounts and subfunds (created by law) that are accounted for and reported within the General Fund. Four of the most notable are the Constitutional Budget Reserve, the Statutory Budget Reserve, the Permanent Fund Dividend, and Public Education. Of the \$10.3 billion in general fund revenue in FY2013, about 60 percent was petroleum revenue. The other major fund is the Alaska Permanent Fund, which receives at least twenty-five percent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments, and bonuses received by the State. Permanent Fund revenue was \$5.3 billion in FY2013. By statute, the principal is used only for those income-producing investments specifically designated by law as eligible for permanent fund investments. All income from the Permanent Fund is deposited in the General Fund unless otherwise provided by law. Together the General and Permanent Funds represent 96.6 percent of total government-wide cash and investments (Alaska Department of Administration, 2013).

Oil contributes a significant segment of state revenue. The revenues from oil and gas activities include a severance tax based on the value of oil produced; property taxes (although most of this tax revenue is passed through to the local jurisdiction within which the infrastructure is located); corporate income taxes; and royalties, bonuses, and lease payments based on the value of oil production on state land. Since statehood, Alaska has received \$164 billion in revenues from oil; further, oil and tax royalties have generated approximately 80 percent of Alaska's unrestricted general fund revenue for over two decades (Fried, 2013; Alaska Department of Revenue, 2014; Resource Development Council for Alaska, 2014). In 2013, the \$7.39 billion in oil revenues the state collected accounted for 47 percent of total revenues according to the Alaska Department of Revenue's Revenue Sources Book (Alaska Department of Revenue, 2014). This report, which is released each spring and fall, is unaudited, but contains information about petroleum revenues not included in the state's Comprehensive Annual Financial Report.

Oil also is important to Alaska's fiscal health and overall economy because it is the funding source for the Alaska Permanent Fund, which is Alaska's largest financial asset. The Permanent Fund was established in 1976 as a savings account to hold a share of the state royalties from oil production. Since the Permanent Fund's inception, the Alaska constitution has required that 25 percent of royalties be deposited into the fund. In addition, the state has made annual deposits since the early 1980s to offset the erosion of the value of the fund due to inflation, and, on occasion, special deposits also have been added to the principal, which, by law, cannot be spent. The fund is invested in a diverse portfolio of stocks, bonds, and real estate, and had grown in value to a record-high of \$50.0 billion as of February 2014 (Alaska Permanent Fund Corporation, 2014).

The rationale for establishment of the Permanent Fund was that the fund would grow over time as oil production declined, and eventually the earnings of the fund would replace oil production as a source of revenues to help support necessary public spending on education and other public programs (Alaska Permanent Fund Corporation, 2014). In addition, to ensure that all Alaska residents benefited from oil production on state-owned lands, the state legislature passed a plan in 1982 whereby each resident, regardless of age, is paid annually an equal amount out of the appropriable earnings of the Permanent Fund (Goldsmith, 2010b). This annual dividend has significantly increased the discretionary income of all Alaskan households.

Federal government funding also figures largely in the state's revenue picture and is generally restricted to specific uses such as Medicaid payments, aid to schools, and capital projects such as road improvements. Most federal funding requires state-matching funds. Overall, in FY2013, Alaska spent

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\$642.3 million and received \$2.4 billion to fund specific programs. This means Alaska received roughly \$3.71 in federal funds for each dollar it spent in matching state funds (Alaska Department of Revenue, 2014). Much of the funding went to Medicaid via the state Department of Health and Social Services. Taken together, the Department of Education and University of Alaska were the second-largest federal funding recipients. State total government revenues are summarized in Table 5.3.5-1.

TABLE 5.3.5-1 State of Alaska Total Government Revenues by Source			
State Total Government Revenues	\$ Thousands		
	FY 2013	FY 2012	FY 2011
Taxes	4,787,355	7,186,196	5,381,479
Licenses and Permits	147,790	148,058	147,331
Charges for Services	194,058	197,276	179,554
Fines and Forfeitures	30,615	13,732	11,867
Rents and Royalties	2,807,255	2,996,900	2,779,564
Premiums and Contributions	25,949	23,363	28,790
Interest and Investment Income (Loss)	5,248,270	344,378	8,139,303
Federal Grants in Aid	2,434,288	2,500,941	2,442,957
Payments in from Component Units	31,336	39,463	42,866
Other Revenues	101,707	66,759	53,920
Total Revenues	15,808,623	13,517,066	19,207,631
Source: Alaska Department of Administration (2011); Alaska Department of Administration (2012); Alaska Department of Administration (2013)			
Notes: Permanent Fund revenues are included in Rents and Royalties and Interest and Investment Income.			

Public expenditures per capita have fallen since 1990 as population growth in Alaska has outpaced the ability of the state to fund expenditure programs. Nevertheless, state expenditures per capita still are currently the highest in the nation, primarily because of the harsh climate, low population density, and the inaccessibility of many communities, which make the services provided by state agencies very costly (U.S. Department of the Interior, 2002). The largest components of state government expenditures in FY2013 were health and human services followed by education and transportation. State general fund expenditures for FY2013 are summarized in Table 5.3.5-2.

Health and human services in 2013 constituted 28 percent of total state general fund expenditures. The bulk of Alaska Department of Health and Social Services spending, or 61 percent, went to Medicaid services (Alaska Department of Health and Social Services, 2013).

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TABLE 5.3.5-2 State of Alaska Total Government Expenditures by Use			
State General Fund expenditures	\$ Thousands		
	FY 2013	FY 2012	FY 2011
Current			
General Government	588,288	491,697	481,434
AK Permanent Fund Dividend	562,621	757,576	817,894
Education	2,081,438	1,899,380	1,835,425
University	568,805	491,857	449,248
Health and Human Services	2,741,002	2,573,858	2,427,974
Law and Justice	271,633	278,809	238,083
Public Protection	736,133	734,059	784,268
Natural Resources	399,938	384,167	379,151
Development	707,665	595,362	893,417
Transportation	1,277,201	1,146,767	1,103,655
Intergovernmental Revenue Sharing	288,281	254,525	189,796
Debt Service			
Principal	97,959	134,825	47,229
Interest and Other Charges	64,891	77,816	44,201
Total State General Fund Expenditures	10,385,855	9,820,698	9,691,775
Source: Alaska Department of Administration (2011); Alaska Department of Administration (2012); Alaska Department of Administration (2013)			

5.3.5.2 Local Government Finances

Table 5.3.5-3 identifies sources and levels of revenues collected by local governments within the AOI. A substantial percentage of local government revenues come in the form of transfers from the state, primarily as direct state funding of local education programs, and from the federal government. Much of this funding is derived from state oil revenues. Local taxes also are an important source of revenue for some boroughs. Revenues from oil and gas property taxes play an especially large role in generating tax revenues for the North Slope Borough and are the borough's main source of capital and operating revenue. Other property taxes constitute a large share of total revenues in the Fairbanks North Star Borough, Matanuska-Susitna Borough, and Municipality of Anchorage. About 61 percent of the Denali Borough's revenue came from hotel/motel "bed" tax collections in 2012. Enterprise fund earnings account for a large proportion of the Kenai Peninsula Borough's revenues because two hospitals (South Peninsula Hospital and Central Peninsula Hospital) organized under the authority of the borough are reported as enterprise funds.

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TABLE 5.3.5-3

Local Government Revenues by Source in the Area of Interest, 2012

Borough or Census Area	Property Tax	Oil & Gas Property Tax	Other Taxes	Other Fees and Charges	Inter-governmental Transfers	Other General Fund Revenues	Non-General Fund Revenues	Enterprise/ Business Funds	Total
	\$ Thousands								
North Slope Borough	6,182	308,176	0	6,198	21,579	74,985	517	36,838	454,476
Anaktuvuk Pass	0	0	0	29	208	4	0	0	241
Atkasuk	0	0	0	12	182	14	0	418	626
Barrow	0	0	406	640	2,315	83	6,410	0	9,855
Kaktovik	0	0	0	231	551	86	0	0	868
Nuiqsut	0	0	74	0	213	557	743	0	1,586
Point Hope	0	0	0	1	534	114	0	0	648
Point Lay	—	—	—	—	—	—	—	—	—
Prudhoe Bay	—	—	—	—	—	—	—	—	—
Wainwright	0	0	0	25	355	45	0	0	425
Yukon-Koyukuk Census Area	—	—	—	—	—	—	—	—	—
Coldfoot	—	—	—	—	—	—	—	—	—
Livengood	—	—	—	—	—	—	—	—	—
Manley Hot Springs	—	—	—	—	—	—	—	—	—
Minto	—	—	—	—	—	—	—	—	—
Nenana	297	0	0	173	640	25	62	348	1,546
Wiseman	—	—	—	—	—	—	—	—	—
Fairbanks North Star Borough	90,342	9,002	3,622	2,002	16,196	2,135	32,311	14,057	169,667
Fairbanks	13,971	157	5,546	7,787	4,997	866	18,249	598	52,171
Denali Borough	0	0	2,685	0	1,076	27	260	352	4,400
Anderson	0	0	0	25	149	1	0	112	287
Cantwell	—	—	—	—	—	—	—	—	—
Healy	—	—	—	—	—	—	—	—	—
McKinley Park	—	—	—	—	—	—	—	—	—

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TABLE 5.3.5-3

Local Government Revenues by Source in the Area of Interest, 2012

Borough or Census Area	Property Tax	Oil & Gas Property Tax	Other Taxes	Other Fees and Charges	Inter-governmental Transfers	Other General Fund Revenues	Non-General Fund Revenues	Enterprise/ Business Funds	Total
	\$ Thousands								
Matanuska-Susitna Borough	76,243	109	4,224	3,417	24,457	237	64,162	6,293	179,141
Big Lake	—	—	—	—	—	—	—	—	—
Houston	413	0	0	83	276	11	674	0	1,457
Knik-Fairview	—	—	—	—	—	—	—	—	—
Palmer	1,225	—	—	2,618	1,386	168	973	3,298	9,669
Point MacKenzie	—	—	—	—	—	—	—	—	—
Skwentna	—	—	—	—	—	—	—	—	—
Talkeetna	—	—	—	—	—	—	—	—	—
Trapper Creek	—	—	—	—	—	—	—	—	—
Wasilla	—	0	0	2,007	2,137	116	1,561	6,014	11,835
Willow	—	—	—	—	—	—	—	—	—
Kenai Peninsula Borough	26,244	3,748	0	0	9,749	2,349	37,272	156,219	235,581
Cooper Landing	—	—	—	—	—	—	—	—	—
Kenai	2,492	89	—	2,094	1,991	568	3,961	—	11,195
Moose Pass	—	—	—	—	—	—	—	—	—
Nikiski	—	—	—	—	—	—	—	—	—
Salamatof	—	—	—	—	—	—	—	—	—
Seward	1,033	0	346	2,708	1,953	109	4,444	37,797	48,390
Soldotna	602	—	—	164	801	310	2,004	—	3,882
Sterling	—	—	—	—	—	—	—	—	—
Tyonek	—	—	—	—	—	—	—	—	—
Municipality of Anchorage	488,741	3,964	45,962	50,970	48,818	5,711	143,628	288,274	1,076,070
Eklutna ANVSA	—	—	—	—	—	—	—	—	—

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TABLE 5.3.5-3

Local Government Revenues by Source in the Area of Interest, 2012

Borough or Census Area	Property Tax	Oil & Gas Property Tax	Other Taxes	Other Fees and Charges	Inter-governmental Transfers	Other General Fund Revenues	Non-General Fund Revenues	Enterprise/ Business Funds	Total
	\$ Thousands								
Southeast Fairbanks Census Area	—	—	—	—	—	—	—	—	—
Big Delta	—	—	—	—	—	—	—	—	—
Delta Junction	0	0	0	366	1,157	59	200		1,782
Valdez-Cordova Census Area	—	—	—	—	—	—	—	—	—
Copper Center	—	—	—	—	—	—	—	—	—
Copper Center ANVSA	—	—	—	—	—	—	—	—	—
Gakona	—	—	—	—	—	—	—	—	—
Gakona ANVSA	—	—	—	—	—	—	—	—	—
Glennallen	—	—	—	—	—	—	—	—	—
Gulkana	—	—	—	—	—	—	—	—	—
Gulkana ANVSA	—	—	—	—	—	—	—	—	—
Paxson	—	—	—	—	—	—	—	—	—
Tazlina	—	—	—	—	—	—	—	—	—
Tazlina ANVSA	—	—	—	—	—	—	—	—	—
Tonsina	—	—	—	—	—	—	—	—	—
Valdez	4,065	34,833	347	268	5,583	1,925	32,617	15,207	94,846
Whittier	436	9	251	253	531	90	1,129	1,770	4,469
Other - City of Unalaska	3,809		136	210	11,106	1,067	21	30,975	47,324

Source: Alaska Department of Commerce, Community and Economic Development (2014c); Alaska Department of Commerce, Community and Economic Development (2014a)
Notes: An “—” indicates that the measure is unavailable.

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Table 5.3.5-3 also identifies sources and levels of revenues collected by city governments within the AOI. Many, but not all, of the PACs have city governments which typically collect some local taxes, most often sales taxes. In addition, a few communities have enacted special taxes, such as a hotel/motel “bed” tax or alcohol and tobacco tax. Some city governments impose household user fees to operate services such as water, sewer, and washeterias, and have established enterprise funds for that purpose. In addition, a number of city governments utilize gaming activities, such as bingo and pull tabs, to raise revenue without imposing additional taxes on residents or increasing the charges for public services. The limited public services provided by most city governments in the state reflect their modest budgets. In some communities, tribal governments provide limited public services using grant funds as well as revenues derived from operating community retail stores and fuel sales.

The variability of local government expenditures across borough and city governments in the AOI is shown in Table 5.3.5-4. In the North Slope Borough, for example, expenditures on transportation and public works and general government account for a comparatively large component of total expenditures, which reflects the relative isolation of the borough’s communities and their heavy reliance on air transportation as the primary mode of travel.

5.3.6 Transportation

This section describes the characteristics of those Alaska highways, railways, ports, and airports that were identified as being potentially affected by Project-related transportation effects. Transportation facilities that will support the construction and operations of the Project are depicted in Figure 5.3.6-1.

5.3.6.1 Highways

The highways in Alaska that may experience transportation effects during the construction phase of the Project are typically asphalt-paved, two-lane roads except for the Dalton Highway, which is an all-weather gravel road used primarily by trucks servicing the North Slope oil fields. In population centers such as Anchorage and Fairbanks, more than two lanes may exist.

As shown in Table 5.3.6-1, average annual daily traffic counts along a given highway in the AOI can vary depending on location. For example, sections of the Glenn Highway in the Municipality of Anchorage experience more than 60,000 vehicles per day on average, while portions of the Glenn Highway in the Valdez-Cordova Census Area experience traffic counts of less than 3,000 vehicles per day. Moreover, there are substantial differences in traffic volumes across the highways in the AOI. For instance, the highest traffic count on the Dalton Highway is less than one percent of that on the Glenn Highway in Anchorage. Highways may also differ with respect to the type of vehicles driven—most of the traffic on the Dalton Highway is large commercial haulers versus passenger cars on the Glenn Highway (Fay, 2003).

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TABLE 5.3.5-4

Local Government Operating Expenditures by Category in the Area of Interest, 2012

Area	Transportation and Public Works	Education	Public Welfare	Health (including utilities)	Public Safety	Environment & Housing	Government Administration	Debt Service	Other	Total
	\$ Thousands									
North Slope Borough	66,557	44,617	0	25,152	26,316	6,093	66,557	40,348	105,870	381,510
Anaktuvuk Pass	0	0	0	0	0	0	244	0	0	243,942
Atkasuk	0	0	0	0	0	0	295	0	0	294,687
Barrow	872	0	0	0	0	846	1,214	0	150	3,082
Kaktovik	10	0	0	0	0	14	165	0	442	631
Nuiqsut	0	0	0	0	0	0	400	0	0	400
Point Hope	0	0	0	30	0	1,120	451	0	0	1,601,146
Point Lay	—	—	—	—	—	—	—	—	—	0
Prudhoe Bay	—	—	—	—	—	—	—	—	—	0
Wainwright	0	0	84	0	4	0	68	0	0	155,692
Yukon-Koyukuk Census Area	—	—	—	—	—	—	—	—	—	0
Coldfoot	—	—	—	—	—	—	—	—	—	0
Livengood	—	—	—	—	—	—	—	—	—	0
Manley Hot Springs	—	—	—	—	—	—	—	—	—	0
Minto	—	—	—	—	—	—	—	—	—	0
Nenana	110	297	214	0	143	0	303	0	0	1,067,182
Wiseman	—	—	—	—	—	—	—	—	—	0
Fairbanks North Star Borough	6,223	47,359	0	0	1,829	12,235	19,570	0	2,436	89,652
Fairbanks	7,530	0	0	0	14,319	0	9,899	885	719	33,352
Denali Borough	2,070	0	0	0	0	1,162	0	6	2,070	5,308
Anderson	83	0	1	40	24	25	143	0	20	336,926
Cantwell	—	—	—	—	—	—	—	—	—	0
Healy	—	—	—	—	—	—	—	—	—	0
Matanuska-Susitna Borough	4,177	48,048	0	0	7,236	3,545	16,998	0	0	80,004
Big Lake	—	—	—	—	—	—	—	—	—	0
Houston	260	0	0	0	264	0	315	47	17	903

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TABLE 5.3.5-4

Local Government Operating Expenditures by Category in the Area of Interest, 2012

Area	Transportation and Public Works	Education	Public Welfare	Health (including utilities)	Public Safety	Environment & Housing	Government Administration	Debt Service	Other	Total
	\$ Thousands									
Knik-Fairview	—	—	—	—	—	—	—	—	—	0
Palmer	2,035	0	1,254	0	4,460	0	2,482	248	963	11,441,160
Point MacKenzie	—	—	—	—	—	—	—	—	—	0
Skwentna	—	—	—	—	—	—	—	—	—	0
Talkeetna	—	—	—	—	—	—	—	—	—	0
Trapper Creek	—	—	—	—	—	—	—	—	—	0
Wasilla	2,167	0	0	0	6,161	1,835	2,791	420	65	13,439
Willow	—	—	—	—	—	—	—	—	—	0
McKinley Park	—	—	—	—	—	—	—	—	—	0
Kenai Peninsula Borough	5,574	43,898	0	0	598	0	14,878	0	0	64,948
Cooper Landing	—	—	—	—	—	—	—	—	—	0
Kenai	2,334	0	0	0	6,442	1,931	2,702	0	0	13,409,029
Moose Pass	—	—	—	—	—	—	—	—	—	0
Nikiski	—	—	—	—	—	—	—	—	—	0
Salamatof	—	—	—	—	—	—	—	—	—	0
Seward	1,766	0	0	0	3,260	1,678	2,652	809	0	10,165
Soldotna	2,107	0	483	0	2,038	374	1,355	0	0	6,357,911
Sterling	—	—	—	—	—	—	—	—	—	0
Tyonek	—	—	—	—	—	—	—	—	—	0
Municipality of Anchorage	43,955	231,070	0	12,204	202,327	35,482	20,618	55,615	47,084	648,355
Eklutna ANVSA	—	—	—	—	—	—	—	—	—	0
Southeast Fairbanks Census Area	—	—	—	—	—	—	—	—	—	0
Big Delta	—	—	—	—	—	—	—	—	—	0
Delta Junction	167	0	284	171	181	0	479	50	3	1,335,993
Valdez-Cordova Census Area	—	—	—	—	—	—	—	—	—	0

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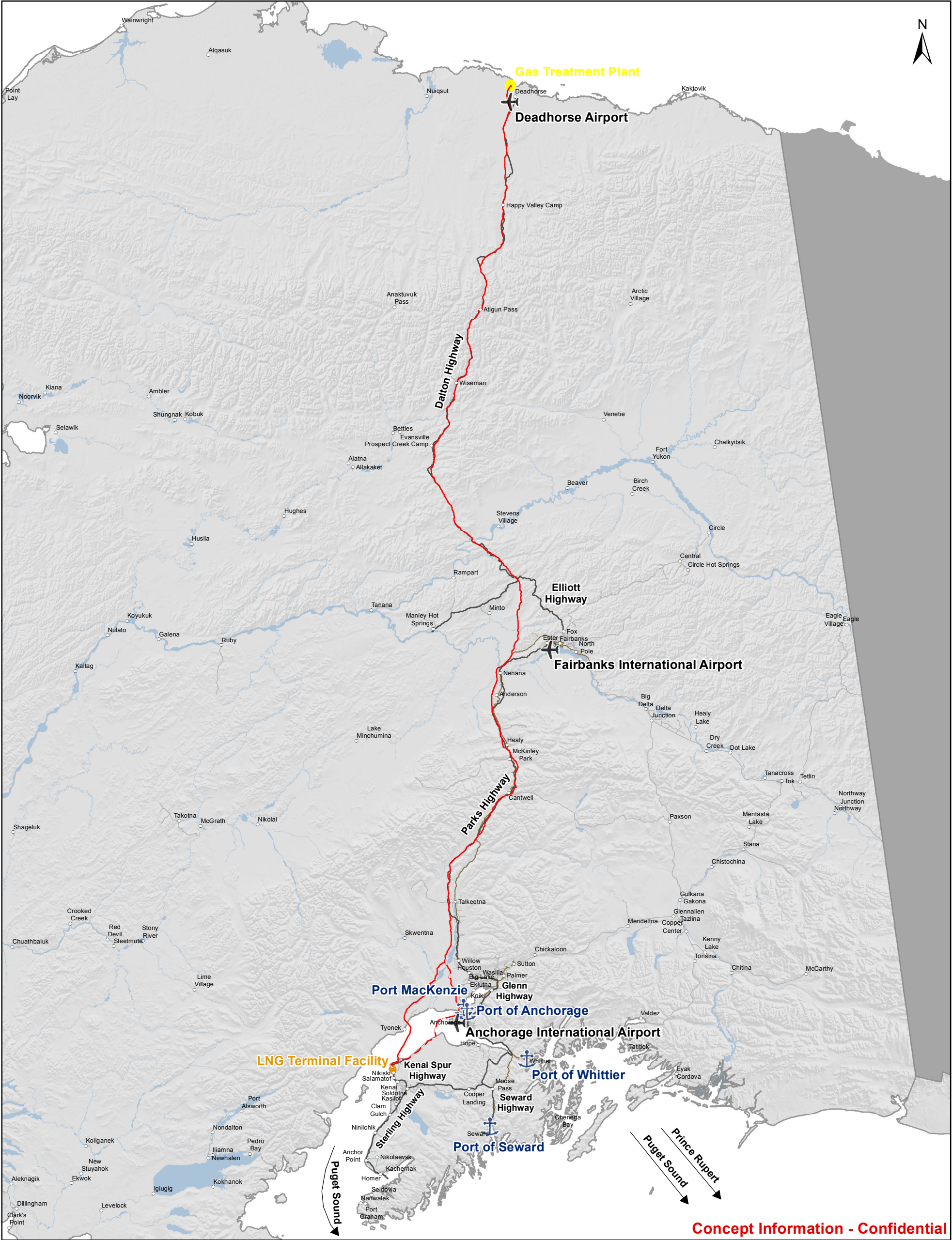
TABLE 5.3.5-4

Local Government Operating Expenditures by Category in the Area of Interest, 2012

Area	Transportation and Public Works	Education	Public Welfare	Health (including utilities)	Public Safety	Environment & Housing	Government Administration	Debt Service	Other	Total
	\$ Thousands									
Copper Center	—	—	—	—	—	—	—	—	—	0
Copper Center ANVSA	—	—	—	—	—	—	—	—	—	0
Gakona	—	—	—	—	—	—	—	—	—	0
Gakona ANVSA	—	—	—	—	—	—	—	—	—	0
Glennallen	—	—	—	—	—	—	—	—	—	0
Gulkana	—	—	—	—	—	—	—	—	—	0
Gulkana ANVSA	—	—	—	—	—	—	—	—	—	0
Paxson	—	—	—	—	—	—	—	—	—	0
Tazlina	—	—	—	—	—	—	—	—	—	0
Tazlina ANVSA	—	—	—	—	—	—	—	—	—	0
Tonsina	—	—	—	—	—	—	—	—	—	0
Valdez	5,115	10,143	3,885	275	4,652	811	6,932	0	0	31,812,838
Whittier	315	0	0	0	714	0	677	14	0	1,720
Other - City of Unalaska	5,203	3,736	688	0	4,308	2,139	4,013	1,231	0	21,317,172

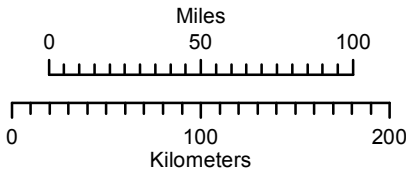
Source: Alaska Department of Commerce, Community and Economic Development (2014c); Alaska Department of Commerce, Community and Economic Development (2014a)

Notes: An “—” indicates that the measure is unavailable.



Transportation Facilities

- Major Airport
- Major Port
- Highways
- Alaska Railroad
- Gas Treatment Plant
- Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)
- Alternative Pre-FEED Pipeline Study Corridor Rev A (8/5/2014)
- LNG Terminal Facility



ALASKA LNG

NOTES:
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DRAWN TCS		MAJOR TRANSPORTATION FACILITIES IN THE STUDY AREA				
CHECK		PROJECTION	DATUM	CONTRACTOR NAME	MAP NUMBER	REV.
DESIGN TCS		AK ALB	NAD83	URS ALASKA	5.3.6-1	A
APPR.		SCALE	DATE	PROJECT NUMBER	ORIG.PAGE SIZE	
		1:4,000,000	27 Jan 2015	26221301	11 X 17	

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TABLE 5.3.6-1

Location Variation in Annual Average Daily Traffic Count on Highways in the Area of Interest, 2012

Area	Dalton Hwy	Parks Hwy	Steese Hwy	Kenai Spur Hwy	Sterling Hwy	Seward Hwy	Knik–Goose Bay Road	Glenn Hwy	Richardson Hwy	Elliott Hwy	Tok Cutoff
North Slope Borough	165-350	—	—	—	—	—	—	—	—	—	—
Yukon-Koyukuk Census Area	150-105	1,482-1,788	60-120	—	—	—	—	—	—	40-540	—
Fairbanks North Star Borough	—	2,449-16,020	110-28,170	—	—	—	—	—	1,195-24,960	485-1,160	—
Denali Borough	—	1,242-3,383	—	—	—	—	—	—	—	—	—
Matanuska-Susitna Borough	—	1,040-33,995	—	—	—	—	205-18,790	793-15,170	—	—	793-15,170
Kenai Peninsula Borough	—	—	—	246-16,010	2,070-18,740	1,568-6,033	—	—	—	—	—
Municipality of Anchorage	—	—	—	—	—	4,852-55,090	—	27,140-60,880	—	—	27,140-60,880
Southeast Fairbanks Census Area	—	—	—	—	—	—	—	—	705-3,920	—	395-840
Valdez-Cordova Census Area	—	—	—	—	—	—	—	742-2,242	320-5,000	—	330-545

Source: Alaska Department of Transportation and Public Facilities (2012)

Notes: An “—” indicates that the measure is unavailable.

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Table 5.3.6-2 shows the seasonal variation in traffic volumes on highways in the AOI. On some highways, such as the Seward and Parks Highways, traffic during the summer can be around triple the winter traffic, as a result of the seasonal upsurge in visitors to Alaska. Annual visitation volume is largely driven by the summer market, which represents 86 percent of full-year volume (McDowell Group, 2014b). A number of highways in the state carry significant levels of recreational and/or slow moving traffic during the summer months, with a relatively high percentage of the total traffic falling under the category of a vehicle pulling a trailer. Significant portions of the Dalton, Steese, Richardson, Parks, and Glenn Highways have received Alaska Scenic Byway status in order to promote their scenic, cultural, and recreational characteristics. A portion of the Parks Highway was designated a National Scenic Byway in October 2009.

TABLE 5.3.6-2 Seasonal Variation in Monthly Average Daily Traffic Count on Highways in the Area of Interest, 2012				
Highway	High Month	Average Daily Traffic Count	Low Month	Average Daily Traffic Count
Elliott Hwy at North Fox	July	1,598	January	698
Parks Hwy at Nenana	July	2,350	January	800
Seward Hwy at Potter Marsh	July	15,709	January	5,476
Glenn Hwy at Anchorage Scalehouse	June	58,845	January	48,206
Richardson Hwy at Valdez	August	6,299	January	3,510
Source: Alaska Department of Transportation and Public Facilities (2012)				

While traffic volume is lower during the winter months, poor weather conditions may result in traffic delays. For example, just north of Valdez on the Richardson Highway is Thompson Pass, a high mountain pass known for treacherous driving conditions during the winter. Thompson Pass can receive up to 1,000 inches of snow in a winter and has very high annual maintenance costs (Fay, 2003). Traffic delays can also occur on Alaska roads in the summer, as that is when road repair and construction projects are generally scheduled; however, the delays are usually minimal.

5.3.6.2 Railroads

Alaska's two rail systems include the Alaska Railroad and the White Pass and Yukon Railway, which is located outside of the AOI. The ARRC owns and operates the Alaska Railroad for the State of Alaska. The Alaska Railroad includes 651 miles of track, over which the ARRC provides freight and passenger service from Seward in the south through Anchorage to Fairbanks in the north. A spur connects Whittier to the mainline near Portage. Dock and handling yards are maintained by the ARRC at the ports of Anchorage, Seward, and Whittier for handling freight reaching Alaska by barge or ship. The Alaska Rail Marine, managed by the ARRC, operates rail-equipped barges year-round that transport freight between Seattle and Whittier. Waterborne rail cars also connect with the Canadian National Railway Company's Aquatrain, which provides freight transport to Alaska from Prince Rupert, British Columbia. A 32-mile spur line, scheduled to be completed in 2016, will connect Port MacKenzie to the ARRC's rail system near Willow (Moffatt & Nichol, 2014). In addition, the ARRC plans to extend the existing rail line from its terminus near the North Pole to a point near Delta Junction (ARRC, 2014a).

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In 2014, the ARRC generated 67 percent of its revenues from freight hauling, 18 percent from passenger service, and 13 percent from real estate operations (ARRC, 2013). Petroleum products such as jet fuel and unleaded gasoline accounted for the majority of freight tonnage, with gravel and general cargo comprising the rest. Tourists accounted for the majority of passenger service, especially during the months from May through September when cruise ship companies provide shore-based trips to and from Denali National Park, Fairbanks, Seward, and Whittier.

Table 5.3.6-3 lists how railroad system information will be provided in a subsequent draft of this Resource Report.

TABLE 5.3.6-3 Summary of Railroad Systems in the Area of Interest						
Railroad System	Area	Primary Freight	Unloading Equipment	Acres of Land Available	Alaska LNG Project Access	
					Existing Line	Distance from the Alaska LNG Project Area
Source: Notes:						

5.3.6.3 Ports, Harbors, and Marine Shipping

Eight Alaska ports were identified as being potentially affected by Project-related transportation needs. Table 5.3.6-4 provides an overview of the characteristics of ports in the AOI, while Table 5.3.6-5 summarizes information on the shipping channels that provide access to these ports. The Ports of Anchorage, Seward, and Whittier have both rail and highway connectivity. Port MacKenzie has highway access and plans for a rail spur to connect to the ARRC mainline. The Port of Valdez offers highway access to the Interior. Dutch Harbor is one of the most productive ports for trans-shipment of cargo in Alaska. The West Dock in Prudhoe Bay supports marine sealifts bringing in oil field supplies and equipment to the Prudhoe Bay/Deadhorse area.

TABLE 5.3.6-4 Harbors and Ports in the Area of Interest				
Harbor/Port	Area	Primary Freight	Current Throughput (short tons)	Distance from the Alaska LNG Project Area (miles)
Prudhoe Bay	North Slope Borough	Construction materials/ petroleum products	—	TBD
Port MacKenzie	Matanuska-Susitna Borough	Bulk commodities/ miscellaneous	—	TBD
Nikiski (Nikishka)	Kenai Peninsula Borough	Crude oil/petroleum products	3,891,093	TBD
Seward	Kenai Peninsula Borough	Coal/containers	964,510	TBD
Anchorage	Municipality of Anchorage	Containers/vehicles/ petroleum products	2,842,912	TBD

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TABLE 5.3.6-4 Harbors and Ports in the Area of Interest				
Harbor/Port	Area	Primary Freight	Current Throughput (short tons)	Distance from the Alaska LNG Project Area (miles)
Valdez (Valdez and Valdez Harbor)	Valdez-Cordova Census Area	Crude oil/petroleum products	28,052,004	TBD
Whittier	Valdez-Cordova Census Area	Containers/railcars	263,054	TBD
Dutch Harbor (Iliuliuk Harbor and Unalaska Island)	Aleutians West Census Area	Seafood/petroleum products	2,097,227	TBD
Source: U.S. Army Corps of Engineers (2012) Notes: An “—” indicates that the measure is unavailable.				

TABLE 5.3.6-5 Marine Shipping in the Area of Interest						
Navigation Channel/ Fairway	Area	Controlling Depth (mean lower low water)	Primary Vessel Traffic	Vessel Traffic Volume		Distance from the Alaska LNG Project Area (miles)
				Average	Peak	
Cook Inlet/ Approach channel north of Fire Island	Matanuska-Susitna Borough	28.5 feet	Bulk cargo ships	TBD	TBD	TBD
Nikiski	Kenai Peninsula Borough	Depth alongside wharves	Tankers/ barges/ LNG ships	TBD	TBD	TBD
Resurrection Bay	Kenai Peninsula Borough	Depth alongside wharves	Fishing vessels/ cruise ships/ Bulk cargo ships	TBD	TBD	TBD
Cook Inlet/ Approach channel north of Fire Island	Municipality of Anchorage	28.5 feet	Container ships	TBD	TBD	TBD
Passage Canal	Valdez-Cordova Census Area	Depth alongside wharves	Fishing vessels/ Tug and barges/ cruise ships	TBD	TBD	TBD
Port Valdez	Valdez-Cordova Census Area	Depth alongside wharves	Fishing vessels/ crude oil tankers	TBD	TBD	TBD
Iliuliuk Bay, Iliuliuk Harbor, Dutch Harbor, Captains Bay	Aleutians West Census Area	Depth alongside wharves	Fishing vessels; containerships	TBD	TBD	TBD
Source: U.S. Department of Commerce (2014c) Notes:						

Additional information on each port in the AOI is presented in the subsections below.

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Port of Anchorage

The Port of Anchorage is a regional port located at the head of Cook Inlet along the Knik Arm. The port is an enterprise department under the Municipality of Anchorage. The port is a key transportation asset in Southcentral Alaska, with direct connections to the Ted Stevens Anchorage International Airport, Alaska highway system, and Alaska Railroad. Deemed “Alaska’s Lifeline,” the port handles roughly 90 percent of the merchandise goods and foodstuffs serving approximately 87 percent of the state’s population (Moffatt & Nichol, 2014). On average, around four million tons of cargo pass through the port each year. Over the last decade, unitized shipments (i.e., vans, flats and containers) accounted for 37 to 52 percent of total annual imports and exports by weight (Moffatt & Nichol 2014). Container cargo ships arrive two times weekly throughout the year. Containers are off-loaded by cranes and roll-on/roll-off transfer bridges. An extensive tank farm adjacent to the port stores liquid fuels that are transported by a petroleum product pipeline from the Tesoro refinery at Nikiski, and imported fuels, primarily jet fuel, for carriers operating at Ted Stevens Anchorage International Airport. The ARRC operates a trailer-on-flat-car facility used to load and unload container vans for shipment to Fairbanks and other destinations. A 220-acre industrial park adjoins the port to the east. Paved storage for unitized cargo occupies approximately 100 acres of container yard and ancillary terminal structures. Additionally, there are 24 acres of port-owned and 56 acres of ARRC-owned liquid bulk storage. The port also has 84 acres of land that could be developed for various uses, subject to limitations (Moffatt & Nichol, 2014).

The Port of Anchorage is currently identifying and updating plans for modernizing the port's facilities. Plans for the modernization project include replacing Terminals 2 and 3, improving seismic resilience of the port, replacing existing obsolete infrastructure and incorporating modern technology, and enhancing operational efficiencies, including adding three new ship-to-shore cranes that will allow for larger container vessels (Port of Anchorage, 2014).

Port of Nikiski

The Port of Nikiski is located on the Kenai Peninsula, and the Sterling Highway connects the port to Anchorage. The Tesoro Alaska oil refinery located near the port processes oil from Cook Inlet and the North Slope into jet fuel, diesel, and gasoline. The port's docks also support offshore drilling.

Docks in Port Nikiski are privately owned and operated primarily for commercial purposes. APC Natchiq owns and operates the Nikiski Rig Tenders Dock for handling equipment and supplies for offshore oil and gas platforms. The Kenai Pipe Line Company and Tesoro Alaska own and operate the Port Nikiski Terminal Wharf which receives crude oil and ships petroleum products. Kenai LNG Corporation, a subsidiary of ConocoPhillips, owns the Kenai LNG Dock, which handles shipments of LNG. Pacific Star Seafoods owns and operates the Kenai Wharf, which is used for receiving seafood and fueling vessels (World Port Source, 2014).

Port of Seward

The Port of Seward is an ice-free, deepwater port located 125 miles south of Anchorage at the southern end of the Seward Highway. The port services cruise ships and exports bulk coal mined in Alaska. The port is served by the ARRC, and the ARRC owns the major industrial and cruise ship docks in the community. The ARRC dock facilities are directly connected to the state’s rail system, which carries freight, resources, and passengers to key hubs in Whittier, Anchorage, Wasilla, Palmer, Denali,

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Fairbanks/North Pole, and communities in between. A large percentage of Seward port users make intermodal connections through the ARRC terminus on the waterfront. Annually, more than 130,000 people and more than 2 million tons of cargo enter or exit Seward via the ARRC dock facilities (Alaska Railroad Corporation, 2014b).

Port of Valdez

The Port of Valdez is an ice-free, deep-water port located in Prince William Sound. Port facilities include the General Cargo and Container Wharf, which is owned by the City of Valdez and operated by the city and North Star Terminal and Stevedore Company. The container terminal has a 700-foot concrete floating dock and containerized roll-on/roll-off and lift-on/lift-off capabilities. The terminal is occupied two or three days a month during the winter and weekly during the summer (Kinney, 2011). Additionally, a 21-acre marshalling yard is located near the dock.

The Valdez Marine Terminal, operated by Alyeska Pipeline Service Company, is across Valdez Arm from the Port of Valdez. The Valdez Marine Terminal is at the southern terminus for TAPS, and crude oil is loaded onto tankers for shipment to markets. The Valdez Marine Terminal provides four deep-draft berths for the shipment of crude oil.

Port of Whittier

The Port of Whittier is an ice-free, deepwater port located on Prince William Sound. The port is connected by highway to Anchorage and is served by the ARRC. The freight dock currently serves roll-on/roll-off style barges and has a side ramp for container offloading from barges. The port is the ARRC's freight interchange point for its rail barge service connecting Alaska with the contiguous U.S. and Canada. The port imports freight from Seattle on rail barges operated by Alaska Marine Lines, and it also services calls from the Canadian National Railway Company's rail barge from Prince Rupert, British Columbia. In addition, Alaska Marine Lines and Northland Services make calls for their container operations. A passenger ship terminal in the port is used by cruise vessels in the summer months (Moffatt & Nichol, 2014).

Port MacKenzie

Port MacKenzie is a sub-regional port located at the head of Cook Inlet across from the Municipality of Anchorage. The port is owned and operated by the Matanuska-Susitna Borough. Port MacKenzie currently contains a 1,200-foot deep-draft dock and 500-foot barge dock. Infrastructure is available to handle loading of bulk commodities. Fourteen square miles of industrial uplands are available for development. A 32-mile spur line, scheduled to be completed in 2016, will connect the port to the ARRC's rail system near Willow (Moffatt & Nichol, 2014).

Port of Dutch Harbor

Dutch Harbor is the name and location of the City of Unalaska's port. Unalaska's Department of Ports and Harbors operates several marine facilities at the port, including the Unalaska Marine Center and Light Cargo Dock. The Unalaska Marine Center is a regional container facility with approximately 2,051 linear feet of dock space; Horizon Lines operates both a 30-ton and 40-ton crane on rail system for containerized cargo at the facility (City of Unalaska, 2014). The Light Cargo Dock serves as an

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alternative off-loading site. A number of other private docks are located in the port and provide services for vessels operating in the region. Common carrier tug and barge companies offer regularly scheduled barge service between the port, Seattle, and Anchorage. American President Lines has a separate containership dock and provides service to Asian ports from Dutch Harbor.

Prudhoe Bay West Dock

The West Dock located on the western shore of Prudhoe Bay was constructed to support the transport of oil field supplies and equipment to the Prudhoe Bay area as expanding or new oil and gas industrial facilities require. The West Dock is not a traditional port, but a 13,000-foot long, gravel causeway used to off-load cargo transported to Prudhoe Bay via barge. There are two unloading facilities off the causeway: one facility is 4,500 feet from shore and has a draft of 4 to 6 feet, and the second facility is about 8,000 feet from shore and has a draft of 8 to 10 feet. Because this is not a deepwater port, cargo ships and oceangoing barges are typically offloaded to shallow-draft or medium-draft barges for lightering to shore. Arrival and off-loading are affected by sea ice, with the ice-free window occurring generally from late July through early September. A 45-foot wide haul road exists to move materials and equipment off the causeway to specific industrial facilities in the Prudhoe Bay area (U.S. Department of the Interior, 2012).

5.3.6.4 Air Transportation

Air transportation is crucial for the movement of workers, supplies, and equipment destined to remote areas of Alaska because of the large distances between cities and the limited highway and railroad infrastructure. The number of Alaska airports and airstrips that could potentially be affected by Project-related transportation needs will be confirmed later. Table 5.3.6-6 provides an overview of the characteristics of the airports in the AOI. Most of the facilities are owned and maintained by the State of Alaska and are available for public use except for Franklin Bluffs Airstrip, Dietrich Airport, and Old Man Camp Airfield, which were built to support the construction of TAPS and are not listed on current U.S. Federal Aviation Administration sectional charts; Happy Valley Airstrip, an unmaintained runway intended for emergency purposes; and Five Mile Airport, a private airport used by BP Exploration Alaska, Inc.

The airports vary widely in runway characteristics and capacity. The airports in Anchorage and Fairbanks are international airports with long asphalt runways and a large number of annual flight operations per year. The two airports provide multiple types of operations, but the primary type of operation at each airport is different. Ted Stevens Anchorage International Airport is by far the state's largest hub for passenger and cargo air traffic. Nearly five million passengers traveled through the airport in 2012, and it is among the highest ranked airports in the world for cargo throughput (Alaska Department of Transportation and Public Facilities, 2014).

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TABLE 5.3.6-6

General Characteristics of Air Transportation in the Area of Interest

Airport, Airfields, and Heliports	Area	Gravel/ Asphalt	Maximum Runway Length (ft)	Average Operations per Year	Primary Operation Type (% of total flights)	Volume of Segment Commercial Air Traffic		Distance from the Alaska LNG Project Area (miles)
						Number of Passengers (Year)	Pounds of Cargo (Year)	
Deadhorse Airfield	North Slope Borough	Asphalt	6,500	32,850	Commercial (49%)			
Franklin Bluffs Airstrip	North Slope Borough	—	—	—	—			
Galbraith Lake Airport	North Slope Borough	Gravel	5,182	348	Air taxi (50%)			
Happy Valley Airstrip	North Slope Borough	—	—	—	—			
Chandalar Airfield	Yukon- Koyukuk census area	Gravel	3,000	300	Transient, local, air taxi (33% each)			
Coldfoot Airfield	Yukon- Koyukuk census area	Gravel	4,000	996	Air taxi (80%)			
Dietrich Airport	Yukon- Koyukuk census area	—	—	—	—			
Five Mile Airport	Yukon- Koyukuk census area	Gravel	2,700	200	Transient (100%)			
Livengood Airfield	Yukon- Koyukuk census area	Gravel	1,420	100	Air taxi (100%)			
Old Man Camp Airfield	Yukon- Koyukuk census area	—	—	—	—			
Fairbanks International Airport	Fairbanks North Star Borough	Asphalt	11,800	119,720	Air taxi (31%)			
Anchorage International Airport	Anchorage Municipality	Asphalt	12,400	264,260	Commercial (38%)			
Kenai Municipal Airport	Kenai Peninsula Borough	Asphalt	7,830	39,055	Air taxi (58%)			

Source: AirNav.com (2015); Federal Aviation Administration (2015); U.S. Department of Transportation (2014)

Notes: An “—” indicates that the measure is unavailable.

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5.4 POTENTIAL CONSTRUCTION AND OPERATIONAL IMPACTS AND MITIGATION MEASURES

This section describes the potential direct and indirect socioeconomic impacts of the Project. The direct socioeconomic impacts of the Project are assessed in terms of changes in demographic, economic, and fiscal indicators in the area of interest directly caused by development, construction and operation of the Project. Table 5.4.4-1 summarizes the indicators by which direct impacts would be assessed.

TABLE 5.4.1-1 Direct Socioeconomic Impact Categories and Indicators	
Direct Impacts	Indicators
Demographics	Number of workers temporarily/permanently relocating and duration of stay
	Number of workers commuting daily to site from outside project area
Economy	Changes in unemployment rate
	Changes in employment and income levels
	Dollar value of payroll and materials purchases affecting local economy
	Revenues to be received by state and affected municipalities
	Economic value of removal of agricultural/pasture/timber land
	Changes in cost of living/inflationary effects
Housing	Effect of worker immigration on availability of housing
	Potential for competing demand for housing
Infrastructure and Services	Effect of immigration on state and municipal infrastructure and services
	Effect of Project on state and municipal infrastructure and services
Transportation	Effect of movement of equipment/materials/workers on roads, railroad system, ports and harbors, airports
	Effect of Project on other transportation users

The indirect impacts of the Project would include changes in more general socioeconomic indicators (i.e., population, employment, income, and government revenues and expenditures) resulting from indirect activities, which would occur only because of and after each of the phases of the Project. The multiplier effects of in-state spending that result from the Project are considered indirect effects; these are the additional economic effects (i.e., jobs and income) generated by the infusion of money into the local economy from Project payments to local business and local workers. Project-related revenues to the State of Alaska and local governments would also increase the level of economic activity in the state, creating local multiplier effects.

As additional Project details become available, a subsequent draft of this Resource Report will identify site-specific impacts to socioeconomics by (1) Liquefaction Facilities and (2) the Interdependent Facilities. Included will be a discussion of proposed plans and measures, including any site-specific measures.

5.5 ENVIRONMENTAL JUSTICE

This section will evaluate and discuss the environmental effects, including human health, social, subsistence, and economic effects, of the Project on minority and low-income communities or Native American tribes. Details will be provided in a subsequent draft of this Resource Report.

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5.6 SUBSISTENCE

Subsistence information for potentially affected study communities is documented in the Draft Subsistence and Traditional Knowledge Existing Data Compilation Report (Appendix D). This report provides regional overviews for seven geographical regions and identifies subsistence information available for each potentially affected community, including subsistence use areas, harvest data, timing of subsistence activities, and spatial and temporal trends in subsistence. Data gaps are identified for the potentially affected study communities and the report denotes the research that is being conducted to fill those gaps, including ADF&G household harvest surveys through 2016 and subsistence mapping surveys through 2015.

Details will be provided in a subsequent draft of this Resource Report.

5.7 HEALTH

A Health Impact Assessment is being prepared for the Project and will include a baseline data collection report (2015) and the identification of potential impact mechanisms and effects addressing each health effects category (2016). The health effects categories are:

- Accidents and injuries;
- Exposure to potentially hazardous materials;
- Food, nutrition and subsistence;
- Infectious diseases;
- Water, sanitation;
- Non communicable diseases, chronic diseases;
- Health services infrastructure, capacity;
- Transportation linkages, linear features; and
- Socioeconomic linkages, influx, worker rotation.

Details will be provided in a subsequent draft of this Resource Report.

5.8 TRADITIONAL KNOWLEDGE

Documented sources of traditional knowledge from seven geographic regions are inventoried in the Draft Subsistence and Traditional Knowledge Existing Data Compilation Report (Appendix D). This report also provides an overview of the role of traditional knowledge in the subsistence lifestyle of each region. Data gaps for traditional knowledge documentation are identified for each region and the report denotes

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the research that is being conducted to fill those gaps, including traditional knowledge workshops through 2015. Details will be provided in a subsequent draft of this Resource Report.

5.9 CUMULATIVE IMPACTS

This section will provide an assessment of any cumulative effects on socioeconomics as a result of the Project in combination with other existing or proposed projects, including nonjurisdictional facilities. The assessment will evaluate and discuss both beneficial and adverse effects resulting the Project and other existing and proposed project. For example, another large project under construction in the AOI could increase the demand for labor resulting in wage inflation and potentially could reduce the availability of temporary housing in the AOI.

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APPENDIX A TECHNICAL MEMORANDUM, GEOGRAPHIC AND TEMPORAL SCOPE



GEOGRAPHIC AND TEMPORAL SCOPE

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1.0 INTRODUCTION

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LP (Applicants) plan to construct an integrated Project (the Alaska LNG Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular from the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce. Proposed Project facilities include: a 42-in diameter, 800-mi natural gas pipeline from the North Slope to a Liquefaction Facility near Nikiski. The Liquefaction Facility is comprised of an LNG Plant and marine terminal. The natural gas pipeline would include an offshore section crossing the Cook Inlet. Two pipeline study corridors across the Cook Inlet are being considered, an east pipeline corridor and a west pipeline corridor.

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2.0 GEOGRAPHIC SCOPE

2.1 INTRODUCTION

Political jurisdictions are used to describe the boundaries of the socioeconomic impact area. Use of political jurisdictions is consistent with guidelines set forth in FERC (2002), which state that the socioeconomic impact area generally comprises the municipalities or counties in which the facilities will be located or which might be affected by project construction and operation. It is also consistent with the geographic areas of analysis recommended by the CEQ (1997) for socioeconomic resources. These areas include community, metropolitan area, county, state, or country. Using political jurisdictions to define geographic boundaries facilitates the socioeconomic effects analysis because demographic and economic information reported by many data sources, including the U.S. Census Bureau, use political jurisdictions. Moreover, stakeholders and the public can easily understand familiar political boundaries (The Louis Berger Group 2002).

2.2 ALASKA POLITICAL JURISDICTIONS

Alaska is divided into boroughs rather than counties, which are the largest administrative divisions of most states. There are currently 18 boroughs in Alaska. In addition, there are 11 census areas created by dividing the state's one unorganized borough into smaller statistical areas. The census areas do not have regional local governments.

The two place-level geographic entities for which the U.S. Census Bureau publishes data are incorporated places (cities in Alaska) and census-designated places (CDPs). Incorporated places/cities are governmental entities sanctioned by the State of Alaska to perform general-purpose functions. CDPs are unincorporated places delineated by state and borough officials in Alaska and are intended to encompass all people at a given location. Cities and CDPs are mutually exclusive of each other because, by definition, a CDP represents a named, unincorporated area (Federal Register [FR] 73 [4 November 2008]: 65572-65582).

In addition, Alaska Native Village Statistical Areas (ANVSAs) reported or delineated for the 2010 U.S. Census are used to define the socioeconomic impact area. The U.S. Census Bureau states that ANVSAs are statistical geographic entities representing the residences, permanent and/or seasonal, for Alaska Natives who are members of or receive governmental services from the defining Alaska Native village (ANV), and that are located within the region and vicinity of the ANV's historic and/or traditional location. ANVSAs are intended to represent the relatively densely settled portion of each ANV and include only an area where Alaska Natives, especially members of the defining ANV, represent a substantial proportion of the population during at least one season of the year (at least three consecutive months) (FR 73 [4 November 2008]: 65572-65582).

ANVSAs are not constrained by other place-level geographic entities; that is, ANVSAs may or may not overlap cities and CDPs (FR 73 [4 November 2008]: 65572-65582). A comparison based on 2010 U.S. Census demographic data indicates that some ANSVAs in the socioeconomic impact area have populations that differ from those of the cities or CDPs with the same name. These ANSVAs are listed separately in the description of the socioeconomic impact area in order to distinguish them from the corresponding cities or CDPs.

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2.3 SOCIOECONOMIC IMPACT AREA

2.3.1 In-state Area

Proper specification of the socioeconomic impact area is important because the type, intensity, and duration of socioeconomic effects may vary depending on the geographical area of focus. For the purposes of the socioeconomic analysis, the region encompassing the boroughs and census areas in which the Project components and major Project transportation routes are located is referred to as the “area of interest” (AOI) for the Project. The AOI, together with the state as a whole, comprise the socioeconomics study area.

As shown in Figure 2-1, the Project’s Mainline will pass through the Kenai Peninsula Borough, Matanuska-Susitna Borough, Denali Borough, Fairbanks North Star Borough, Yukon-Koyukuk Census Area, and North Slope Borough. The Gas Treatment Plant (GTP) will be located in the North Slope Borough, and the Liquefaction Facility will be located in the Kenai Peninsula Borough. Many of the direct socioeconomic effects of the Project would occur in the communities located in the pipeline corridor or in proximity to the GTP or Liquefaction Facility, and would result from the number of local and non-local construction workers who would work on the Project; their income and local expenditures; and their impact on traffic flow, population, housing, and public services.

Other potential direct effects to pipeline corridor communities are related to operation of the Project, such as impacts on the local economy, including increased revenue; increased job opportunities and income; and ongoing local expenditures by the GTP, Liquefaction Facility, and Gas Pipeline.

Direct effects during the construction phase of the Project would also occur in communities outside the pipeline corridor due to materials and equipment that would move to Project construction sites through Alaska ports and airports and along the state’s highway and railway systems. As in the pipeline corridor, transportation effects would be related to increased traffic or disruption of normal traffic patterns. These transportation effects would be concentrated in specific communities in the North Slope Borough, Yukon-Koyukuk Census Area, Fairbanks North Star Borough, Southeast Fairbanks Census Area, Valdez-Cordova Census Area, Denali Borough, Matanuska-Susitna Borough, Kenai Peninsula Borough, and Municipality of Anchorage.

Given the scale of the Project and its potential importance to the Alaska economy, the direct socioeconomic effects of the Project would also be experienced throughout the state. These statewide effects would include employment and fiscal effects. For example, a wide range of occupations are needed to construct and operate a natural gas pipeline, and it is likely that workers in all regions of Alaska would benefit from the additional employment opportunities created by the Project (Rae 2009).

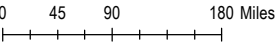
ALASKA BOROUGH AND CENSUS AREAS

FIGURE 2-1

Alaska LNG

LEGEND

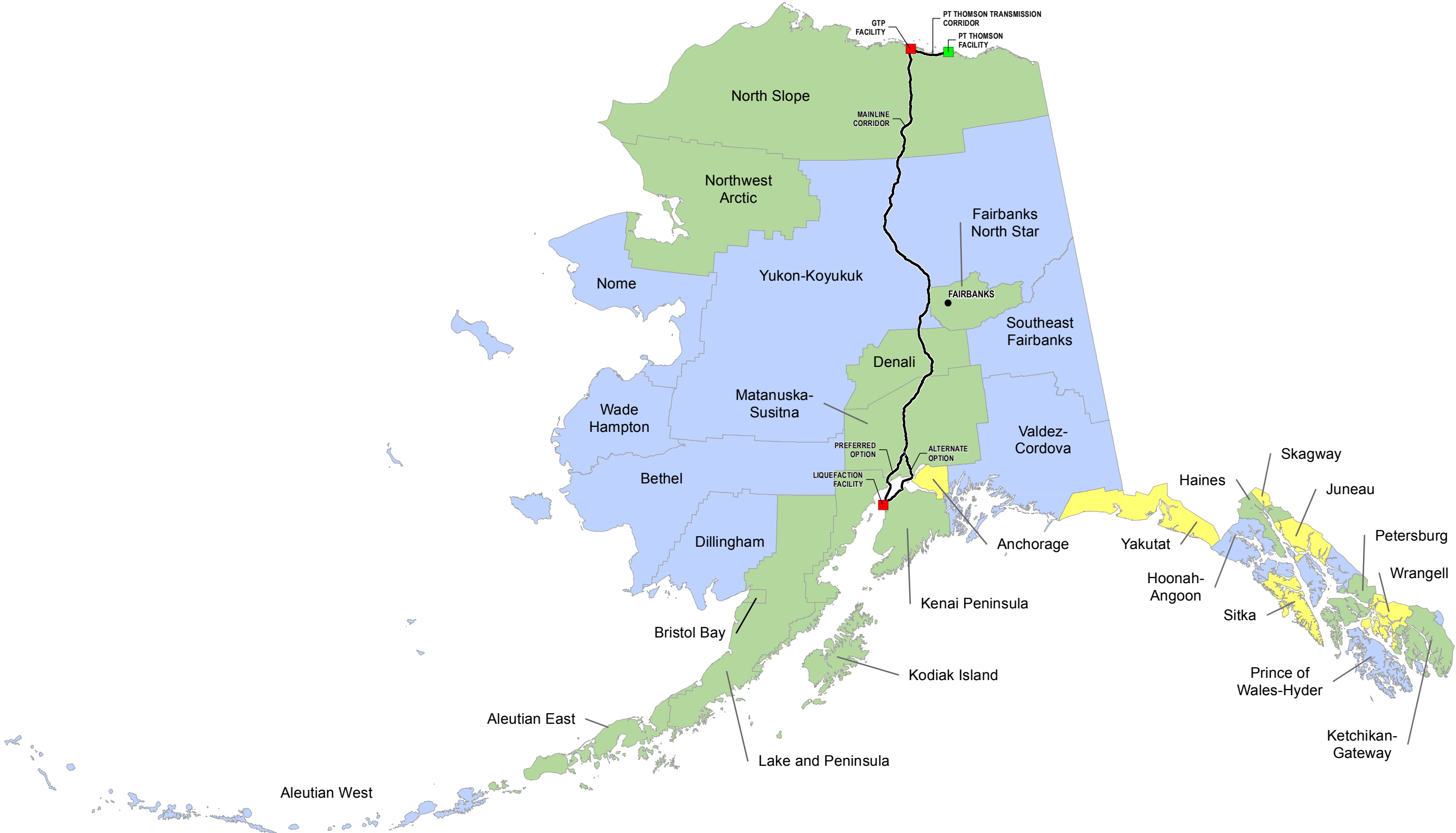
- Project Facility
- Existing Facility
- Alaska Place Names
- Project Corridor
- Borough
- City and Borough
- Census Area



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In addition, Alaska likely would experience indirect socioeconomic effects from the construction and operation of the Project¹. During the operations phase, the Project would provide a long-term source of revenue to Alaska state and local governments. This additional revenue would help support education, health facilities, and other public infrastructure and services in communities throughout Alaska. Indirect effects on population and economic growth are likely to be concentrated in Alaska's population and commercial centers, including Anchorage and neighboring communities in the Matanuska-Susitna and Kenai Peninsula Boroughs, and Fairbanks. Further, the opportunity created by the Project to take North Slope natural gas resources to market could result in additional exploration activity for gas reserves on the North Slope. To some extent this activity would lead to increased population, employment, and economic development in the state as a whole; however, the growth-inducing effects would likely be concentrated in North Slope Borough communities.

A key benefit of the Project is the provision of a steady source of natural gas for in-state use. The provision for off-take points allows for the opportunity to deliver natural gas to areas in Alaska that currently do not have access to this energy source, as well as increase and diversify the supply to areas that do. This gas potentially could be used for commercial, industrial, and residential heating needs, as well as for additional electric generation (Northern Economics, 2010).

2.3.2 Potentially Affected Communities

A potentially affected community (PAC) is defined as a city, CDP, or ANVSA in the AOI where project-related socioeconomic impacts may reasonably be expected to occur. Not all PACs experience socioeconomic impacts of the same intensity, but it is still important to identify all communities that may possibly be affected. For the purpose of defining the socioeconomic impact area, a city, CDP, or ANVSA is considered a PAC based on one or more of the following four factors:

- Whether the city, CDP, or ANVSA is the site of any major project infrastructure such as the Mainline, the GTP, the Liquefaction Facility, a work camp, a compressor station, or a storage yard;
- Whether the city, CDP, or ANVSA is located near a transportation corridor, including a port, highway, airport, or railway used to transport project materials, equipment, or workers;
- Whether the city, CDP, or ANVSA is a major logistical and supply center for Alaska's oil and gas industry; or
- Whether the city, CDP, or ANVSA could experience indirect socioeconomic effects such as growth-related impacts due to changes in population, employment, and economic development.

Table 2-1 presents an initial list of PACs based on the above criteria. PACs have been grouped together to reflect their geographic locations. The location of Project components may differ across alternatives considered; consequently, the geographical boundaries for the socioeconomic

¹ NERA Economic Consulting, "Socio-Economic Impact Analysis of Alaska LNG Project"

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effects analysis may also change with the different alternatives. In particular, alternative routes have been proposed for the Mainline and for the transport of materials and equipment during Project construction. Table 2-1 includes the PACs for all alternative routes.

Table 2-1. Alaska Boroughs, Census Areas, Cities, Census-Designated Places, and Alaska Native Village Statistical Areas in the Socioeconomic Impact Area^a

Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Non-Jurisdictional Facilities
North Slope Borough					PTU modifications/ new facilities
Anaktuvuk Pass				X	
Atkasuk				X	
Barrow				X	
Kaktovik				X	
Nuiqsut				X	
Point Hope				X	
Point Lay				X	
Prudhoe Bay	GTP	port/airport	X	X	Prudhoe Bay Unit modifications/ new facilities
Wainwright				X	
Yukon-Koyukuk Census Area					
Coldfoot	camp, compressor station	Dalton Hwy/airport			
Livengood	camp	Dalton Hwy/airport			
Manley Hot Springs		Dalton Hwy			
Minto		Dalton Hwy			
Nenana	Mainline	Parks Hwy			
Wiseman	Mainline	Dalton Hwy			
Fairbanks North Star Borough					
Fairbanks		Parks Hwy/ Richardson Hwy/Steese Hwy/airport/ railway	X	X	

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Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Non-Jurisdictional Facilities
Denali Borough					
Anderson		Parks Hwy			
Cantwell		Parks Hwy			
Healy	Mainline	Parks Hwy			
McKinley Park	Mainline	Parks Hwy			
Matanuska-Susitna Borough					
Big Lake	Mainline	Parks Hwy			
Houston	Mainline	Parks Hwy			
Knik-Fairview		Knik–Goose Bay Rd			
Palmer		Parks Highway			
Point MacKenzie	Mainline	Knik–Goose Bay Road/port/railway			
Skwentna	Mainline				
Talkeetna	Mainline	Parks Hwy			
Trapper Creek	Mainline	Parks Hwy			
Wasilla	Mainline	Parks Hwy			
Willow	Mainline	Parks Hwy			
Kenai Peninsula Borough					
Cooper Landing		Sterling Hwy			
Kenai		Kenai Spur Hwy			
Moose Pass		Seward Hwy			
Nikiski	Liquefaction Facility	Kenai Spur Hwy	X	X	Kenai Spur Highway relocation
Salamatof		Kenai Spur Hwy			
Seward		Seward Hwy/port/railway			
Soldotna		Sterling Hwy			
Sterling		Sterling Hwy			
Tyonek	Mainline				
Municipality of Anchorage					
Anchorage		Glenn Hwy/Seward Hwy/port/airport /railway	X	X	

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Area	Project Facility	Transportation Corridor	Logistical/ Supply Center for Oil and Gas Industry	Growth-Related Effects	Non-Jurisdictional Facilities
Eklutna ANVSA		Glenn Hwy			
Southeast Fairbanks Census Area					
Big Delta		Richardson Hwy			
Delta Junction		Richardson Hwy			
Valdez-Cordova Census Area					
Copper Center		Richardson Hwy			
Copper Center ANVSA		Richardson Hwy			
Gakona		Richardson Hwy			
Gakona ANVSA		Richardson Hwy			
Glennallen		Richardson Hwy			
Gulkana		Richardson Hwy			
Gulkana ANVSA		Richardson Hwy			
Paxson		Richardson Hwy			
Tazlina		Richardson Hwy			
Tazlina ANVSA		Richardson Hwy			
Tonsina		Richardson Hwy			
Valdez		Richardson Hwy/port			
Whittier		port/railway			
Other - City of Unalaska		port			

^a A city/CDP and the corresponding ANVSA are listed separately only if the populations of the two geographical units differ.

2.3.3 Out-of-State Area

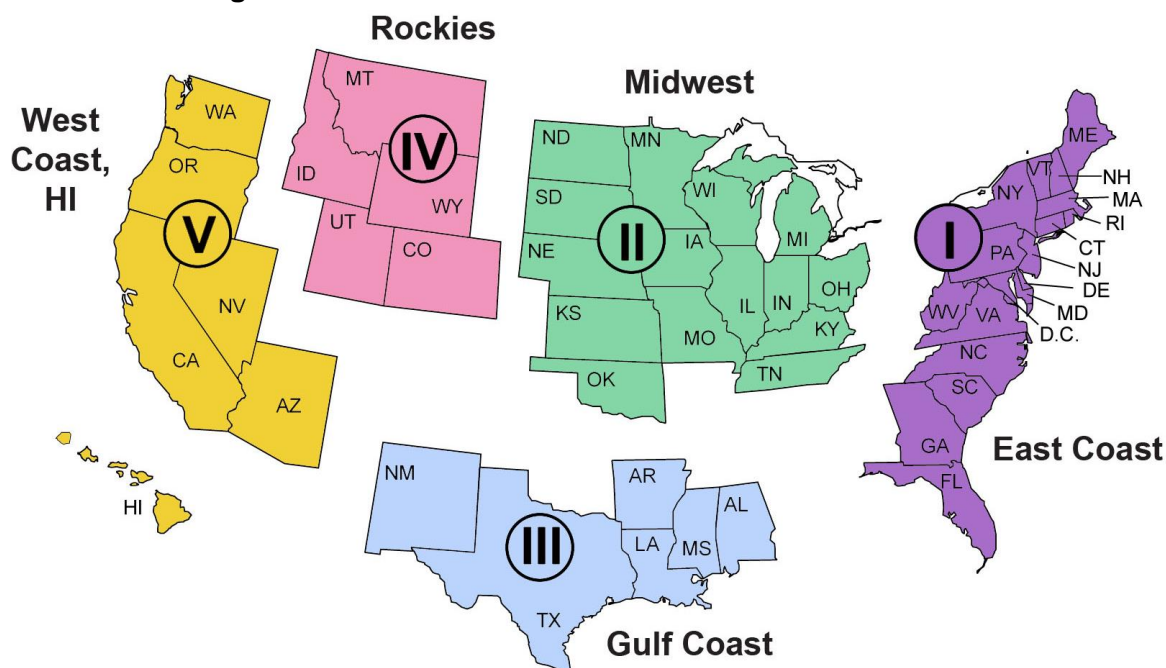
Alaska's oil and gas industry is projected to experience an employment gap over the next few years (Alaska Department of Labor and Workforce Development 2014a), and the Project would widen that gap. For example, the State of Alaska estimates that the number of workers required

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for construction of a major natural gas pipeline would be greater than what the Alaska workforce can provide (Alaska Department of Revenue 2006). Some of the jobs may need to be filled by out-of-state workers, most of whom reside in the contiguous U.S. In addition to employment effects, construction of the Project would require materials, supplies, and equipment from the rest of the U.S. and other countries.

There would be differences across states in the percent of materials, supplies, equipment, and labor provided toward construction of the Project. Many of these variances would be regional in nature rather than state-specific. Therefore, it is appropriate to model these national effects on a regional basis. After review of various regional aggregations, the Energy Information Administration's five Petroleum Administration for Defense Districts (PADDs) were selected for discussing the out-of-state socioeconomic effects of the Project (Figure 2-2).

Figure 2-2. Petroleum Administration for Defense Districts



Source: Energy Information Administration (2011).

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3.0 TEMPORAL SCOPE

Defining the temporal scope for the socioeconomic effects analysis is based upon the duration of the effects of the proposed action and alternatives. It is the duration of the effects of the action that is relevant, not the duration of the action itself (U.S. Department of the Interior, 2010). The socioeconomic effects analysis covers the development, construction and operations phases of the Project recognizing that there is overlap between these phases.

3.1 DEVELOPMENT PHASE

The term “development” as used here includes all procurement and pre-construction activities such as design and engineering, permitting, surveying, field studies, and other activities that would take place prior to full funding of the Project. This phase would extend from 2014 through 2021.

3.2 CONSTRUCTION PHASE

The construction phase would extend from 2019 with early construction work, to the end of post-construction activities (e.g., equipment demobilization) in 2026 or 2027.

3.3 OPERATIONS PHASE

First gas is projected for 2025, with full gas in 2026. TAPS was originally authorized to operate for 30 years. Assuming a similar period for the Project would suggest that the temporal period for the operations phase would extend to 2055. The REMI model extends economic and demographic forecasts through 2060, which is consistent with the timeframe of the temporal scope of the socioeconomic analysis.

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4.0 SUMMARY

A potentially affected community (PAC) is defined as a city, CDP, or ANVSA in the AOI where project-related socioeconomic impacts may reasonably be expected to occur. Not all PACs experience socioeconomic impacts of the same intensity, but it is still important to identify all communities that may possibly be affected. For the purpose of defining the socioeconomic impact area, a city, CDP, or ANVSA is considered a PAC based on one or more of the following four factors:

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- Whether the city, CDP, or ANVSA is located near a transportation corridor, including a port, highway, airport, or railway used to transport project materials, equipment, or workers;
- Whether the city, CDP, or ANVSA is a major logistical and supply center for Alaska's oil and gas industry; or
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Table 2-1 presents an initial list of PACs based on the above criteria. PACs have been grouped together to reflect their geographic locations. The location of Project components may differ across alternatives considered; consequently, the geographical boundaries for the socioeconomic effects analysis may also change with the different alternatives. In particular, alternative routes have been proposed for the Mainline and for the transport of materials and equipment during Project construction. Table 2-1 includes the PACs for all alternative routes.

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5.0 ACRONYMS AND ABBREVIATIONS

§	Section
ANV	Alaska Native village
ANVSA	Alaska Native Village Statistical Area
APP	Alaska Pipeline Project
CDP	Census-Designated Place
CEQ	Council on Environmental Quality
FERC	Federal Energy Regulatory Commission
FR	Federal Register
GTP	Gas Treatment Plant
LNG	Liquefied Natural Gas
REMI	Regional Economic Models, Inc.
TAPS	Trans-Alaska Pipeline System

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APPENDIX B TECHNICAL MEMORANDUM, HISTORICAL OVERVIEW OF THE ALASKA ECONOMY

Alaska LNG

Historical Overview

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ACRONYMS AND ABBREVIATIONS

AGIA	Alaska Gasline Inducement Act
ANCSA	Alaska Native Claims Settlement Act
APSC	Alyeska Pipeline Service Company
CBRF	Constitutional Budget Reserve Fund
CDQ	Community Development Quota
FERC	Federal Energy Regulatory Commission
FPC	Federal Power Commission
LNG	Liquefied natural gas
PFD	Permanent Fund dividend
SGDA	Stranded Gas Development Act
TAPS	Trans-Alaska Pipeline System
tcf	Trillion cubic feet
U.S.	United States

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1.0 INTRODUCTION

This technical memorandum offers a historical overview of Alaska's economy. The intent of the memorandum is to increase understanding of the dynamics of the state's economy and describe how Alaska's economic structure differs from that of other states. The memorandum is organized as follows:

- Section 2 provides a socioeconomic snapshot of the state in 1970, shortly before the development of oil resources on Alaska's North Slope. Key demographic and economic characteristics of the state at that time are compared to those of the rest of the United States (U.S.). The section concludes with a description of land ownership in Alaska in 1970, as it has an important influence on the economic events that follow.
- Section 3 reviews the socioeconomic effects of the construction phase of the Trans-Alaska Pipeline System (TAPS) during the mid-1970s. Included in this discussion are the impacts of TAPS construction activities on population, employment and income, the cost of living, and the social environment.
- Section 4 describes the major socioeconomic developments in Alaska following the start of North Slope oil production. The section begins with the spurt in economic growth resulting from the increase in oil-related state revenues. The focus then shifts to longer trends in the state's major economic drivers, including the petroleum industry and federal government. In addition, the post-TAPS discussion examines trends in 1) demographics; 2) the role of miscellaneous economic sectors; 3) the cost of living; and 4) the economy of rural Alaska, particularly as it relates to economic changes experienced by Alaska Natives.
- Section 5 summarizes socioeconomic differences and similarities between Alaska in 1970 and Alaska four decades later in 2010. The section also compares selected socioeconomic characteristics of Alaska and the U.S. as a whole. The year 2010 was selected as the end date for the analysis because it is consistent with a four-decade-long overview and because it is the most recent year for which there is a temporally consistent dataset.
- The proposed Alaska LNG Project has its own historical context in several proposed projects, which, unlike the Alaska LNG Project, were solely focused on building pipelines to transport Alaska's North Slope gas to market. .

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2.0 ALASKA'S ECONOMY BEFORE THE TRANS-ALASKA PIPELINE SYSTEM

Prior to becoming a state in 1959, Alaska's economic history was one of periodic booms associated with large-scale exploitation of a succession of natural resources — including furs, gold, fish, and timber — followed by busts when the resource became depleted or market conditions turned against continued production (Goldsmith 2010a). The economic booms generated considerable wealth, but most of it went to outside companies that had the capital to successfully explore, develop, and produce Alaska's natural resources, and little was left behind to benefit Alaskans, or to build a stable and permanent economic base (Goldsmith 2010a).¹

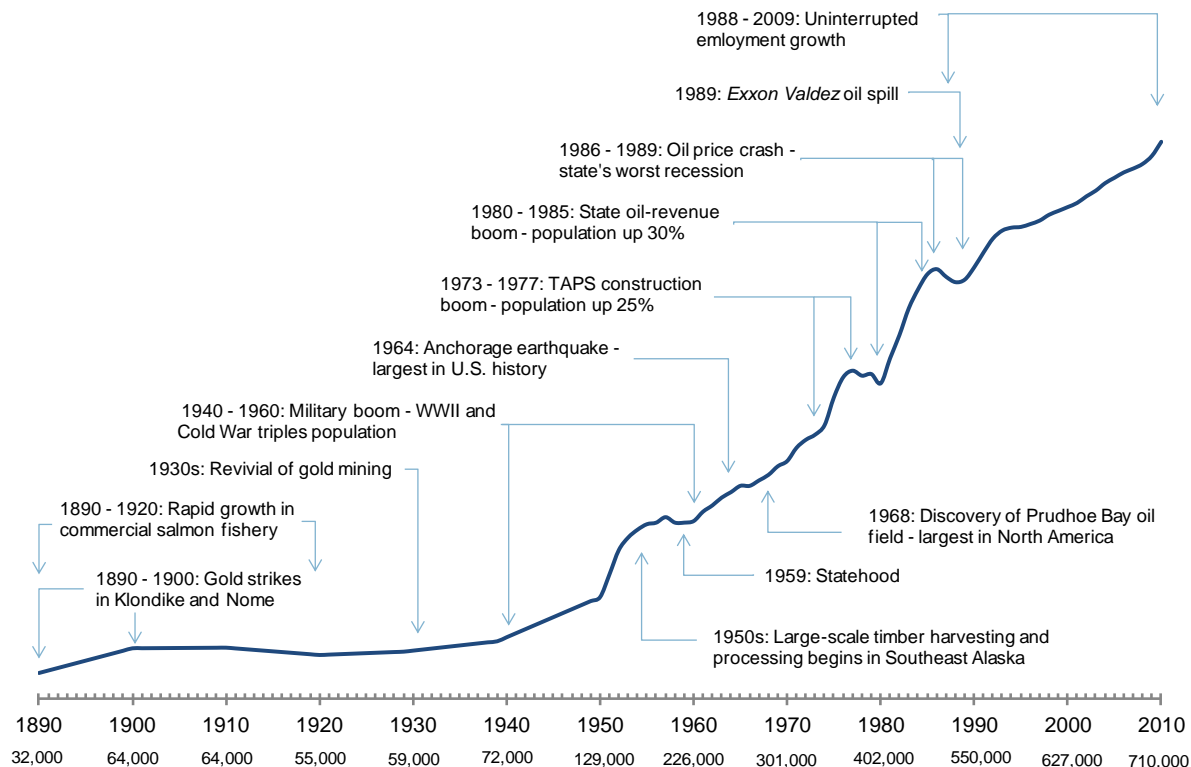
In addition, the federal government exerted considerable control over the territory's economy. At statehood, about 80 percent of jobs in Alaska depended directly or indirectly on federal spending (Goldsmith 2008b). The U.S. military accounted for most of the federal expenditures in Alaska, which General Billy Mitchell called "the most important strategic place in the world" because of its proximity to Europe and Asia (Goldsmith 2003; Leask et al. 2006). The military had maintained a presence in Alaska since the United States purchased it from Russia in 1867 (U.S Army Alaska), but it was World War II and the arrival of military troops in Anchorage in 1940 (Fried and Windisch-Cole 2006) that marked the beginning of a dramatic economic and population expansion that would last through the 1950s (Figure 2-1). After World War II, there were fears that demobilization would result in a bust for Anchorage's economy, but the Korean War and Cold War pushed troop levels up (Fried and Windisch-Cole 2006). Toward the end of the 1950s, the relative economic importance of the military in Alaska began to wane, but with 33,000 military personnel stationed there in 1960, the U.S. Department of Defense continued to be the largest single employer (Leask et al. 2006).

¹ Alaska's early commercial salmon fishery illustrates the state's boom-and-bust cycle. By the 1920s, a tax on each case of salmon packed in the territory accounted for 70 percent of general fund revenue (Fried 1996). During the early 1940s, salmon harvest levels reached a record high of over 100 million salmon caught annually (Heard 2003). By 1948, however, revenues from fishing had dropped so dramatically that alcohol taxes had become Alaska's main source of revenue (Alaska Department of Revenue 2011).

With respect to the lack of local investment capital, Kaufman (1961) notes that total aggregate capital, surplus, undivided profits, and reserves for all 18 Alaskan banks in 1960 were the smallest of any state. Nevada, the state with the next smallest population, had more than twice the amount, and the newest state, Hawaii, had four times the amount.

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Figure 2-1. Alaska's Population, 1890 to 2010



Source: Adapted from Leask et al. (2001). Additional data from Alaska Department of Labor and Workforce Development, Research & Analysis Division (2011).

Through the 1960s, Alaska retained an immature, frontier economy; immature because it did not provide the full range of economic goods and services, and frontier because it had relatively high natural resource levels, but the resources were located in remote, sparsely populated regions of the state (Huskey 1982). These two attributes were interrelated. The low population density and underdeveloped character of the state weakened the links between resource development and support sector and population growth. Resource development typically depended on non-resident workers and imported goods and services (Huskey 1982). Because this “enclave” resource development involved limited direct interaction with the regional economy in which it operated, Alaska only marginally benefited from the direct jobs and business activity associated with the development. Furthermore, the economy missed out on the larger multiplier effect that would be generated by these activities if they occurred in a more developed economic setting (Goldsmith 2010b).² High transportation costs made living in the state more expensive than the national

² The multiplier effect describes how an increase in economic activity starts a chain reaction that generates more activity than the original increase. For example, the sale of Alaska’s natural resources draws money into the state that generates revenues for businesses, wages and jobs for Alaskans, and other income. As Alaska businesses and households spend this new money within the state, additional revenues, wages, and jobs are created in other businesses (Goldsmith 2010b).

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average, but the higher prices of consumer goods and housing were at least partially offset by higher wages and income. The following quote (quote from Kaufman 1961) captures the effect of these various factors on the character of the economy's growth:

It seems to me that the extra expense, and most of the difficulties of doing business in Alaska go in the proverbial vicious circle. The high cost of doing anything in Alaska is caused mostly by high-priced labor. The high wages are caused by the high cost of living, this is due to the high cost of transportation, transportation is high mostly because of one-way freight and not enough of it to interest much competition. The small amount of freight is due to Alaska's small permanent population, which is due to the lack of basic industrial growth, which is due to the high cost of doing anything in Alaska.

2.1 SOCIOECONOMIC OVERVIEW OF ALASKA IN 1970

This section examines Alaska's early demography and economy in more quantitative terms. Table 2-1 compares selected socioeconomic characteristics of Alaska in 1970 with those of the rest of the U.S. Socioeconomic differences and similarities between Alaska in 1970 and contemporary Alaska are examined in Section 5.0.

As shown in the top portion of Table 2-1, Alaska's population in 1970 was only 308,500, the lowest of any state, and disproportionately male. More men than women came to Alaska for the chance at high-paying but often temporary jobs (Leask et al. 2001). The state had a large indigenous (Alaska Native) population, who primarily lived in rural areas of the state.³ The median age in the state was 22.9 years, which made Alaska's population by far the most youthful of all the U.S. states. Much of Alaska's population had moved to the state within the previous five years. This occurred both because Alaska was growing quickly and because the large military population added to the high population turnover (Leask et al. 2001). Few non-Natives were born and raised in Alaska, and few people retired in the state, which tended to keep the population young (Leask et al. 2001). Finally, Alaska wages and income were substantially above national averages.

³ Alaska Natives include the Iñupiaq, Unangam Aleuts, Yup'ik, St. Lawrence Island Yup'ik, Cup'ik, Sugpiat, Eyak, Tlingit, Haida, Tsimshian, and eleven Athabaskan cultures.

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Table 2-1. Demographic and Economic Characteristics of Alaska and the United States, 1970

Socioeconomic Characteristic			Alaska		United States	
Population (000s)			308.5		205,052.2	
Male population (%)			54.3		48.6	
Alaska Native/American Indian population (%)			17.0		0.4	
Median age of population			22.9		28.1	
Population that moved from another state within the last five years (%)			44.0		18.5	
Total (non-farm) employment (000s)			93.1		71,006.0	
Average hourly wage for production workers (\$)			4.66		3.36	
Annual income per capita (\$)			5,248		4,084	
	Gross Product		Employment		Earnings	
	(Percent of Total)					
Industry	Alaska	United States	Alaska	United States	Alaska	United States
Mining (excluding oil and gas extraction)	0.3	0.7	2.2	0.5	3.8	0.6
Oil and gas extraction	14.2	1.2	N/A	0.4	N/A	0.5
Construction	9.6	5.0	5.6	5.0	11.2	6.6
Manufacturing	5.8	24.4	5.5	22.5	6.6	27.2
Trade	10.4	17.2	12.3	20.5	11.4	17.2
Transportation and warehousing	9.5	8.8	6.6	5.6	8.8	7.4
Finance, insurance, and real estate	10.0	14.4	3.8	7.0	2.7	5.4
Professional, scientific, and technical services	5.9	8.7	11.1	15.7	8.3	11.6
Health care and social assistance	1.7	3.3	1.6	3.8	1.9	4.4
Government and government enterprises	30.7	13.7	48.3	18.4	43.1	18.6
Other sectors	1.9	2.6	3.0	0.6	2.2	0.5

Source: Adapted from Carrington (1996). Additional data from U.S. Department of Commerce, Bureau of Economic Analysis (2013a) and U.S. Census Bureau (2011b).

The rest of Table 2-1 compares the structure of Alaska's economy in 1970 with that of the rest of the U.S. Since no single economic measure captures the importance of Alaska's economic sectors, gross product (a measure of the total value of output), employment, and earnings are used to characterize and measure the importance of each sector. Alaska's economic structure exhibited two unusual features. First, the Alaskan manufacturing industry was quite small, with the only significant activity in food processing (primarily salmon canning) and lumber products. In contrast, the economic foundation of most other areas of the U.S. was the cash brought in by manufacturing and exporting goods. Second, the government sector in Alaska was very large because of the presence of several military bases. Moreover, federal grants covered more than half the state budget. The state's own modest revenues came from various charges and taxes — including taxes on personal income and commercial fish — and from oil and gas production in Cook Inlet, which began in the 1950s (Leask et al. 2001). In 1970, annual Cook Inlet oil production

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peaked at 82,945 million barrels and as a result, the state's oil revenues accounted for 88 percent of unrestricted general fund revenue (Alaska Department of Natural Resources 2010b; Alaska Oil and Gas Association 2010).⁴

In sum, the pre-TAPS Alaska economy was built mainly on the sale of natural resources and inflows of cash from the federal government, while the pre-TAPS population may be characterized as numerically small, youthful, new to the state, likely male, and relatively likely to be employed by the government (Carrington 1996). The relatively limited trade and service sectors, together with the large non-resident workforce, prevented more recycling of the money that entered the economy from natural resource sales and federal government expenditures. Less recycling — local purchases by businesses and households — meant less job creation (i.e., a smaller multiplier effect) (Goldsmith 2010b).

2.2 LAND OWNERSHIP IN PRE- TRANS-ALASKA PIPELINE SYSTEM ALASKA

The issue of land ownership is critical to an understanding of the evolution of Alaska's economy after 1970. On the eve of statehood in 1959, all but about half a percent of Alaska's 375 million acres belonged to the federal government (Hull and Leask 2000). To help provide a long-term economic base for the new state, Congress included measures in the Alaska Statehood Act that changed land ownership and management (Alaska Humanities Forum 2011a).⁵ One measure granted Alaska 90 percent of the revenues from mineral lease sales on federal lands in Alaska (225 million acres, or 60 percent of the land in Alaska was set aside as federal land). A second measure granted Alaska the right to select 104 million acres (28 percent of the land in Alaska) from lands that were not reserved for national parks, military bases, or other purposes. The federal government would transfer the title of this land to the state.

As the new state leaders began selecting Alaska's land allotment, Alaska Native groups protested many of the selections based on a provision in the Statehood Act that prohibited Alaska from claiming any right or title to land that may be subject to Alaska Native title (Alaska Humanities Forum 2011b). Alaska Native land claims had been building before statehood, particularly in Southeast Alaska (Hull and Leask 2000). In the 1960s, however, when the state began selecting lands, Alaska Native groups saw increasing threats to lands they had traditionally used, and they organized statewide to press their land claims. After several years, federal, state, and Alaska Native negotiators agreed on the general outlines of a settlement, and in 1971, Congress passed the Alaska Native Claims Settlement Act (ANCSA). ANCSA settled Alaska Native land claims with a grant of 44 million acres and a payment of \$1 billion. In addition, it established 12 Alaska-based regional corporations and more than 200 village corporations to manage that land and money.⁶

The Alaska Native corporations created under ANCSA became by far Alaska's largest private landowners, with regional and village corporations owning about 12 percent of Alaska lands. All other private landowners together owned only around one percent (Leask et al. 2001). The federal and state governments together owned approximately 87 percent of the land and a large share

⁴ By 1967, Alaska's income derived from oil and gas (as well as other mineral deposits) had surpassed federal military expenditures for the first time in Alaska's history. Oil became the chief source of state income, and fisheries moved to a distant third place (Mcbeath et al. 2008).

⁵ During the battle for statehood one of the primary arguments put forward by opponents was that Alaska would not be able to pay the bills that would accrue as a result of statehood (Kaufman 1961).

⁶ A 13th regional corporation, based in Seattle, was created to compensate Alaska Natives living outside Alaska. This regional corporation ceased operations in 2009.

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of the natural resources in Alaska. Alaska ranked (and continues to rank) number one in the nation in terms of the share of land in public ownership. Public ownership removed a large share of land from the potential property tax base, but offered the opportunity for public revenues from resource exploitation in the form of royalties and other payments (Goldsmith 2010b). As will be demonstrated in the following sections, these land distribution advantages and disadvantages would substantially shape Alaska's subsequent economic development.

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3.0 THE TRANS-ALASKA PIPELINE SYSTEM ERA

In 1968, test drilling on the North Slope confirmed the existence of the Prudhoe Bay oilfield, which happened to lie beneath some of the land selected for state ownership. The new field contained more than 25 billion barrels of oil, making it the largest in North America (BP 2006). TAPS was designed and constructed to transport Prudhoe Bay oil to the northernmost ice-free port in Valdez, for shipment out of state. With an estimated cost of construction, excluding interest, of \$7.94 billion (1977 dollars) (Government Accounting Office 1978), TAPS was the most expensive privately financed construction project up to that time. As discussed in the previous section, Alaska's economy was very small. A consequence of these two factors was the largest demand shock to a localized labor market in postwar U.S. history (Carrington 1996).

After a series of political and environmental challenges were overcome, pre-construction activities for TAPS began in the spring of 1974, and actual pipeline construction began in early 1975 (Government Accounting Office 1978). Activity and employment for TAPS tailed off substantially by the late fall of each year, since winter construction was limited to relatively few activities (Carrington 1996). Pipeline construction was completed in May 1977, and the first oil entered the line on June 20, 1977 (Government Accounting Office 1978).

The Alyeska Pipeline Service Company (APSC) was formed in 1970 by the owners of the pipeline as their common agent for designing, constructing, and operating TAPS (Government Accounting Office 1978).⁷ The company employed roughly 25,000 workers during each summer of the project, and its subcontractors employed roughly 25,000 more (Carrington 1996). APSC's original peak workforce projection was a maximum of 16,000 workers (Government Accounting Office 1978). The need to hire far more workers than expected resulted from an array of factors, including unanticipated site conditions and construction difficulties. Due largely to the additional direct labor hours required to complete the project, TAPS experienced a cost overrun of about \$1.5 billion, or 23 percent more than projected (Government Accounting Office 1978).

When construction began on TAPS, Alaska had nowhere near the number of workers needed to fill the required jobs during the two year construction phase. In fact, before construction began, there were fewer than 8,000 construction jobs in all of Alaska (Wink 2007). As shown in Table 2-1, non-farm employment for the state totalled only about 93,100. Further, although the state government required that APSC employ qualified Alaska residents whenever possible, it provided very little in the way of workforce training to assist people in obtaining pipeline jobs until fiscal year 1974-1975, when \$1.6 million was allocated; \$1.1 million from the state and about \$0.4 million from APSC (Information Insights 2004). Training did not begin until well into the second construction season. Because there was no recorded follow-up with trainees, it was impossible to determine whether or not those trained went on to get pipeline jobs (Information Insights 2004).

Since Alaska's workforce was small and relatively unskilled, the majority of jobs from the construction of TAPS went to non-Alaskans. Estimates indicate that at the peak of oil pipeline construction (December of 1975), Alaska residents made up only 41 percent of pipeline workers. However, even this low percentage may overestimate the involvement of Alaska's resident workforce, since during TAPS construction, state residency was determined by one of four

⁷ The pipeline owners were Amerada Hess Corporation, ARCO Pipeline Company, Sohio Pipeline Company, Exxon Pipeline Company, Mobil Alaska Pipeline Company, Phillips Petroleum Company, Union Alaska Pipeline Company, and BP Pipelines, Inc. (Government Accounting Office 1978).

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indicators including an intent to establish a permanent residence in Alaska, or voting or *planning* to vote in a local election, neither of which required long-term residency. As reported in Carrington (1996) Dixon (1978) estimated that approximately 40 to 60 percent of the Alyeska workforce was supposedly Alaska residents. No information was reported for the contractor workforce. Today, Alaska residency is defined as those persons that qualify for an Alaska Permanent Fund dividend (PFD), which requires that a person reside in the state for at least one year, often longer, depending on when the residency began and the time period for submittal of information for the PFD.

Many of the workers hired by APSC were career “pipeliners” who built and maintained oil pipelines throughout the world (Carrington 1996). This group included engineers and managers, but they were typically skilled welders and pipefitters. Only a few of these pipeliners were resident Alaskans, with the majority apparently coming from the pipeline industry’s bases in Texas and Oklahoma. APSC jobs typically included periodic free trips to and from the contiguous U.S. for rest and relaxation leaves. The rest of the TAPS workforce consisted of relatively low-skilled labor such as truck drivers, operators of excavation machinery, and other support staff. Many of these people also came from the contiguous U.S., but such workers were apparently much more likely to be Alaska residents (free travel for rest and relaxation leaves was not generally provided by subcontractors) (Carrington 1996).

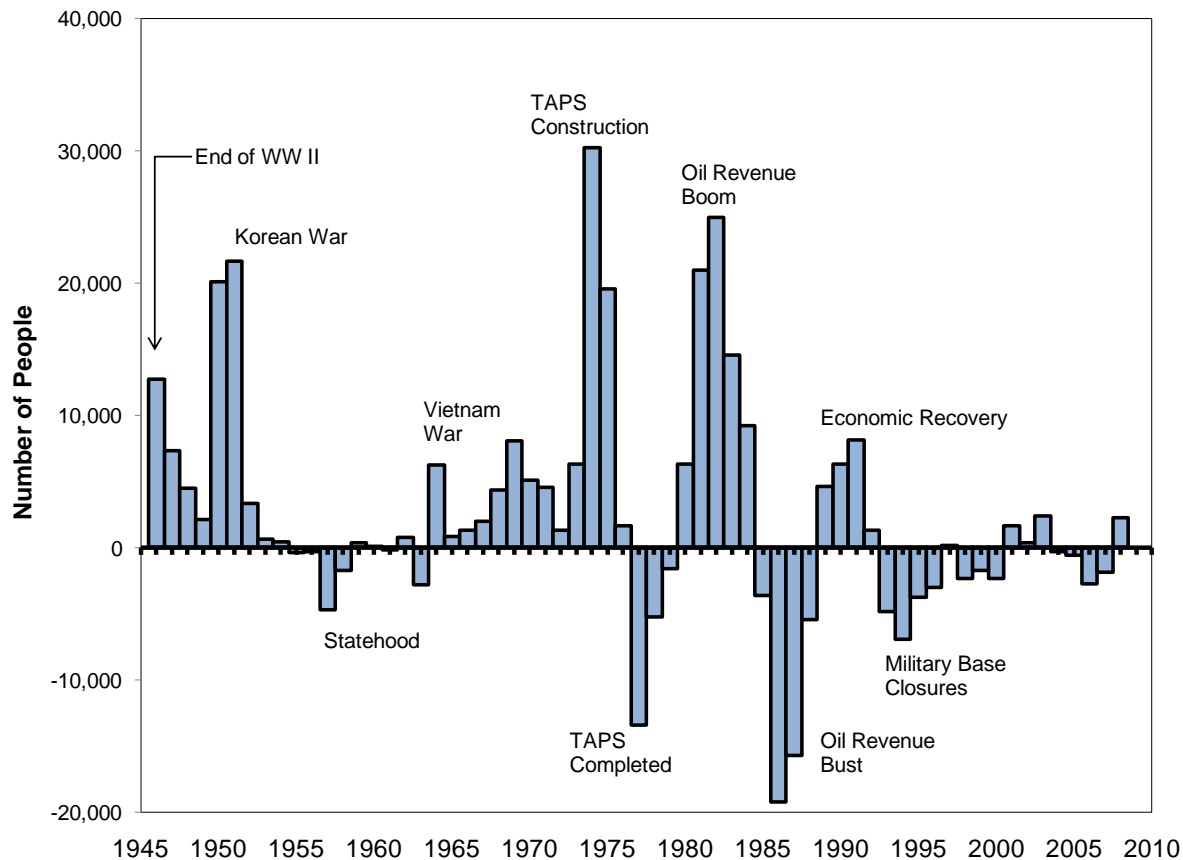
Most APSC employees were hired under an umbrella-type project labor agreement negotiated with 17 international unions in late 1973 and early 1974 (Government Accounting Office 1978). In return for generous wage and travel provisions, the unions promised not to strike for the duration of TAPS construction. Unskilled workers typically applied for APSC jobs at union halls in Anchorage or Fairbanks, while many of the skilled workers were recruited through union halls in Oklahoma and Texas (Carrington 1996).

3.1 EFFECTS OF THE TRANS-ALASKA PIPELINE SYSTEM ON THE POPULATION AND ECONOMY

3.1.1 Population

Figure 3-1 illustrates the dramatic change in Alaska net migration during the period that TAPS was built. Oil pipeline construction in itself was not the only factor fuelling population growth in Alaska in the mid-1970s. The project came at a time when a recession in much of the rest of the country made the lure of a booming Alaska economy even stronger (Fried 2009). The 1973-1975 U.S. recession, caused by the 1973 “oil price shock” that followed the Organization of Arab Petroleum Exporting Countries’ oil embargo against the U.S., together with the 1973-1974 stock market crash, was at that time the most severe economic downturn since the Great Depression of 1929. As a result of the poor economic conditions in the contiguous U.S., migration to Alaska was probably considerably higher than it would have been if TAPS had gotten underway during a period of more robust national economic growth (Information Insights 2004). One of the fears of some Alaskans was that TAPS construction would trigger a massive inflow of unemployed workers and their families coming to Alaska in search of jobs only to end up on welfare. However, these fears were never realized; most of the individuals who came to Alaska in search of work were able to find employment (Information Insights 2004).

Figure 3-1. Alaska Net Migration, 1945 to 2010



TAPS – Trans-Alaska Pipeline System.

Source: Adapted from Fried (2009). Additional data from Alaska Department of Labor and Workforce Development (2014)

3.1.2 Employment and Income

Employment in Alaska's construction industry grew from 10,438 in 1973 to 38,453 in 1976, a growth of 268 percent that underscores the extraordinary size of the TAPS employment shock (Carrington 1996). Increase in demand for construction labor led to an increase in construction wages. Some of the rise in average wage rates also reflected an upgrading of the skill level of the average worker rather than an increase in the wage accorded any given worker. As noted above, many in-migrants to Alaska's construction industry were skilled managers and operatives from the oil industry in Oklahoma and Texas, and these workers commanded higher than average wages (Carrington 1996). Nonetheless, wages were extraordinarily high even for relatively low-skill workers such as truck drivers and cooks (Carrington 1996). While the growth in construction employment from 1973 to 1976 was huge, so was the drop in employment and wages that occurred after the pipeline was finished (Carrington 1996).

There is evidence that TAPS construction also had strong positive spillovers into most sectors of Alaska's economy. The TAPS project and general economic boom increased labor demand in certain non-construction industries at the same time that it reduced labor supply (Carrington

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1996). The wholesale and retail trade, transportation, public utilities, and finance and service industries all experienced strong employment growth over this period.

The manufacturing and government sectors, however, were relatively untouched by the pipeline boom in terms of employment (Carrington 1996). As discussed in Section 2.0, Alaska's manufacturing industry during this period was small. Virtually all the materials used to construct TAPS were manufactured out-of-state. The demand for government services increased with the boost in population and economic activity, but this demand increase had little effect on the number of state and local government employees. There were, however, significant earnings increases for these employees as the state and local governments sought to retain experienced employees (Carrington 1996).

3.1.3 Unemployment

The Alaska unemployment rate fell substantially over the TAPS construction period (Carrington 1996). In Fairbanks and Anchorage, unemployment among working-age residents dropped to near zero as Alaskans left their routines to take advantage of the high wages offered by APSC and its subcontractors (Haycox 2009). Carrington (1996) offers a number of reasons why the unemployment rate for the state as a whole did not fall even more. As noted above, TAPS was started in the midst of the 1974-75 recession, when workers from the contiguous U.S. came to Alaska eagerly seeking opportunities for high-paying jobs. In addition, union contracts constrained the number of potential APSC jobs, and out-of-state workers were willing to wait in unemployment lines in Alaska until a job opened up. Some Alaska residents, especially those from the state's more rural areas, may have lacked the qualifications to successfully compete with these newcomers for TAPS construction jobs.

3.1.4 Cost of Living

Relative to the U.S. average, Anchorage consumer prices fell over 1968-73, apparently because of increasing integration of the Alaskan economy with the U.S. mainland. In contrast, Anchorage prices rose roughly five percent faster than the U.S. average over 1975 and 1976. Prices rose even more in Fairbanks where, for example, costs for food were reportedly ten percent higher in Fairbanks than in Anchorage in October of 1976, and costs for non-food items were about nine percent higher. As with the earnings and wage increases, however, the relative cost of living increase was short-lived. After TAPS construction was completed, prices quickly returned to the relative price level of 1973 and 1974 (Carrington 1996).

3.2 SOCIAL IMPACTS OF THE TRANS-ALASKA PIPELINE SYSTEM

A distinctive feature of the TAPS construction project is that it was publicized well in advance of its starting date (Carrington 1996). Legal challenges delayed the start of construction for over three years. APSC ordered \$100 million (1969 dollars) of pipe from Japanese mills in April 1969, and the pipe was completely delivered by the end of 1971 (Carrington 1996). Moreover, there was a boom in retail and office construction in Alaska in 1969 and 1970. As Fairbanks was the likely staging area of the proposed pipeline, much of the speculative building was centered there, but Anchorage also experienced a large growth in construction permits (Carrington 1996).

However, prior to the start of TAPS construction, Fairbanks, Valdez, and other Alaska communities did not plan for the needs of a project of that magnitude. The ability of municipalities to plan for impacts was limited by the absence of specific, concrete, actionable knowledge from

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industry on project plans and timelines. Moreover, state government could have assisted municipalities more by providing support and financial help for planning efforts prior to construction. During TAPS construction, the commitment of state funds for impact needs came only after the impact was demonstrated, and when it did come, impact aid was often less than anticipated (Information Insights 2004). Insufficient housing, school overcrowding, teacher shortages, inadequate roads, telephone systems, and other infrastructure, and inadequate or non-existent zoning regulations were some of the negative experiences that could have been addressed through better community planning (Information Insights 2004).

As the only urban community located within the pipeline corridor, Fairbanks was particularly affected. It received the largest number of in-migrants and was also the destination for TAPS workers on rest and relaxation leaves (Government Accounting Office 1978; Carrington 1996). Moreover, Fairbanks was positioned to serve as a service and supply center for TAPS. During peak construction, APSC estimated it spent \$800,000 per day in Fairbanks (Information Insights 2004). Anchorage, which served as a headquarters for pipeline administrators and support industries, was another urban area significantly affected. Its population increased 20 percent from 1973 to 1977, and the impact of TAPS was felt on the local economy, municipal infrastructure, education expenditure, property values, housing, transportation, utilities, and public services (Information Insights 2004).

While many of the social impacts of TAPS construction were concentrated in the urban areas of Fairbanks and Anchorage, scores of rural Alaska's communities also experienced impacts to some extent, especially workforce shortages because of the large number of local residents who left for pipeline jobs. The smaller villages felt the most severe impact, as few people were qualified to take over for essential personnel who left (Information Insights 2004). On the other hand, construction of TAPS contributed to a substantial increase in employment and income for Alaska Natives in rural Alaska. Close to 6,000 Alaska Natives, representing roughly 10 percent of the total workforce, were hired during construction (Martin and Hill 2009).

3.3 LONG-TERM ECONOMIC IMPACTS OF THE TRANS-ALASKA PIPELINE SYSTEM

While 1973-76 employment and population growth in Alaska was enormous, so was the reduction in employment and population that occurred after the pipeline was finished in 1977. As shown in Figure 3-1, there was a large out-migration in the years immediately following completion of TAPS. Employment shrank by more than 8.5 percent between 1976 and 1977, and by 1981, Alaska employment was very close to what would have been predicted by the pre-1974 trend. Thus, the employment and population effect of the construction phase of TAPS was largely short-term (Carrington 1996).

The long-term impacts of TAPS on the state economy, however, were huge, as they were magnified considerably by the state's decision to share its newfound oil wealth through capital projects, school debt reimbursement programs, subsidized mortgage rates, power cost equalization, and the PFD (Information Insights 2004). The state spending fueled an "oil boom" from 1980 to 1985. This period of unprecedented economic growth is described in more detail in the next section, which describes the long-term economic aftermath of TAPS as well as other developments in Alaska's economy during the past 33 years.

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4.0 THE POST-TRANS-ALASKA PIPELINE SYSTEM ERA

The final weld was completed on TAPS on May 31, 1977, and for the next three decades Alaska's economy would go through a transformation few could imagine (Fried 2007). Of all the natural resources produced and sold in Alaska since its purchase from Russia, petroleum has accounted for 90 percent of the total value (Goldsmith 2007).

The next sections describe how the Alaska economy has developed since the completion of TAPS, starting with the spurt in economic growth resulting from the increase in state revenues. The focus is on the trends in what have been the major economic drivers, including the petroleum industry and federal government. In addition, the post-TAPS discussion examines trends in demographics, the role of other economic sectors, the cost of living, and the economy of rural Alaska, particularly as it relates to economic changes experienced by the Alaska Native population.

4.1 1980s BOOM-AND-BUST

4.1.1 The Boom

The story of Prudhoe Bay and the Alaska economy would have been much different if the State of Alaska did not own the land and petroleum resources beneath the Prudhoe Bay oil development (Goldsmith et al. 2009). State ownership of the land where the oil is produced has meant that a large share of the value added from production, and most importantly, a large portion of the economic rent from that production, could be captured by state government through taxes and royalties (ownership payments based on the wellhead value of the oil) (Goldsmith 2010a).

In 1970, the state treasury received a major economic kick start in the form of \$903 million in oil-related rents and lease bonus payments (Goldsmith et al. 2009). Taxation on North Slope oil production was crafted by the Alaska Legislature in 1973. With the oil price increase that resulted from the Iranian Revolution in 1979, the state's oil revenues, including royalties, grew dramatically. The state's budget doubled in one year from \$1.6 billion in 1980 to \$3.4 billion in 1981 (Fried 2007). By 1985, Alaska's combined state and local government spending per resident had climbed to 300 percent of the national average (Leask et al. 2001).

Before TAPS, taxpayers in Alaska bore the second-highest tax burden in the country. In 1980, with rising oil tax revenue, Alaska repealed its personal income tax and by 1982, it was sending out PFD checks to Alaskans instead (IHS Global Insight 2010). The Permanent Fund was established in 1976, with fund deposits coming from a 25 percent share of state oil and gas royalties (Goldsmith 2010a). The fund balance was invested in a portfolio of assets to maximize its long-run rate of return. To ensure that all Alaska residents benefited from oil production on state-owned lands, the state legislature passed a plan in 1982 that annually paid each resident, regardless of age, an equal amount out of the appropriable earnings of the Permanent Fund (Goldsmith 2010a).

As a result of the oil wealth, nearly every aspect of the state's economy grew at breakneck speed during the first five years of the 1980s (Fried 2007). The employment opportunities created by oil-fueled state spending contributed to population growth throughout the state. Between 1980 and 1985, the state's population grew by more than 120,000, a state record for a five-year period (Figure 2-1 and Figure 3-1). In fact, it would take another 22 years before the state would add that

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many people again (Fried 2007). As during the construction phase of TAPS, the post-TAPS oil boom coincided with a national economic downturn, which amplified the population impacts. The 1980-1982 U.S. recession, which was partially caused by the Iranian oil embargo, left millions of workers in the contiguous U.S. unemployed and more likely to move in search of work. In contrast, Alaska had an especially strong economy with high wages and plentiful jobs (Fried 2009).

4.1.2 The Bust

The post-TAPS economic boom in Alaska came to an abrupt halt in 1986, when the world oil price fell to \$10 per barrel after Saudi Arabia linked its oil price to the spot market for crude oil and increased production. The resultant drop in state oil revenues led to severe cutbacks in government services and programs, and economic activity in the state declined markedly (Haycox 2009). The 1986-1989 state recession caused major population and structural changes to the economy. Between 1985 and 1989, 44,000 more people left Alaska than arrived (Figure 3-1), and there was a dramatic increase in home loan foreclosures and business bankruptcies (Fried 2007). The construction workforce, which was dominated by young, single males with high incomes, was cut in half over a very short period. Unemployed construction workers tended to leave the state rather than work in other industries (Information Insights 2004). The dramatic economic downturn underscored the vulnerability of Alaska's economy to the volatility of international commodity markets.

In the early 1990s, the state's economy started to rebound. The first years of the economic recovery were also marked by the years of peak North Slope oil production (Fried 2007). The economic recovery also coincided with the 1990-1991 U.S. recession caused by the 1989 Savings and Loan Crisis, and another wave of economic refugees arrived in Alaska (Figure 3-1). By 1990, the state's population and workforce had hit record highs (Fried 2007).

The two decades following the initial economic recovery would be the longest period of uninterrupted growth in the state's history, albeit significantly slower than previous periods (Fried 2007). From 1959 to 1987, employment in Alaska grew by nearly six percent per year versus two percent during the most recent expansionary period, and population growth slowed to about one percent versus three percent per year (Fried 2007). Declining North Slope oil production has been the major reason for the general slowdown in economic activity. On the other hand, rapid growth in federal spending, together with sharply higher oil prices and a new oil and gas production tax structure in the most recent years, have helped offset the effects of decreasing oil production (Leask et al. 2006). The next sections describe these demographic and economic developments in more detail.

4.2 SOCIOECONOMIC TRENDS IN THE POST- TRANS-ALASKA PIPELINE SYSTEM ERA

4.2.1 Population and Employment

Between 1970 and 2010, the Alaska population and economy grew significantly. Alaska's pre-pipeline population, 302,603 in 1970, had more than doubled to an estimated 710,231 by 2010. The state's economy and workforce have grown correspondingly, as evidenced by the fact that the state's construction labor pool alone is now almost equal to the total APSC workforce at the peak of TAPS construction. In addition to being much larger, U.S. Census Bureau data and other

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sources indicate that Alaska's population has changed over the past four decades in other ways, including the following:

- Diversity – Alaskans have become more ethnically diverse, especially in urban areas (Leask et al. 2006).
- Stability – the share of residents who had been in Alaska at least five years grew from 56 percent in 1970 to around 81 percent by 2000, the most recent year for which data were available.
- Age – Alaskans' median age was 22.9 in 1970 and 33.8 in 2010.
- Gender balance – the population was 54.3 percent male in 1970; by 2010, it was 52.0 percent male.
- Concentration – Alaskans have become increasingly concentrated in the Southcentral region because the boroughs to the north and south of Anchorage grew so fast in recent decades (Leask et al. 2006). In 1970, Anchorage, the Matanuska-Susitna Borough, and the Kenai Peninsula Borough made up just under half the state population. By 2010, that share was 61 percent. Nearly 80 percent of Alaskans live in the five largest urban areas, the Southcentral region plus the Fairbanks North Star Borough and Juneau. That is up from 69 percent in 1970.

Despite Alaska's population growth, only three states have smaller populations, and Alaska remains the least densely populated state by far (Goldsmith 2010b). The small population means there is still a lack of competition in some industries and an inability of firms serving the in-state market to take advantage of economies of scale in operations. These factors contribute to persistent higher prices to consumers and a higher cost of living. Moreover, the small population limits the size of the labor market and the range of expertise it includes (Goldsmith 2010b).

It is also important to note that Alaska's labor needs extend beyond the demand for more workers. The state's skilled workforce is aging, and these proficient and productive workers are retiring in increasing numbers. The aging skilled workforce is a national issue, but it is accentuated in Alaska, where aging "baby boomers" (persons born between 1946 and 1964) dominate demographics more than most states (Rosen 2007). The problem is rooted in historical circumstance. As discussed above, in the late 1970s and early 1980s while the rest of the nation was mired in recession, Alaska's economy was exploding with jobs associated with construction of TAPS and the subsequent state oil-revenue boom. Tens of thousands of youthful and footloose baby boomers poured into the state during this period (Rosen 2007).

Many of the migrants remained in Alaska after the economic surge faded, and the demographic impact can be seen in the decades that followed (Hadland and Williams 2000). Although only 7.8 percent of Alaskans were older than 65 in 2010 — compared to the nation's 12.9 percent — Alaska's senior population is growing faster than in most other states. As noted, the share of baby boomers in Alaska's population is among the highest of any state. As these individuals move into their retirement years, the state's 65-plus population is expected to more than double by 2020 (Fried 2010b).

The aging population is evident in the composition of Alaska's workforce. Between 1998 and 2008, the percent of Alaska resident workers between the ages of 55 and 64 increased from 6.7 to 12.4 percent (Kreiger 2010). While the number of older workers is small relative to other age

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groups, older workers are of particular interest because they earn higher wages and possess skills and knowledge acquired over many years (Kreiger 2010). There is concern that the skills of the young residents may be inadequate to replace the talent and expertise of the baby boomers exiting the workforce. In general, Alaska's education infrastructure is more robust now than 40 years ago (Alaska Department of Labor and Workforce Development 2007); however, only 62 percent of Alaskan high school graduates remain in Alaska for training or employment each year. The rest leave the state. Furthermore, while over 90 percent of Alaskans have completed high school or equivalency (which is well above the national average of 84.5 percent) (IHS Global Insight 2010), only 28 percent of Alaskans age 18 to 24 attend any type of education after high school, the lowest percentage of any state (Alaska Department of Labor and Workforce Development 2007). Consequently, employers in Alaska often have difficulty recruiting individuals who have more than the most basic job skills. In short, just as a disproportionately large number of Alaskans approach retirement age, Alaska employers may find an increasingly shallow pool of available, skilled workers from which to draw (Hadland and Williams 2000; Hunsinger 2007).

In recent years, recognition that construction of a major natural gas project would require the development of a skilled workforce has led to increased efforts to address workforce development in Alaska. In 2008, the Alaska Department of Labor and Workforce Development developed the "Alaska Gasline Inducement Act Training Strategic Plan," the overall purpose of which is to enhance Alaska's existing training programs so that Alaskans are afforded the opportunity to upgrade skills and acquire new ones in preparation for replacing an aging workforce and for possible gas project jobs. The U.S. Department of Labor made a federal grant award of \$7.5 million for the Alaska Department of Labor and Workforce Development to spend on skill training programs for jobs in gas project construction and maintenance (Office of the Governor 2007). In addition, there have been significant Alaska legislative investments that connect with pipeline-related occupations, including funding for construction academies in various communities in the state and a comprehensive pipeline worker training facility in Fairbanks (Alaska Department of Revenue and Department of Natural Resources 2009). In 2014, the Alaska Department of Labor and Workforce Development released an updated workforce development plan for Alaska's oil and gas industry that includes a new action agenda to increase alignment of education, training, and incentives to produce a qualified resident workforce (Alaska Department of Labor and Workforce Development 2014a).

4.2.2 Petroleum Industry

By far, petroleum continues to be the most important natural resource sector in the state and the largest private economic driver, as demonstrated by the following economic statistics provided by Goldsmith (2007):

- Oil production accounts for roughly 82 percent of the value of all marketed natural resource production in the state.
- Investment spending by the oil industry directly accounts for 60 percent of all private investment (including hospitals, residential housing, etc.).
- Oil production (not including support activities) directly accounts for a quarter of total gross state product.

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- About a third of all personal income in the state can be traced to the oil industry (either due to work in oil production-related activities, spending of the state's oil revenues, or the Permanent Fund Dividend).
- Similarly, about a third of all jobs can be traced to the oil industry, even though only about three percent of all jobs are directly involved in the production, transportation, and refining of oil.

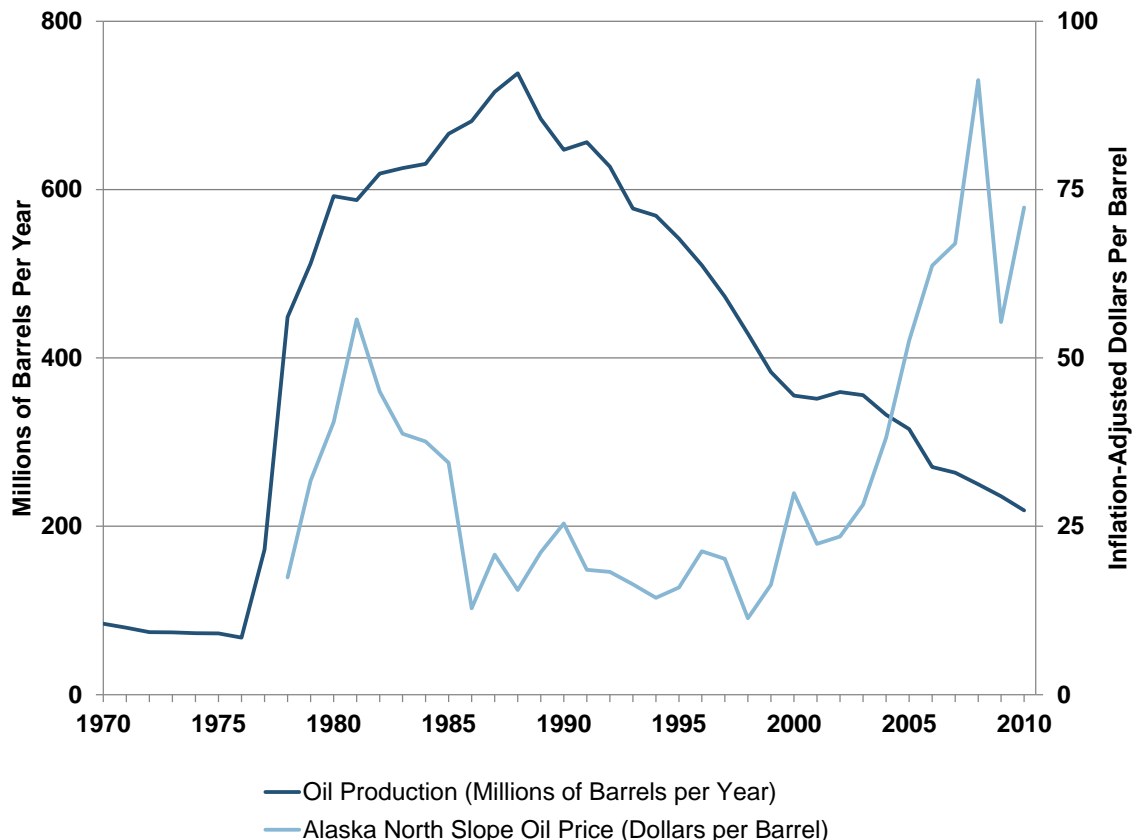
Petroleum has maintained its economic importance despite the fact that Alaska's crude oil production has declined to less than a third of its 1988 peak, when it accounted for 25 percent of U.S. production. Today, Alaska's share of domestic production has fallen to approximately 10 percent, and the state has slipped to be the fourth largest producer in the nation, behind Texas, North Dakota and California (Resource Development Council for Alaska 2013; U.S. Energy Information Administration 2014b). Production has decreased as the pressure created by underground deposits of natural gas, which helps drive oil to the surface, has lessened, and the most easily accessible oil has been extracted.

Most of the oil produced in the state is sent to refineries located elsewhere in the United States, primarily the West Coast. Alaska's small in-state refining capacity was made even smaller in 2014 by the closure of the Flint Hills refinery in Fairbanks due to environmental costs and market pressures (Cole 2014).

Because of volatility in the price of crude, the annual wellhead value has fluctuated considerably in the last several years. Inflation-adjusted oil prices reached an all-time low in 1998 as the "Tiger Economies" of Asia spiralled into crisis, cutting oil demand. Just 10 years later oil prices reached a record high due to strong demand, stagnating world production, speculation, or other factors. However, in the face of recession and falling demand, this peak was followed by one of the sharpest drops in history.

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Figure 4-1. Alaska Oil Production and Average Annual Price, 1970 to 2010



Source: U.S. Energy Information Administration (2014a) and Alaska Department of Natural Resources (2010a)

Natural gas produced with North Slope crude oil has historically been re-injected to maintain field pressure, except for a small share used for various purposes on the leases and for power generation. Since the 1970s, several projects have been proposed to ship North Slope natural gas by pipeline through Canada to North American markets. Most recently, proposed projects to send North Slope gas to the U.S. Midwest were shelved in 2011-2012 following a large and rapid expansion of shale gas development in the Marcellus, Eagle Ford, Haynesville and other formations in the contiguous United States. With natural gas in North American markets having grown plentiful and cheap relative to Alaska gas, new plans were proposed in 2012 to send North Slope gas abroad on carriers in the form of liquefied natural gas. The consuming markets would mostly likely be in Asia, where LNG fetches the highest prices in the world today due to demand conditions and LNG's linkage with oil prices.

Natural gas, and a small amount of crude oil, is also produced in the Cook Inlet region. Historically, the largest uses of Cook Inlet gas were industrial, including conversion to LNG and production of ammonia-urea fertilizer at facilities in Nikiski. Alaska began exporting regular shipments of LNG in 1969, mostly through contracts with two Japanese utilities from export facilities in Nikiski on the Kenai Peninsula. Exports ceased in 2013 due to concerns about shortages in Cook Inlet gas supplies, but resumed in mid-2014. The fertilizer plant closed in 2007 as a result of the high price and low supply of Cook Inlet gas, but plans to restart it were under discussion in 2014. With the

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reduction in industrial use, most Cook Inlet gas is used for space heating or electricity generation in Southcentral Alaska.

As noted above, about a third of all jobs in Alaska are linked to the petroleum industry; yet only about four percent of all jobs are directly involved in oil production, transportation, and refining (Fried 2013a). Because the oil industry is very capital intensive, increases and decreases in output have a more muted impact on employment (IHS Global Insight 2010).

In addition, while jobs in Alaska's petroleum industry tend to be high-paying (average payroll and compensation is the highest of all Alaska industries), a portion of these jobs are filled by non-resident workers (Goldsmith 2010b). Due to Alaska's limited pool of local workers with specialized oil-related skills, there has been a tendency for employers to recruit a portion of their workers from outside the state (Hadland et al. 2011). This is possible because most oilfield jobs are located in remote worksites or camps and have a two-week-on, two-week-off rotation. By commuting from an established home outside of Alaska, families can avoid a potentially disruptive move and the higher cost of living in Alaska (Goldsmith et al. 2009). Over the past decade, the percentage of non-resident oil and gas workers has fluctuated between 26 and 31 percent (Fried 2013a). The payroll accruing to non-resident workers does not contribute significantly to the Alaska economy, as these workers generally do not own homes or consume the bulk of their earnings in the state (Goldsmith 2010b).

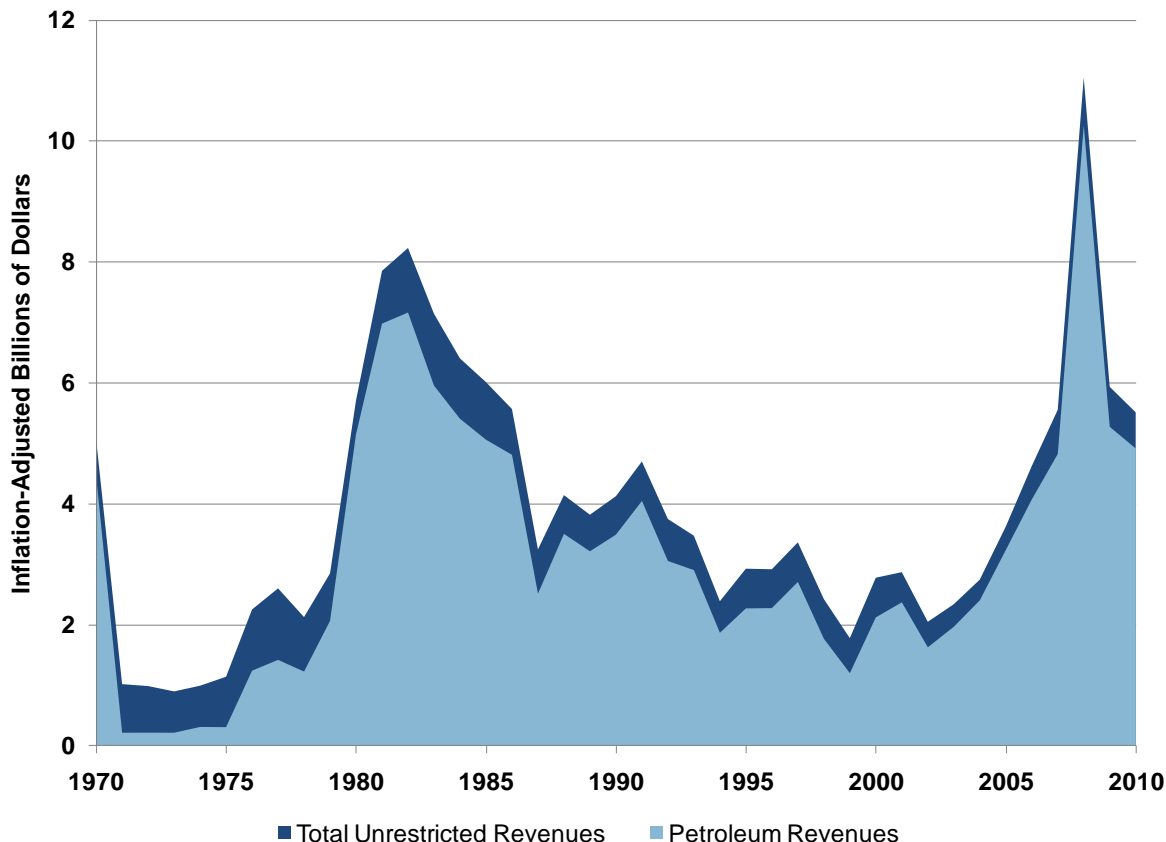
4.2.2.1 State Revenue

As discussed above, another important linkage of the oil industry to the Alaska economy is public revenues because the state generates revenues through royalties and taxes. The cumulative value of the 16 billion barrels of oil that have been produced from state land since 1959 has been about \$500 billion, and the state has collected about \$150 billion (2009 dollars) of that total (Goldsmith 2010a).

For over two decades, about 80 percent of Alaska's unrestricted general fund revenue has come from oil taxation (Figure 4-2). Today, revenue from oil production continues to dominate the state's revenue picture, accounting for 56 percent of the state budget and approximately 93 percent of the state general fund in 2012 (Alaska Department of Revenue 2013). The general fund pays for almost every state service, including the education system, transportation infrastructure, public health and safety services, and a host of other programs throughout Alaska. As a result of this oil revenue, Alaska's state and local tax burden on households has been the lowest among states over the past several years (IHS Global Insight 2010).

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Figure 4-2. Alaska Unrestricted General Fund Revenues, 1970-2010



Source: Adapted from Leask et al. (2001). Additional data from Alaska Department of Revenue (2011)

Another legacy of oil, the Permanent Fund, has poured over \$17.5 billion in dividends into the state's economy from 1982 to 2009. In 2013, the fund, at \$47 billion, ranked twenty-fourth among all sovereign wealth funds (Sovereign Wealth Fund Institute 2013).⁸ The 2013 dividend added about \$580 million in purchasing power to the economy (before taxes), roughly equivalent to half the total wages of the state's retail trade sector.

As noted above, however, Alaska's oil production has declined, and oil prices have been volatile. One consequence of these developments has been an overall reduction in state and local government per-capita spending during the past couple of decades (Leask et al. 2001; usgovernmentspending.com 2013). On the other hand, the Alaska legislature has prevented wide year-to-year swings in state expenditures by tapping the Constitutional Budget Reserve Fund (CBRF) (Fried 2007). As early as the late 1970s, numerous groups and individuals had pointed out the need for Alaska to establish a savings fund to protect against swings in commodity prices for natural resources (Alaska Department of Revenue 2009). It was not until 1990, however, that

⁸ Sovereign wealth funds are government-owned investment funds composed of financial assets such as stocks, bonds, property, precious metals, or other financial instruments (Sovereign Wealth Fund Institute 2013).

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Alaska voters approved a constitutional amendment requiring the state to deposit all settlements from oil and gas tax and royalty disputes into the CBRF (see Figure 4-3).⁹ The CBRF has served the state well as a budget stabilization fund in years of low oil revenue (Alaska Department of Revenue 2009).

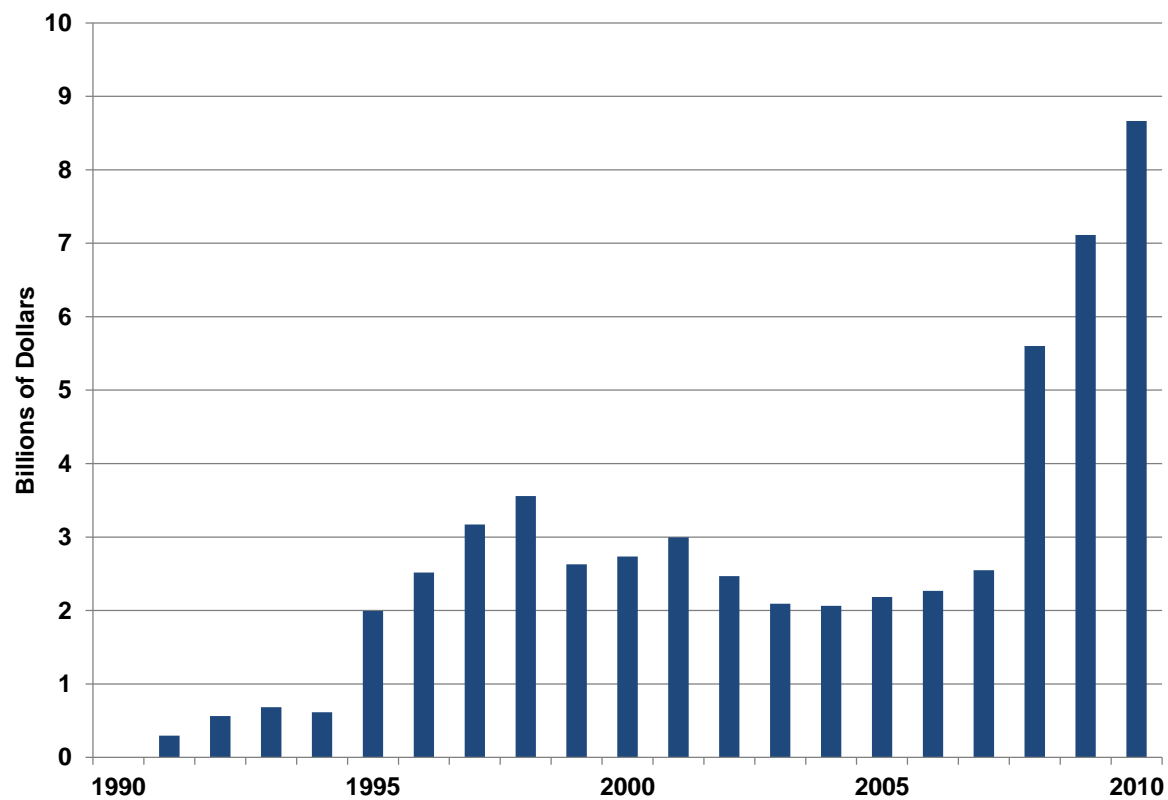
4.2.3 Federal Expenditures

As discussed in Section 2.0, the federal government has long played an important economic role in Alaska. After statehood, development of the private sector and a decline in the military presence gradually reduced federal importance to Alaska's economy (Fried 2007). For example, when the Soviet threat began to evaporate in the early 1990s and Cold War tensions eased, the number of military personnel in Alaska fell as bases around the state were closed (Fried and Windisch-Cole 2006). As shown in Figure 4-4, starting in the late 1990s, federal spending in Alaska began growing again at a much faster pace, and the federal government re-emerged as a major economic force (Fried 2007). Between 1995 and 2005, federal spending in Alaska increased by \$5 billion, or 118 percent. No other sector of the economy generated that kind of economic punch (Goldsmith 2008b). Until 1996, per-capita federal spending in Alaska was about 38 percent above the national average; by 2008, it was 52 percent above the U.S. average and third among the states (Goldsmith 2008b; Goldsmith 2012). Currently, about a third of the jobs and personal income in Alaska can be traced directly or indirectly to all types of federal spending (Goldsmith 2010a).

⁹ In 1986, as Alaska's economy cratered under the pressure of \$10 per barrel oil, the Alaska legislature created a "rainy day" account, the Statutory Budget Reserve. The Statutory Budget Reserve covered general fund shortfalls using "excess revenues" from more profitable years. The legislature seeded the account with the balance of the remaining general funds at the end of Fiscal Year 1991, but by Fiscal Year 1994, all of the money had been appropriated. The Statutory Budget Reserve lay empty until 2008, when state revenue soared as the price of oil reached a record high, and the legislature deposited approximately \$1 billion in the account (Alaska Department of Revenue 2009).

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Figure 4-3. Ending Balance of Alaska's Constitutional Budget Reserve Main Account and Sub Account, 1991-2010¹

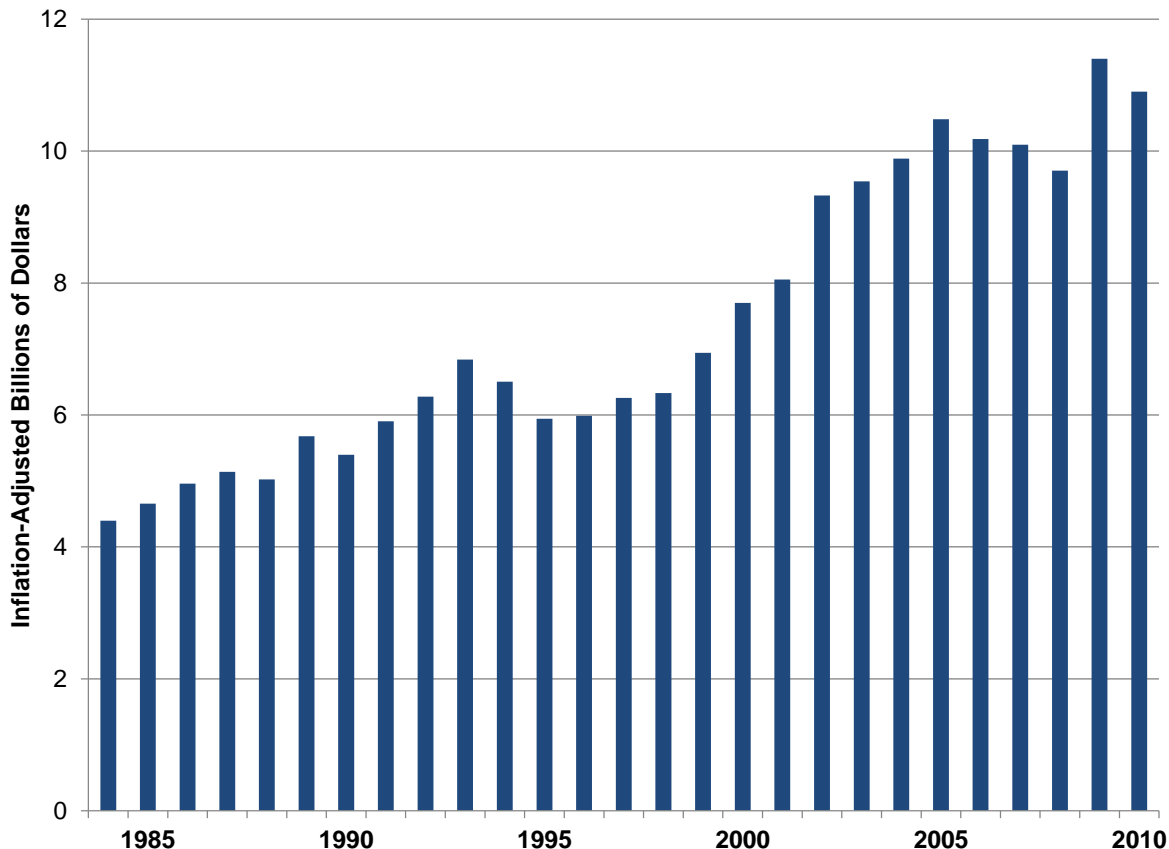


¹ The CBR sub-account is a separate fund invested and managed with a longer time horizon than the main fund.

Source: Alaska Department of Revenue (2009) and Alaska Department of Revenue (2014)

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Figure 4-4. Federal Expenditures in Alaska, 1984 to 2010



Source: Adapted from Goldsmith (2008b) and Goldsmith (2012). Additional data from U.S. Census Bureau (2011a)

Even with numbers of military personnel at about two-thirds of 1960 levels, the military remains Alaska's single largest employer, and Department of Defense spending remains vital to the state's economy. In 2008, the Department of Defense spent \$3.42 billion in Alaska, which represented more than a third of total federal spending in the state. Alaska is among the top states in terms of Department of Defense expenditures per capita (Goldsmith 2012).

Non-defense federal spending is also critical to Alaska's economy. Federal civilians were the third largest group of employees in the state in 2009 (Fried 2010d). The rate of federal employment in Alaska is more than three times the average for the entire U.S. and second only to Hawaii. State and local government employment rates in Alaska also rank high among the states, but do not diverge nearly as much from the national average (Goldsmith 2010b).

Non-defense federal spending in Alaska can be divided into three main categories. The first is the direct operations of federal government agencies. The second consists of the direct payments (transfers) to individuals and private and public entities, the most important programs in terms of dollar amounts being Social Security, federal-civilian retirement, and health-related programs like Medicare. The third component consists of capital and operating grants to state and local governments as well as to non-profit corporations (Goldsmith 2010b).

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Grants were the fastest-growing federal expense in Alaska, jumping from \$1.3 billion to \$3.1 billion between 1996 and 2002 (Goldsmith 2003). Grant have since trended downward, except in 2009 and 2010, when they were supplemented by funds from the American Recovery and Reinvestment Act of 2009 (Goldsmith 2012). Federal grants account for most of the state capital budget and for important shares of some state agency operating budgets like the Alaska Department of Health and Social Services. In addition, grants are important for the operation of Alaska Native non-profit health and housing programs (Goldsmith 2010b).

Alaska's congressional delegation secured \$87 million in earmarks in 2010, compared to \$227 million in 2009 (Bolstad 2010; Taxpayers for Common Sense 2010). Across states, Alaska's per-capita share of earmark money dropped from first to sixth (Taxpayers for Common Sense 2010). Nevertheless, Figure 4-4 shows that federal expenditures in Alaska hit a record high in 2009 due largely to funds received under The American Recovery and Reinvestment Act. Alaska was first among the states in per-capita stimulus funds, with more than \$3,000 per capita, or nearly four times the national average (Goldsmith 2012).

This level of "stimulus funding" is not expected to continue. Most of the funds Alaska received under the American Recovery and Reinvestment Act have been spent; consequently, the increment they represented to federal spending in the state in 2009 and 2010 began dwindling in 2011 (Goldsmith 2012). Nevertheless, military bases and other existing federal infrastructure, large federal land holdings, and obligations to Alaska Natives ensure that federal expenditures in Alaska will remain high in the foreseeable future (Leask et al. 2006; Bolstad 2010).

The major role that the federal government plays in Alaska's economy has both positive and negative economic impacts. In addition to providing an infusion of outside dollars into the economy, government jobs tend not to have the volatility as those in other economic sectors, and they provide relatively high pay and comprehensive benefits. On the other hand, the major role of the federal government makes the state's labor market less responsive. Further, it creates a potential fiscal distortion since government enterprises enjoy tax-exempt status, but contribute to the demand for public goods and services. Although some forms of payment by the federal government are designed to compensate the state and local governments for this distortion, it is not clear whether this tax-exempt status shifts some of the burden of paying for public services to the private economy (Goldsmith 2010b). Alaska does not have a personal income or statewide sales tax that would generate revenues to offset the costs of public services provided to government enterprises.

4.2.4 Other Economic Drivers

The wealth from North Slope oil production and the local availability of petroleum products have given "non-oil" economic drivers a boost. Low taxes and high public spending on both operations and infrastructure have provided the travel, fishing, mining, and air cargo industries with growth opportunities they would not otherwise have had (Goldsmith 2007).

Of course, factors besides the development of the state's oil industry also contributed to the expansion of these other economic drivers. Alaska's seafood industry grew in the 1970s and 1980s with the recovery of Alaska salmon runs, development of profitable new crab fisheries, and replacement of foreign boats with American boats and processors in the Bering Sea groundfish fisheries (Leask et al. 2001). As a result of establishment of the domestic groundfish fisheries, Dutch Harbor-Unalaska has been a leading U.S. fishing port in quantity of commercial fishery

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landings since 1997 (NOAA Fisheries Service 2012). In the 1990s, over-capitalization and competition from farmed salmon from Norway and Chile severely eroded profits in Alaska's salmon fisheries. The economic condition of the salmon fisheries has improved in recent years, however, due to larger harvests and increases in salmon prices. Alaska seafood in 2011 accounted for roughly 10 percent of the total value of the U.S. seafood supply, including domestic production and imports (McDowell Group 2013).

The seafood industry directly employed an estimated 63,100 people in Alaska in 2011, 27,230 of whom were Alaska residents. Roughly 1-in-8 workers in Alaska earned at least part of their annual income directly from the seafood industry in 2011. These direct jobs produced \$4.6 billion worth of wholesale seafood and resulted in an estimated \$1.7 billion in labor income. Salmon fisheries create the largest total economic impact in Alaska, followed by federal groundfish/flatfish fisheries and the halibut/sablefish fisheries. Salmon fisheries generate higher levels of secondary economic activity within Alaska compared to other fisheries due to higher rates of Alaska resident involvement, more shore-side processing, greater in-state purchases of goods and services in support of fishing operations, and the presence of salmon hatcheries (McDowell Group 2013).

Since the 1990s, the travel industry, buoyed by tourism, has been one of the fastest growing contributors to the state's economy. Cruise ship passenger volumes in Alaska began to accelerate in the late 1990s as cruises became more affordable. A little more than half of visitors to Alaska arrive by cruise ship, while the rest come by air, highway or ferry. The number of visitors climbed from 39,000 in 1961 to 1,966,700 — the largest annual visitor count in Alaska's history — for the 12-month period of May 2013 through April 2014 (Leask et al. 2001; McDowell Group 2014b). During that same period, visitors spent an estimated \$1.82 billion in the state (this figure excludes the cost of transportation to and from the state, such as air tickets, cruise or cruise/tour packages, and ferry tickets) (McDowell Group 2014a).

While total travel expenditures in Alaska are small compared to other western states, Alaska ranks high on the basis of per-capita visitor spending, behind only Nevada, Hawaii, and Wyoming. These expenditures support employment, expand the payrolls, and generate profits for restaurants, hotels, sightseeing and other businesses linked to the visitor industry (Goldsmith 2010b). The visitor industry accounts for about nine percent of the state's employment (McDowell Group 2014b).

In the post-TAPS era mining added few jobs until the 1990s, when mineral production — chiefly zinc — increased sharply as a result of relatively strong prices (Leask et al. 2001; Gilbertsen and Robinson 2003). More recently, Alaska mineral production value increased from less than \$1 billion in 2001 to more than \$3.5 billion in 2011, due largely to higher prices rather than changes to production amounts (Fried and Robinson 2008; Abrahamson 2013). Although the gains have also come from new mines, the mining industry in Alaska (and elsewhere) has encountered large barriers to entry. Finding, developing, and producing the minerals and metals is time-consuming and expensive, and because mineral and metal prices are highly cyclical, companies must time their activities so that mines do not become active as mineral and metal prices decline.

Timber harvests and employment grew through the 1980s, but by the late 1990s, increased supplies of raw material in the global marketplace had driven prices down and increased competition (Leask et al. 2001; Gilbertsen and Robinson 2003). Both of Alaska's pulp mills closed in the 1990s due to high costs and supply constraints. By 2009, there were only about 600 jobs in the timber industry, down from 4,000 jobs in 1990 (Schultz 2010).

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Alaska's air cargo trans-shipment industry is an economic driver that has developed largely since statehood. Among the advantages of Ted Stevens Anchorage International Airport as a global air cargo center are that it lies equidistant between Europe and Asia and has the lowest landing fees and terminal rental rates among major cargo airports (Inboundlogistics.com 2004). By 2010, this airport was one of largest in the U.S. in terms of amount of cargo handled, second only to Memphis International Airport (and had the fifth highest amount of cargo of any airport in the world) (Airports Council International 2013).

On the negative side, Alaska continues to be the state with the fewest manufacturing companies. Currently, manufacturing makes up only about four percent of Alaska's employment and represents just two percent of the gross state product. Seafood processing represents nearly three-quarters of the manufacturing employment (Fried 2010c). While seafood processing remains a major industry in some coastal areas of Alaska, in recent years processing capacity has been lost to low-cost countries in Asia as a result of outsourcing of some fish processing operations, including cleaning, filleting and packaging (Bauman 2007). With respect to Alaska's oil and gas industry, forward linkages to refining and petrochemical manufacturing have emerged in Alaska, but only on a modest scale. A small share of the state's crude oil production feeds refineries at North Pole, Nikiski, and Valdez that provide the majority of gasoline, diesel, heating oil, and jet fuel for local markets (Goldsmith 2010b).¹⁰

4.2.5 Support Industries

Alaska's economy continues to have limited capability to supply inputs to the exploitation of the natural resources that are the basis for the economy (Goldsmith et al. 2009). Development of the support sector has been hamstrung by the state's small market size and high cost of business (IHS Global Insight 2010). The lack of backward linkages (purchases of goods and services from other industries) makes it difficult for the state economy to capture much of the economic activity associated with development of petroleum and other natural resources. There have been some advances, however, such as firms in Anchorage and Fairbanks that provide transportation, logistics, and warehousing services for the petroleum industry operations on the North Slope (Goldsmith 2010b). Toward the end of the 1990s, for the first time, companies in Alaska assembled industry modules destined for Prudhoe Bay (although larger modules are still fabricated outside the state and barged directly to the North Slope) (Goldsmith et al. 2009; Goldsmith 2010b).

By the early to mid-1990s, most of the state's growth in employment was sustained by a mixture of industries in the trade, healthcare, and social service sectors (Fried 2007). These sectors have increased due to overall population growth, the growing senior population, and expansion of the tourist industry. Between 2000 and 2009, healthcare employment increased 46 percent, about five times as fast as the state's population and three times as fast as all other sectors of the economy (Health Workforce Planning Coalition 2010).

During the first five years of the 1990s, which are sometimes referred to as Alaska's retail boom years, approximately 5,400 new retail jobs were created, due largely to an influx of big box stores and discount warehouses (Fried 2004). Injection of about \$1 billion annually into the economy from Permanent Fund dividends also fueled growth in the retail and wholesale trade sector (Leask

¹⁰ The state government has taken a portion of its oil royalties in kind — that is, in oil — and sold the oil under long-term contracts to help develop local refineries (Leask et al. 2006).

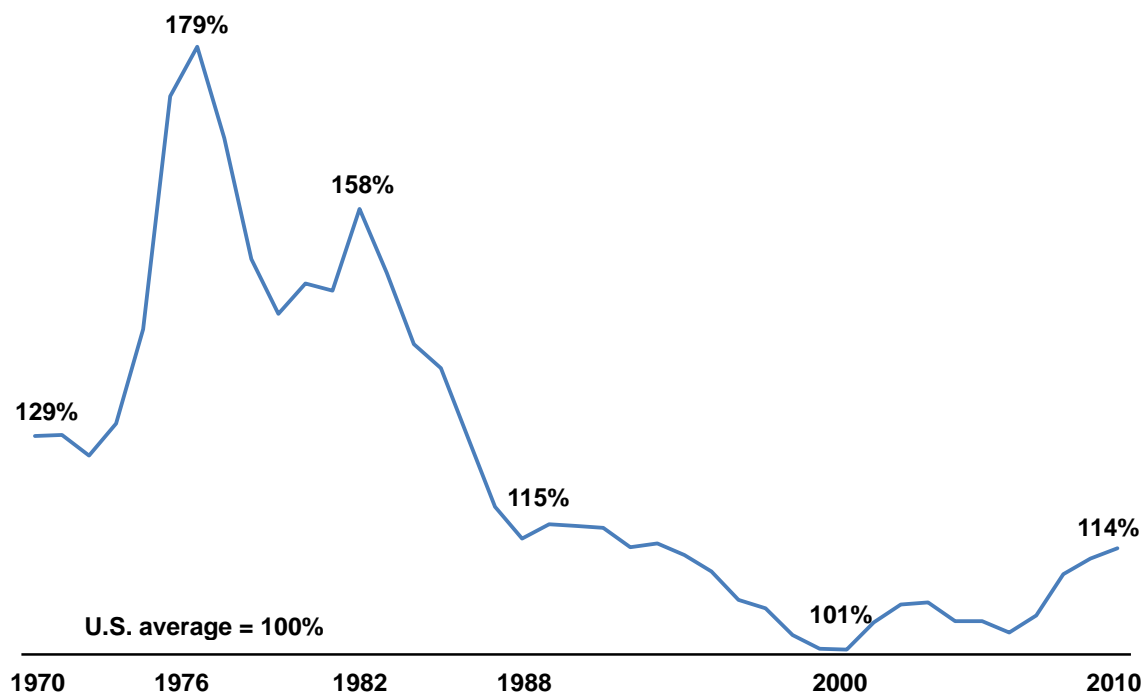
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et al. 2001). By 2010, the sector accounted for 11.4 percent of all employment, making it the single largest private-sector employer group in the state (U.S. Department of Commerce 2013b). Low wages and a preponderance of part-time and seasonal employment reduce the retail trade sector's contribution to payroll; it pays the lowest average monthly wage of any industry in the state (Fried 2004). While Alaska's retail and wholesale industry represented 11.4 percent of total employment in 2010, only 7.3 percent of the total payroll came from that industry (U.S. Department of Commerce 2013b).

4.2.6 Cost of Living

Per-capita incomes of Alaskans increased sharply in the 1970s, reflecting the pipeline construction boom that created many high-paying jobs (Figure 4-5). Incomes remained 50 percent above the U.S. average in the early 1980s, during the boom created by high state spending; however, Alaska incomes had fallen to the U.S. average by 2000. The decline reflects slower job growth, elimination of some high-paying jobs in the oil industry, and the addition of lower-paying retail trade and service jobs (Leask et al. 2001).

Figure 4-5. Alaska Per-capita Income as a Percentage of U.S. Per-capita Income, 1970 to 2010

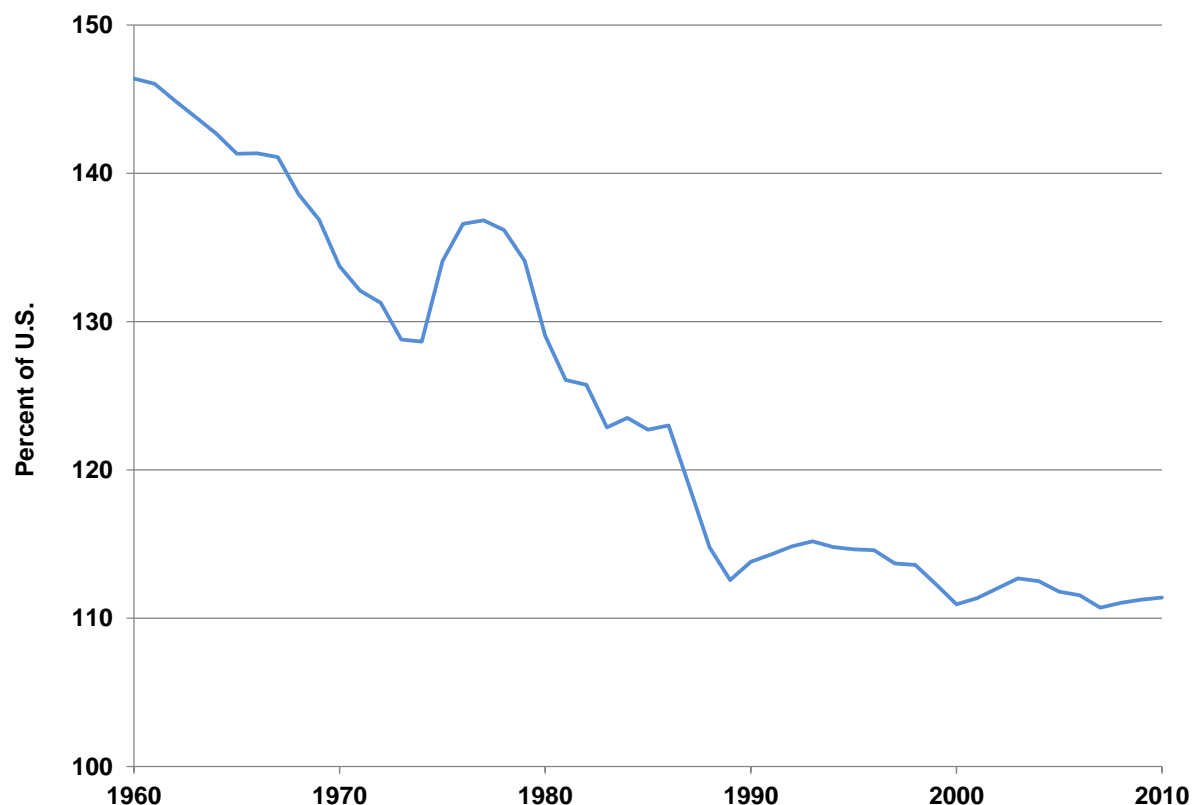


Source: Adapted from Leask et al. (2006). Additional data from U.S. Department of Commerce, Bureau of Economic Analysis (2013b)

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Although Alaska's per-capita income advantage largely disappeared, Figure 4-6 shows that the cost of living, particularly in the more urban parts of the state, also moved closer to the U.S. average, largely due to larger local economies, more efficient transportation, and lower inflation in Anchorage than in other U.S. cities (Fried 2007). Nevertheless, the cost to live in Anchorage, Juneau, Fairbanks, and Kodiak is still well above the national average (Fried 2010a). Expensive housing in Alaska's cities is not the only component that drives up overall consumer costs. Consumer expenditures in all categories continue to be above the U.S. city standard (Fried 2010a). The cost of energy makes up a significant portion of households' monthly expenditures, especially in rural Alaska communities that rely on diesel fuel for power generation and heating (Saylor et al. 2008).

Figure 4-6. Anchorage Living Costs as a Percentage of U.S. Living Costs, 1960 to 2010



Source: Adapted from Leask et al. (2006). Additional data from Fried (2013b).

4.2.7 Rural Alaska and the Alaska Native Population

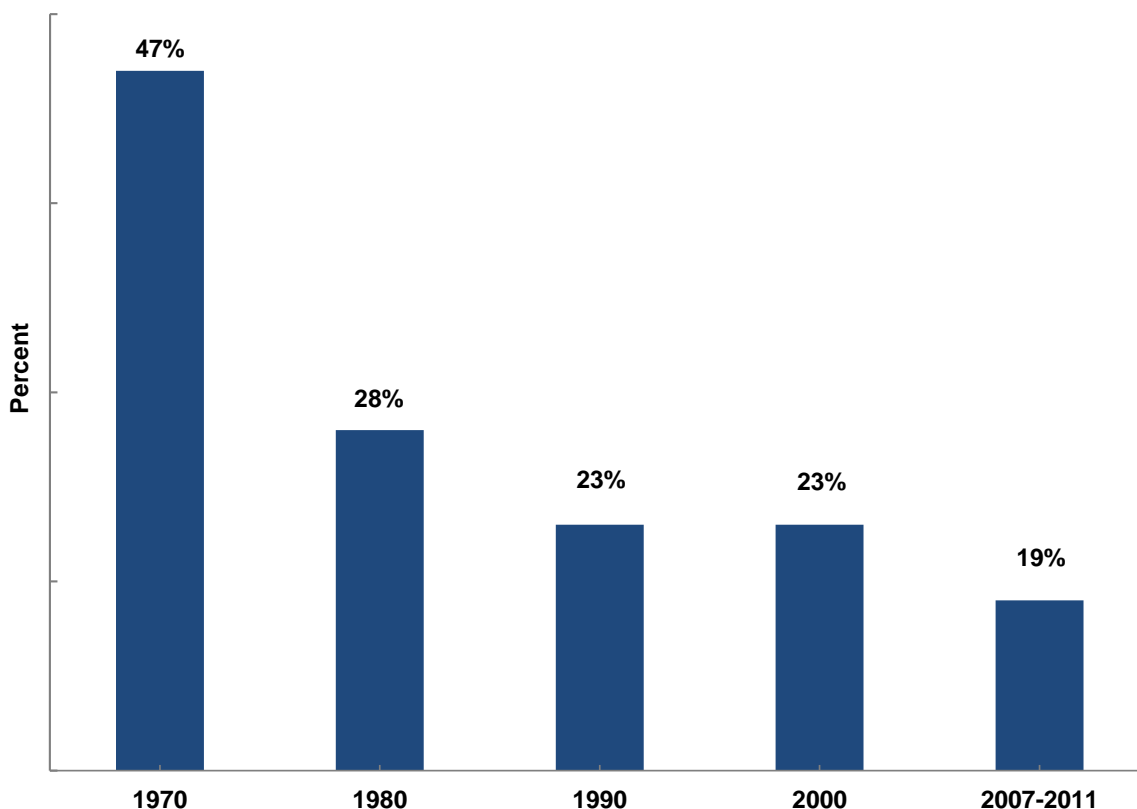
Living in the remote parts of the state off the road system is costlier still because of the high cost of transporting goods (and services). For example, the cost of living in rural communities in Alaska's Interior is about 31 percent higher than in Anchorage, while the cost of living in small villages in the state's Arctic region is 48 percent higher (McDowell Group 2009). The higher costs are exacerbated by the lack of year-round employment opportunities and lower money incomes

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in rural areas (Leask et al. 2001). Several of rural Alaska's predominant industries, particularly seafood harvesting and processing, tourism, construction, and timber, are highly seasonal and result in total employment for the summer exceeding that in the winter by at least 16 percent, or 50,000 (not counting the self-employed who are not fish harvesters) (Goldsmith 2010b). On the other hand, many rural Alaskans continue to secure subsistence harvests (e.g., hunt and fish), which substantially reduces their costs for food (Leask et al. 2001).

The PFD is particularly important in rural parts of the state (Goldsmith 2010a). As noted, rural households are cash poor, and subsistence harvests can fluctuate dramatically from year to year. Under these circumstances, the cash provided by the dividend is significant, not only because of its size, but also its predictability. Moreover, as an addition to the "safety net," the dividend has been one factor in the decline in the official poverty rate since Alaska attained statehood, particularly among Alaska Natives (Goldsmith 2010a). The Alaska Native poverty rate fell from 47 percent in 1970 to around 19 percent in more recent years (Figure 4-7).

Figure 4-7. Percentage of Alaska Natives Living Below the Poverty Line, 1970 to 2007-2011



Source: Adapted from Martin and Hill (2009). Additional data from Macartney et al. (2013)

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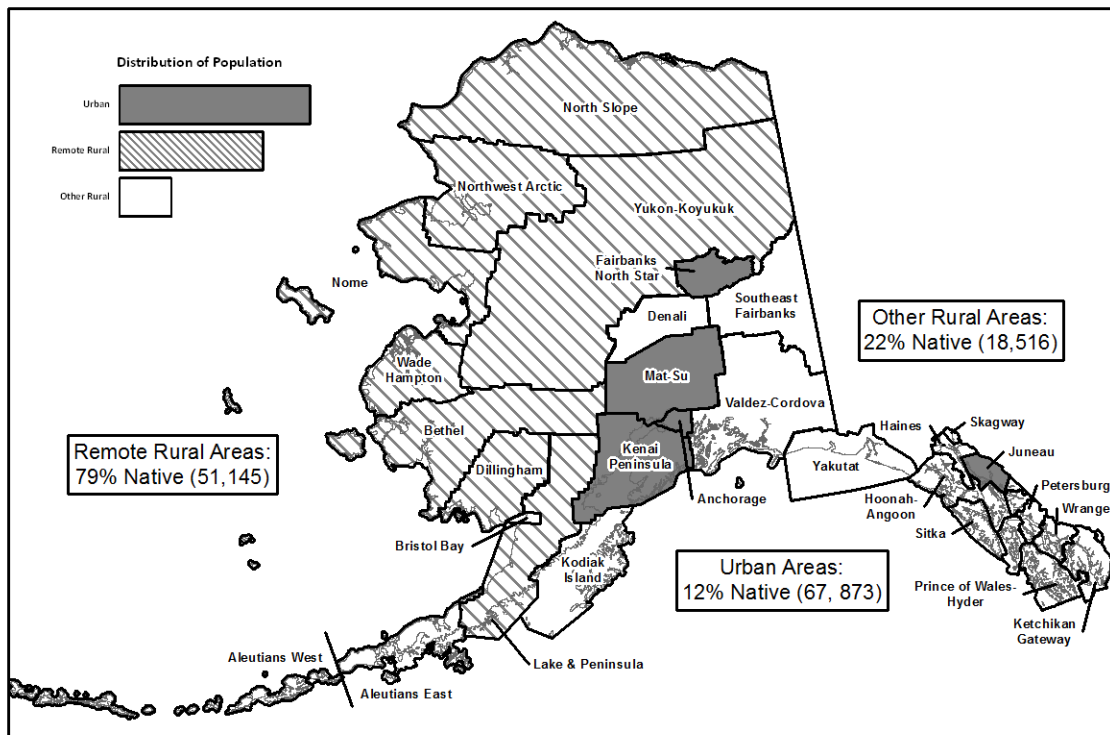
The Alaska Native population more than doubled between 1970 and 2010, from 50,801 to 104,871 (Martin and Hill 2009; U.S. Census Bureau 2014a).¹¹ That growth partly reflects improved healthcare for Alaska Natives in recent decades, which helped adults live longer and reduced infant mortality (Leask et al. 2001). As it did in 1970, Alaska has the highest share of indigenous Americans of any state (Martin and Hill 2009); by 2010, about one in five state residents reported they were American Indian/Alaska Native alone or in combination with another race. The percentage of Alaska Natives residing in large urban areas has steadily increased; about 26 percent of the Alaska Native population lived in Anchorage in 2010 (U.S. Census Bureau 2014a). The pursuit of economic and educational opportunities appears to be the predominant cause of migration to urban areas, but high fuel prices in rural areas may also be a factor (Martin et al. 2008).

Alaska Natives remain the majority population in remote rural areas, which Goldsmith (2008a) defines as areas of rural Alaska where most communities are small and far off the state's main road and ferry systems. As shown in Figure 4-8, in recent years, 37 percent of Alaska Natives lived in eight remote rural boroughs and census areas where they accounted for about 79 percent of the total population.

¹¹ The 2010 population estimate is the number of people who reported they were American Indian/Alaska Native and no other race. The number of people who reported they were American Indian / Alaska Native alone or in combination with another race could not be compared to the 1970 population estimate because the 1970 U.S. Census asked people to report only one race.

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Figure 4-8. Distribution of Alaska Native Population



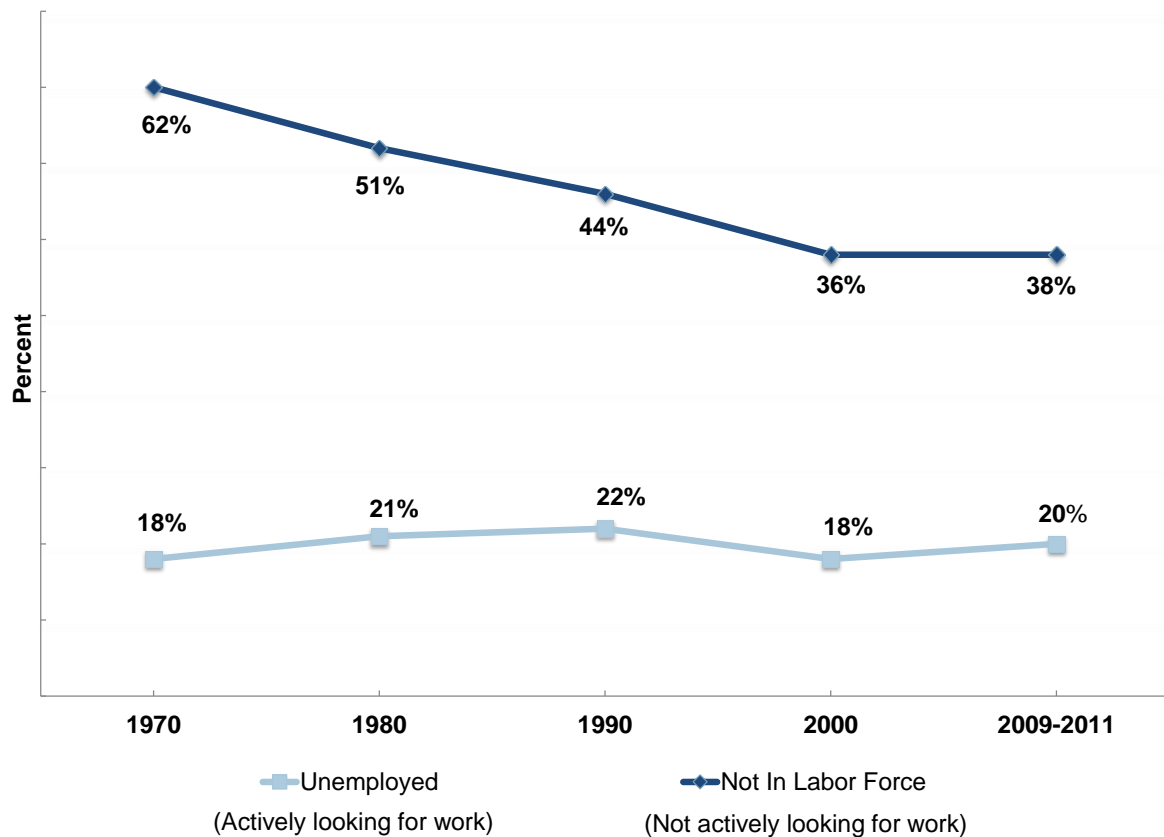
Notes: The population estimates are the number of people who reported they were American Indian/Alaska Native alone or in combination with another race.

Source: Adapted from Goldsmith et al. (2004). Data from U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates (2014b)

Alaska Natives are much more likely to have jobs and high school degrees today than they did in 1970 (Martin and Hill 2009). The percentage of Alaska Native adults not in the workforce has dropped from 62 percent to around 38 percent since 1970 (Figure 4-9). Alaska Native women in particular have moved into the workforce in the past several decades. In 1970, just over one-quarter of adult Native women had jobs; by 2000, that figure was approaching half (Martin and Hill 2009).

Trends in the economic condition of Alaska Natives have not been entirely positive though. While poverty among Alaska Natives is less than half what it was in 1970, Figure 4-9 shows that the major improvement was between 1970 and 1980. The percentage of Alaska Native people living below the federal poverty line has stayed around 23 percent since 1990. Moreover, even as numbers of Alaska Natives with jobs grew, so did unemployment (Figure 4-9). The recent unemployment rate is higher than it was in 1970 because the number of jobs has not increased as fast as the size of the workforce. A growing Alaska Native population means more people are looking for work. Additionally, some of those considered “not in the labor force” (because they are not actively looking for work) would like to have jobs, but are not looking because they live in small remote villages with few employment opportunities (Martin and Hill 2009).

Figure 4-9. Percentage of Alaska Native Adults (16 and Older) Unemployed or Not in Labor Force, 1970 to 2009-2011



Source: Adapted from Martin and Hill (2009). Additional data from U.S. Census Bureau (2014a)

4.2.8 Alaska Native Corporations and Western Alaska Community Development Quota Program

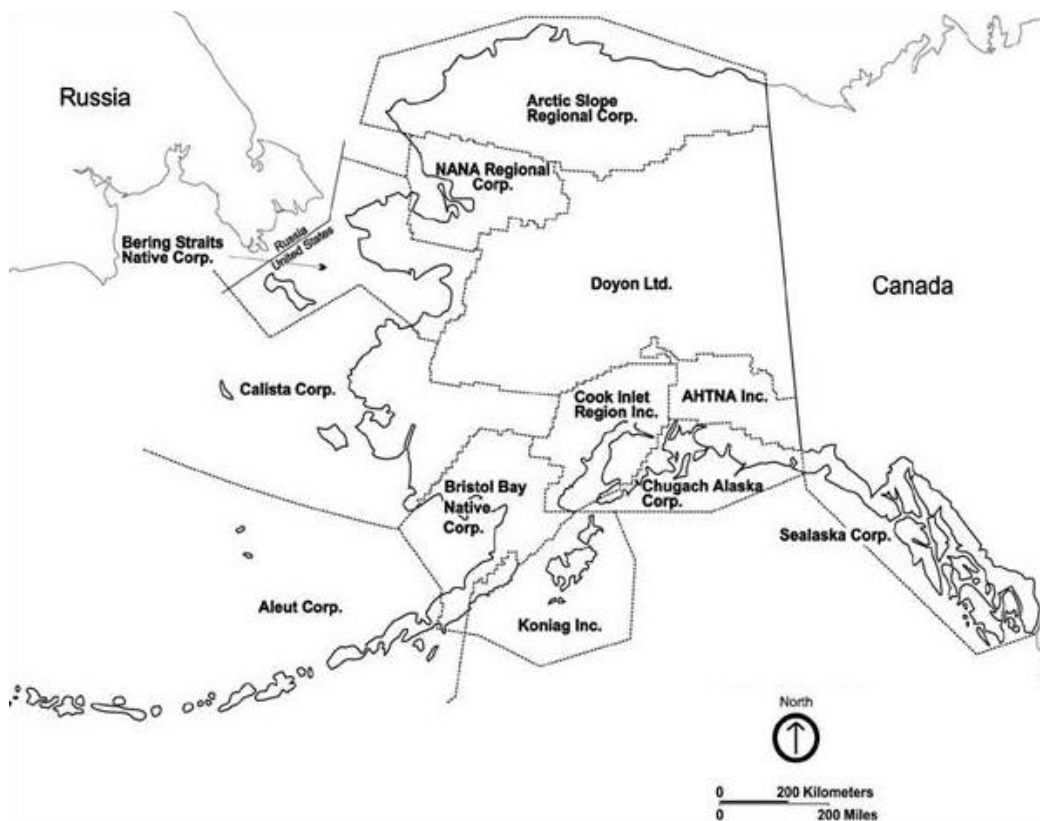
As noted in Section 4.2.5, Alaska's natural resource industries — including petroleum, commercial fishing, timber, travel, and mining — are characterized by enclave development that has generated limited backward linkages with in-state firms. Moreover, the resource production that drives the Alaska economy is still dominated by large companies headquartered outside of Alaska, much as it was four decades ago (Goldsmith 2010b). For example, the state's large oil and gas producers are multi-national corporations for which Alaska is only one of a portfolio of operating venues (IHS Global Insight 2010). In 2010, only one of the 49 largest Alaska-owned firms, Usibelli Coal Mine, Inc., was a producer of natural resources (Cutler 2011). As discussed in the following sections, the Alaska Native corporations created under ANCSA (Section 2.0) and the Western Alaska Community Development Quota (CDQ) Program established under the Magnuson-Stevens Fishery Conservation and Management Act have proven to be a partial solution to this issue.

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4.2.8.1 Alaska Native Corporations

Since their establishment in 1971, Alaska Native corporations (ANCSA corporations) have come to play a major role in Alaska's economy and an even more important role in their individual regions. One reason for this growing economic significance is that by their charter, the majority of ANCSA corporations have some motivation or incentive to take the long-term view regarding investments in Alaska (IHS Global Insight 2010). Many of them are free to invest their assets (which exceed \$4 billion currently) anywhere in the world, and they have done so aggressively (Goldsmith 2010b). Most ANCSA corporation stockholders, however, reside in Alaska, and their financial well-being is ultimately driven by the underlying health of the Alaska economy. Thus, ANCSA corporations have an incentive to direct a significant part of their assets into investments that will have a payoff in the medium to long term, an incentive that out-of-state investors may not share (IHS Global Insight 2010). Figure 4-10 shows the boundaries of the regional corporations created under ANCSA.

Figure 4-10. ANCSA Regional Corporations



By 2010, eight of the top 10 Alaska-owned firms, based on gross revenues, were ANCSA corporations (Cutler 2011). In recent years, a number of regional and village ANCSA corporations have become involved in Alaska's natural resource industries through subsidiaries of their parent companies. These have been largely in a supporting role in the petroleum sector in activities like oilfield services and drilling, but some of the companies are directly involved in the production of timber and seafood (as well as providing services to tourists) (Cutler 2010).

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ANCSA corporations have also formed partnerships with major resource development corporations. ANCSA corporations are the largest private landowners in Alaska, with title to 44 million acres of selected land throughout the state. Partnering with outside companies to develop the resources beneath these lands offers ANCSA corporations an opportunity to generate jobs and other economic benefits for their shareholders (Resource Development Council for Alaska 2014). For example, NANA, an ANCSA corporation owned by the Iñupiat of Northwest Alaska, negotiated an operating agreement with Teck Alaska, Inc., a U.S. subsidiary of Teck Resources Limited, to develop the Red Dog Mine, a zinc mine that accounted for approximately 49 percent of the total value of Alaska's mineral production in 2010 (Szumigala et al. 2011).

In addition, both regional ANCSA corporations and village ANCSA corporations are involved in the oil and gas industry. For example, as a result of its land entitlement under the ANCSA, Arctic Slope Regional Corporation (ASRC) owns nearly five million acres on the North Slope. ASRC's subsurface estate was selected for its natural resource potential, and major oil companies have leased, and are leasing, tracts of ASRC land throughout the region. For instance, ASRC owns a portion of the subsurface mineral rights under the Alpine oilfield operated by ConocoPhillips Alaska and is paid production royalties from the field (Arctic Slope Regional Corporation 2015). ASRC Energy Services, a wholly owned subsidiary of ASRC, performs an array of oilfield engineering, operations, maintenance, construction, fabrication, regulatory and permitting, and other services for some of the world's largest oil and gas companies. The company has emerged as one of Alaska's largest oilfield service providers and one of Alaska's largest private-sector employers (Fried 2011; Arctic Slope Regional Corporation 2014). Petro Star, Inc., another subsidiary of ASRC, is the only Alaskan-owned refining and fuel marketing operation in the state (Arctic Slope Regional Corporation 2014).¹²

Examples of village ANCSA corporations active in the oil and gas sector include the Ukpeagvik Iñupiat Corporation, the village corporation for Barrow, and Kuukpik Corporation, the village corporation for Nuiqsut (Bradner 2005). UMIAQ, LLC, a division of the Ukpeagvik Iñupiat Corporation, is an oilfield service company. Kuukpik Corporation and its partners (Kuukpik/Arctic Services, LLC, Kuukpik/LCMF, Kuukpik/Carlile Transportation, LLC, Kuukpik Drilling, LLC, Nanuq, Inc., and Kuukpik/NANA Management Services, LLC) are involved in various oil industry support services as well, including camp services and catering, transportation of materials and supplies; exploration, development and production drilling; and facility construction and maintenance. Moreover, Kuukpik Corporation owns the surface rights to portions of the Alpine oil field and receives a small royalty from the production of oil and gas (Kuukpik Corporation 2014).

It is also important to note that all ANCSA corporations benefit from ANCSA's natural resource revenue-sharing provision, which requires that 70 percent of all revenues received by each regional ANCSA corporation from timber and subsurface estate resources be divided among all 12 regional corporations in proportion to the number of Alaska Natives enrolled in each region. At least 50 percent of the revenues received must be redistributed among the village ANCSA corporations.

As a result of their various revenue-generating activities, ANCSA corporations are able to employ many Native (and non-Native) Alaskans. In 2008, the most recent year for which data were available, ANCSA regional corporations created 13,848 jobs in Alaska, with a combined payroll

¹² Other regional ANCSA corporations involved in the oilfield services industry include Bristol Bay Native Corporation; NANA; Ahna, Inc.; Calista Corporation; Chugach Alaska Corporation; Cook Inlet Region, Inc.; and Doyon, Ltd.

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of \$774 million (Hoffman and Orr 2010). Overall, the regional corporations employed 3,577 Alaska Natives, representing more than 10 percent of their total worldwide employment of 35,430.

In addition, non-profit ANCSA corporations now administer a number of federal health and social service programs for Alaska Natives. These non-profits provide employment opportunities in rural communities as well as essential services (Martin and Hill 2009).

4.2.8.2 Western Alaska Community Development Quota Program

The full development of domestic fishing and seafood processing sectors in the highly productive Bering Sea fisheries between 1976 and 1990 generated substantial wealth; however, little of that wealth flowed to the small, rural villages along the coast of western Alaska. While the communities bordered some of the richest fishing grounds in the world, the high capital investment required to compete in these large-scale, industrialized fisheries precluded small communities from participating in their development.

This concern provided part of the impetus behind the creation of the CDQ Program by the North Pacific Fishery Management Council in 1992 (National Research Council 1999). Initially, the CDQ Program set aside 7.5 percent of the Bering Sea/Aleutian Islands fishery management area's annual total allowable catch of pollock for allocation to qualifying communities. Over the years, the CDQ Program has expanded to include harvest allocations for a wide array of Alaska fisheries. Currently, 65 communities located along the Bering Sea are eligible for the CDQ Program. These communities are aligned into six CDQ groups: Aleutian Pribilof Island Community Development Association, Bristol Bay Economic Development Corporation, Central Bering Sea Fishermen's Association, Coastal Villages Regional Fund, Norton Sound Economic Development Corporation, and Yukon Delta Fisheries Development Association.

By 2010, the six CDQ groups reported a cumulative \$210.9 million in gross revenue, with net income of \$33.2 million (Jensen 2011). Initially, program revenues were from royalties obtained from leases of CDQ Program catch allocations. Eventually, this revenue stream permitted the CDQ groups to make substantial fisheries-related investments, including acquiring ownership interests in large fishing vessels and shore-side seafood processing plants. The value of CDQ group assets in aggregate increased from about \$13.3 million in 1992, to nearly \$737 million in 2010 (Northern Economics 2009; Jensen 2011). In addition, some CDQ groups have promoted investment in local, small-scale fishing operations targeting salmon, herring, halibut, or other species. In 2004, CDQ earned-income exceeded royalty revenues for the first time in program history, and earned-income doubled royalty revenues in 2005 (Southwest Alaska Municipal Conference 2007).

The creation of employment opportunities for residents of participating communities has been one of the most tangible direct benefits of the CDQ Program. Jobs generated by the CDQ Program include work aboard harvesting vessels, internships with fishing industry partners or government agencies, work at processing plants, and management/administrative positions.

Finally, the Alaska Department of Commerce, Community, and Economic Development (2002) notes that an important effect of the CDQ Program has been its "Alaskanizing" influence on the state's seafood industry. While Bering Sea groundfish and crab fisheries continue to be dominated by Seattle-based companies, no other mechanism has been as successful as the CDQ Program in promoting involvement of Alaskans in those fisheries.

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5.0 SUMMARY

This section examines socioeconomic differences and similarities between Alaska in 1970 and 2010, and compares selected socioeconomic characteristics of Alaska and the U.S. Table 5-1 presents the comparative statistics.

Table 5-1. Demographic and Economic Characteristics of Alaska and the United States, 1970 and 2010

Socioeconomic Characteristic		1970	2010							
		Alaska	Alaska		United States					
Population (000s)		308.5	710.2		308,745.5					
Male population (%)		54.3	52.0		49.2					
Alaska Native/American Indian population (%) ¹		17.0	14.8		0.9					
Median age of population		22.9	33.8		37.2					
Population that moved from another state within the last 5 years (%)		44.0	18.7 ²		11.3 ²					
Total (non-farm) employment (000s)		93.1								
Industry ³	1970			2010						
	Gross Product	Employment	Earnings	Gross Product		Employment		Earnings		
	(Percent of Total)			(Percent of Total)						
	Alaska			Alaska ^a	U.S.	Alaska	U.S.	Alaska	U.S.	
Mining (excluding oil and gas extraction)	0.3	2.2	3.8	2.4	0.4	0.9	0.1	1.3	0.2	
Oil and gas extraction	14.2	N/A	N/A	17.3	1.1	1.0	0.4	3.6	0.4	
Construction	9.6	5.6	11.2	4.1	3.6	5.4	5.1	6.7	4.5	
Manufacturing	5.8	5.5	6.6	3.1	11.2	3.4	7.0	2.9	10.6	
Trade	10.4	12.3	11.4	6.2	11.5	11.5	13.6	7.9	11.8	
Transportation and warehousing	9.5	6.6	8.8	11.0	2.9	5.1	3.2	6.4	3.1	
Finance, insurance, and real estate	10.0	3.8	2.7	12.5	20.8	6.3	9.8	4.3	9.0	
Professional, scientific, and technical services	5.9	11.1	8.3	4.3	12.2	5.4	6.8	5.3	9.3	
Health care and social assistance	1.7	1.6	1.9	5.9	7.6	10.5	11.0	10.1	11.5	
Government and government enterprises	30.7	48.3	43.1	18.9	13.6	24.4	14.3	32.8	18.4	
Other sectors	1.9	3.0	2.2	14.3	15.1	26.2	28.7	18.8	21.2	

¹ The estimates include only persons who reported they are American Indian/Alaska Native alone.

² Population mobility estimate is for 2000, the most recent year for which data were available.

³ Industry groupings were adjusted to account for differences between the U.S. Standard Industrial Classification system and North American Industrial Classification System.

Source: Adapted from Carrington (1996). Additional data from U.S. Department of Commerce, Bureau of Economic Analysis (2013b) and U.S. Census Bureau (2014a)

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Despite Alaska's population growth over the past four decades, only three states have a smaller population than Alaska. The small population means that the local market has remained small, which contributes to persistent higher prices for consumers and a higher cost of living. Moreover, the small population limits the size of the labor market and the range of expertise. Alaska's population is still disproportionately male, but it more closely resembles the U.S. gender composition. The population has also aged substantially, with a median age of 33.8 in 2010 versus 22.9 in 1970. Evidence that Alaska's aging skilled workforce could create labor shortages, particularly in high-demand occupations, has led to recent state and industry initiatives to prepare and improve Alaska's workforce. While the state's population is more stable than it was four decades ago, there is still a fairly high level of turnover. Alaska ranks fourth among the states in the share of population recently moving into the state (Goldsmith 2010b).

As Alaska's economy has matured and diversified, it appears to have moved out of the boom-and-bust cycles of the past. Relatively new industries such as tourism and transportation have expanded, and the state's workforce has increased more than threefold over the past four decades. Moreover, as a young state with a relatively small population, Alaska had for years been underserved by consumer goods and service industries, such as retail and healthcare, until development of those sectors occurred in the 1990s (Fried 2007; Fried and Robinson 2008). Although no good measure of this "import-substitution" effect exists, there is little doubt that a dollar spent in Alaska's economy today remains in the economy longer (Fried 2007).

On the other hand, the economy still depends heavily on federal and state government spending and on a few natural resource industries, just as it did in 1970. Petroleum is the dominant natural resource and accounts for about 17 percent of the state's gross product. Although the oil and gas industry generates little direct employment, the indirect employment effects are huge. As discussed above, about a third of all jobs in Alaska can be attributed to oil, directly or indirectly. In addition, two legacies of the state's oil revenues, the Permanent Fund and CBRF, have helped transform a temporary resource into permanent assets that help stabilize the economy (Leask et al. 2006; Fried 2007).

It is also noteworthy that Alaska's reliance on the oil industry and government helped the state weather the global recession of 2009 much better than the rest of the country. Oil prices remained high, supporting state revenues and employment, and government jobs tend not to have the volatility of those in other sectors of the economy (Forgey 2010). More recently, however, the state has seen growing budget deficits as revenues fall due to the continuing decline in oil production and lower oil prices (Bradner and Bradner 2013).

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APPENDIX C TECHNICAL MEMORANDUM, LONG-TERM MODELING ASSUMPTIONS

TO BE PROVIDED IN A SUBSEQUENT DRAFT OF THIS RESOURCE REPORT

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APPENDIX D SUBSISTENCE AND TRADITIONAL KNOWLEDGE DRAFT EXISTING DATA COMPILATION REPORT

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APPENDIX E HEALTH IMPACT ASSESSMENT

TO BE PROVIDED IN A SUBSEQUENT DRAFT OF THIS RESOURCE REPORT