ALASKA
PipelineProject

Draft Resource Report 5 – Rev 0
Socioeconomics

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TransCanada ExxonMobil

DRAFT

Notes:

Yellow highlighting is used throughout this draft Resource Report to highlight selected information that is pending or subject to change in the final report.

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ACRONYMS AND ABBREVIATIONS

§	Section
ADCCED	Alaska Department of Commerce, Community and Economic Development
ADOLWD	Alaska Department of Labor and Workforce Development
ADOTPF	Alaska Department of Transportation and Public Facilities
AIA	Ted Stevens Anchorage International Airport
AMP	Alaska Mainline milepost
ANCSA	Alaska Native Claims Settlement Act
ANGPA	Alaska Natural Gas Pipeline Act of 2004
ANILCA	Alaska National Interest Lands Conservation Act
ANS	Alaska North Slope
APP	Alaska Pipeline Project
ARRC	Alaska Railroad Corporation
ATWS	additional temporary workspace
bscfd	billion standard cubic feet per day (standard conditions: 14.73 pounds per square inch absolute and 60º Fahrenheit)
CPCN	Certificate of Public Convenience and Necessity
C.F.R.	Code of Federal Regulations
CGF	Central Gas Facility
ESAL	equivalent single-axle loads
FERC	U.S. Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
GTP	Gas Treatment Plant
MLBV	mainline block valve
N/A	not applicable
NGA	Natural Gas Act
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
PBU	Prudhoe Bay Unit
PMP	Point Thomson Gas Transmission Pipeline milepost
PT Pipeline	Point Thomson Gas Transmission Pipeline
PTU	Point Thomson Unit
REMI	Regional Economic Models Incorporated
RFFA	Reasonably Foreseeable Future Action
RR	Resource Report
TAPS	Trans-Alaska Pipeline System
UMC	Unalaska Marine Center
VPSO	Village Public Safety Officer

5.0 RESOURCE REPORT 5 – SOCIOECONOMICS

The location information, facility descriptions, resource data, construction methods, and mitigation measures presented in this report are preliminary and subject to change. APP is conducting engineering studies, environmental resource surveys, agency consultations, and stakeholder outreach efforts to further refine and define the details of the Project.

The Project described in this resource report is being designed and developed based on estimated volumes of natural gas from projected shipper commitments. If final shipper commitments are significantly different from those estimated, the Project may be adjusted accordingly.

5.1 PROJECT OVERVIEW

TransCanada Alaska Company, LLC and Foothills Pipe Lines Ltd., working with ExxonMobil Alaska Midstream Gas Investments LLC, are developing a joint project to treat, transport, and deliver natural gas from the Alaska North Slope (ANS) to pipeline facilities in Alberta, Canada for markets in the contiguous United States and North America. This joint project is referred to as the Alaska Pipeline Project (APP or Project)[1].

As required by Title 18 Code of Federal Regulations (C.F.R.) Section (§) 380.12 and consistent with the Alaska Natural Gas Pipeline Act of 2004 (ANGPA), APP has prepared this draft resource report in support of its application to the U.S. Federal Energy Regulatory Commission (FERC) for a Certificate of Public Convenience and Necessity (CPCN) under Section 7(c) of the Natural Gas Act (NGA) to construct, own, and operate the portion of the Project in Alaska. This draft resource report pertains only to that portion of the Project in Alaska, and unless the context otherwise requires, references in this draft resource report to APP refer only to the Alaska portion of the Project[2].

As shown in Figure 1.1-1, APP will comprise the following major components[3,4]:

- The Point Thomson Gas Transmission Pipeline (PT Pipeline)[5], consisting of approximately 58.4 miles of buried 32-inch-diameter pipeline from the Point Thomson Unit (PTU) to an APP Gas Treatment Plant (GTP) and associated facilities near Prudhoe Bay;

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1 Depending on the context, the term APP refers to the joint project or, collectively, to the sponsoring entities.

2 The Canadian Section refers to the portion of the Project from the Yukon border to the pipeline facilities in Alberta, Canada.

3 In previous FERC filings, the Point Thomson Gas Transmission Pipeline was referred to as Zone 1, the Gas Treatment Plant was referred to as Zone 2, and the Alaska Mainline was referred to as Zone 3 of the Alaska-Canada Pipeline.

4 As part of the Project, APP proposes to construct compressor stations, meter stations, various mainline block valves, pig launcher and receiver facilities, as well as associated ancillary and auxiliary infrastructure, including additional temporary workspace, access roads, helipads, construction camps, pipe storage areas, contractor yards, borrow sites, and dock modifications at Prudhoe Bay.

5 The origin of the PT Pipeline is assumed to be located at an outlet from the PTU. The final length may vary depending on the final gas development plan for the PTU.

- The GTP, which will have the capacity to process gas received from the Point Thomson Unit and the existing Central Gas Facility (CGF) on the Prudhoe Bay Unit (PBU) in order to deliver an annual average capacity up to 4.5 billion standard cubic feet per day (bscfd) (standard conditions: 14.73 pounds per square inch absolute and 60º Fahrenheit) of sales quality gas; and
- The Alaska Mainline, consisting of approximately 745.1 miles of 48-inch-diameter pipeline, all of which is buried except as otherwise described in this Resource Report. The Alaska Mainline extends from the GTP to the Alaska-Yukon border east of Tok, Alaska, and includes provisions for intermediate gas delivery points within Alaska.

Table 5.1-1 lists the FERC's filing requirements and additional information applicable to Resource Report 5 taken from FERC's Guidance Manual for Environmental Report Preparation. Alaska differs from other states in ways that are important to an examination of socioeconomic interests. Accordingly, some sections of this Resource Report may depart from filings by other applicants in order to identify and address the issues unique to this state and this Project.

TABLE 5.1-1

Alaska Pipeline Project
Resource Report 5 Filing Requirements Checklist

Requirement	Where Found in Document
FERC REQUIREMENTS FROM 18 C.F.R. § 380.12	
1. For major aboveground facilities and major pipeline projects that require an EIS describe existing socioeconomic conditions within the project area. (§ 380.12[g][1])	Sections 5.1 and 5.2
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, (§ 380.12[g][2-6])	Section 5.5
OTHER INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS PER FERC'S GUIDANCE MANUAL FOR ENVIRONMENTAL REPORT PREPARATION	
• Evaluate the impact of any substantial immigration of people on governmental facilities and services and describe plans to reduce the impact on local infrastructure. (§ 380.12[g][2])	Section 5.5.4
• Describe on-site manpower requirements including the number of construction personnel who currently reside within the impact area that would commute daily to the site from outside the impact area, or would relocate temporarily within the impact area. (§ 380.12[g][3])	Sections 5.5.1 and 5.5.2
• Estimate total worker payroll and material purchases during construction and operation.	Section 5.5.2
• Determine whether existing housing within the impact area is sufficient to meet the needs of the additional population. (§ 380.12[g][4])	Section 5.5.3
• 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. (§ 380.12[g][5])	Sections 5.5.2 and 5.5.3
• 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. (§ 380.12[g][6])	Sections 5.5.4, 5.5.5 and 5.5.6
• Provide a study of project construction and operation impacts on subsistence suitable for supporting an ANILCA 810 determination. This study must be based on current (new) subsistence data (not the data used for the 2002 Trans-Alaska Pipeline System Right-of-Way renewal)[a]	Appendix 5E
• Provide a Health Impact Assessment which describes potential health-related impacts of project construction and operation on stakeholders (Alaska Natives and other residents) in the regions planned to be crossed by the pipeline. Include all related project components..	To be filed separately in October 2012

TABLE 5.1-1

Alaska Pipeline Project
Resource Report 5 Filing Requirements Checklist

Requirement	Where Found in Document
• Provide additional information, as necessary, to assess environmental justice issues. In particular, discuss specific segments that diverge from the established TAPS corridor.	Section 5.5.7

[a] Subsistence Requirement checklist can be found in Appendix 5E.

Mileposts (MPs) are commonly used markers along linear projects, such as APP. Where necessary to distinguish the PT Pipeline from the Alaska Mainline, APP has prefixed its MP identifier with a PT Pipeline MP (PMP) or an Alaska Mainline MP (AMP). This convention is used in APP's application and supporting maps and alignment sheets (refer to Appendix 1O of Resource Report 1) to identify resources and features along the respective pipeline routes.

The purpose of Resource Report 5 is to describe the existing socioeconomic conditions associated with the Project area[6] and quantify the impacts of the Project on relevant socioeconomic factors.

5.2 SOCIOECONOMIC STUDY AREA

The analysis in this report focuses primarily on two categories of affected communities – those communities that will be affected because they are in or near the pipeline corridor and those communities that will be affected because they serve as transportation corridors.

As shown in Figure 5.2-1, the Project's natural gas pipeline will traverse the North Slope Borough, Yukon-Koyukuk Census Area, Fairbanks North Star Borough, and Southeast Fairbanks Census Area. Many of the direct socioeconomic effects of the Project will occur in the communities located in or near this pipeline corridor. The pipeline corridor communities were identified based on information provided on the APP website and other sources (e.g., U.S. Department of the Interior 2002; Information Insights 2004). The list of communities may change as additional information becomes available. Most of the potential effects to pipeline corridor communities will occur during the construction phase 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 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 by the GTP and pipeline.

Direct effects during the construction phase of the Project will also occur in communities outside the pipeline corridor due to materials and equipment that will be moved 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

[6] The terms "Project area" and "Project footprint" are defined to include the project facilities and land requirements for construction and operation. The term "Project vicinity" is used to mean the area or region near or surrounding the Project area, and is subject to the context in which the term is used.

of normal traffic patterns. These transportation effects would be concentrated in specific communities in the Denali Borough, Fairbanks North Star Borough, Municipality of Haines Borough, Matanuska-Susitna Borough, Kenai Peninsula Borough, Valdez-Cordova Census Area, Municipality of Anchorage and Municipality of Skagway Borough.

Moreover, communities outside the pipeline corridor will likely experience socioeconomic effects from the construction and operation of the Project, including population and economic growth. These effects 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.

For the purposes of the socioeconomic analysis, the region encompassing the communities in the pipeline corridor and along the major Project transportation routes is referred to as the "immediate region of influence" for the Project. Communities in the immediate region of influence are grouped according to whether they are inside or outside the pipeline corridor. The demographic and economic characteristics of each community in the immediate region of influence are provided in Appendix 5A.

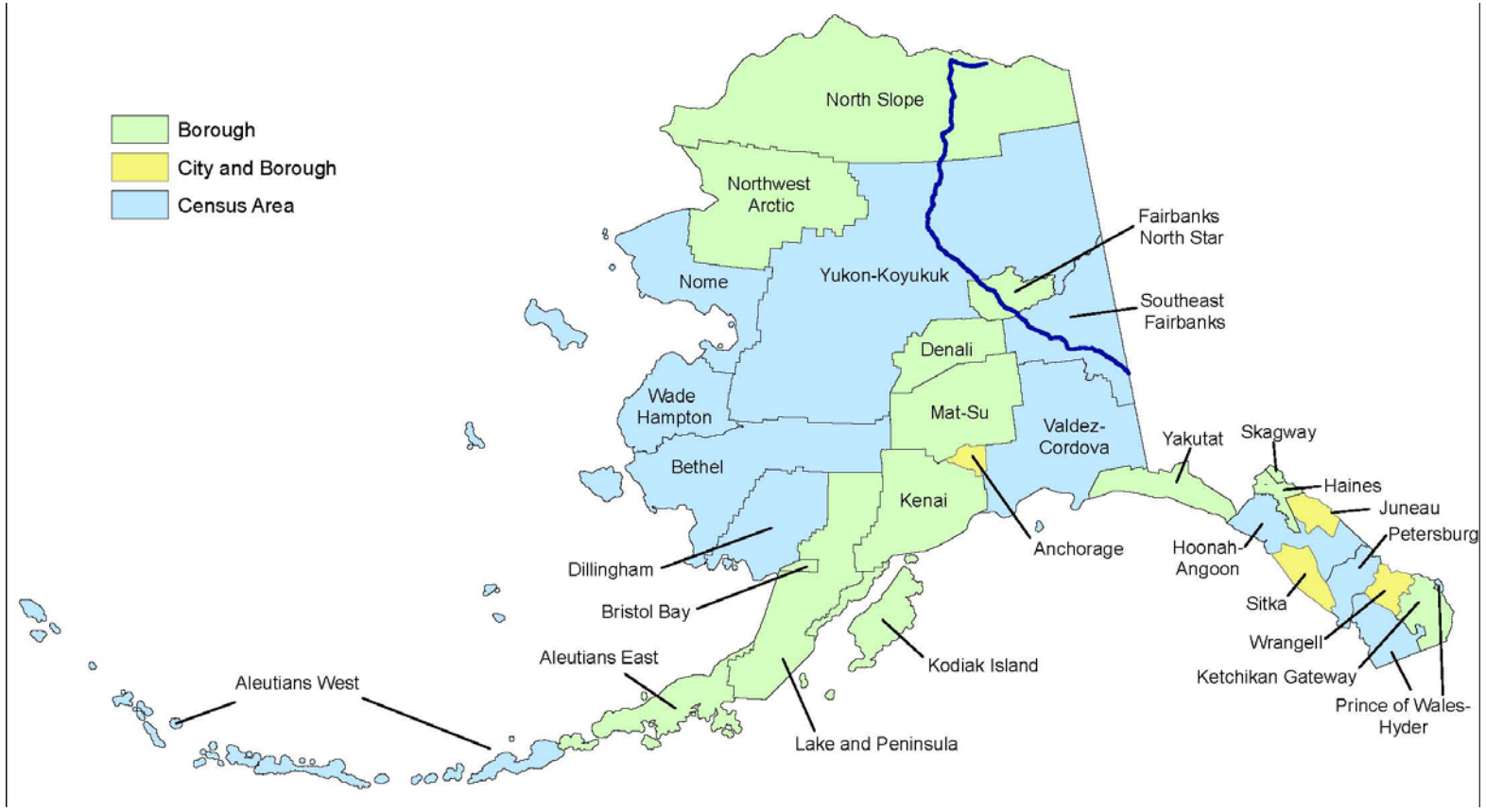
In addition, given the scale of the Project and its potential importance to the Alaska economy, the socioeconomic effects of the Project would also be experienced throughout the state. These statewide effects would include employment and fiscal effects.

The socioeconomic effects analysis covers the development, construction and operations phases of the Project, which are defined below.

- Development phase. The term "development" as used here includes all procurement and pre-construction activities such as design and engineering, permitting, and other activities that will take place prior to full funding of the Project.
- Construction phase. The construction phase will extend from the date when full funding is approved to the end of post-construction activities (e.g., equipment demobilization).
- Operations phase. The Trans-Alaska Pipeline System (TAPS) was originally authorized to operate for 30 years. Assuming a similar period for the Project would nominally suggest that the temporal period for the operations phase would extend to 2050.

For purposes of this report the development phase is assumed to be conducted in years 2011 through 2014, construction phase from 2015 through 2021 which includes schedule contingency and operations from first gas in late 2020 through 2050. The timing for these phases may change as new project information becomes available. The final Project schedule will be influenced by commercial, business, and other factors, and thus the timing for specific Project activities, including commencement of construction and operations (start-up), may extend beyond the dates shown in this preliminary Project schedule. Refer to Section 1.5 of RR1 for further schedule information.

Additional information on the geographic and temporal scope of the socioeconomic effects analysis can be found in Appendix 5B.



Source: Adapted from Alaska Department of Labor and Workforce Development (2010).

Figure 5.2-1

Alaska Borough and Census Area Boundaries

5.3 BASELINE SPECIFICATION AND MODEL ASSUMPTIONS

Other human-induced events would affect Alaska's economy even if the Project was not undertaken. The impact analysis of the "No Action Alternative" included in Resource Report 5 is a description of how socioeconomic conditions are likely to change in the future without the Project. This trajectory of socioeconomic conditions provides a baseline for assessing the Project's incremental effects. The No Action Alternative is assessed for the same analysis timeframe (i.e., present to 2050) as the Project.

The forecast of socioeconomic conditions with and without the Project is based in part on estimates derived from a data and software program called REMI (Regional Economic Models, Inc.). The REMI model incorporates aspects of four major modeling approaches: input-output, general equilibrium, econometric, and economic geography. Changes in supply, demand and prices are entered into the REMI model in order to identify the iterative economic and demographic effects of these changes. While the REMI model provides a wide range of output variables, the variables of interest in the socioeconomic impact analysis are population, employment, labor income, output, and housing. The REMI model extends economic and demographic forecasts through 2050, which is consistent with the timeframe of the temporal scope of the socioeconomic impact analysis.

The forecast analysis performed by the REMI model was guided by a set of model assumptions and reasonably foreseeable future actions (RFFAs) summarized in Appendix 5D that are predicted to occur with and without the Project. Actions were included as RFFAs if they are considered likely to occur, can be adequately described, and would have an important and measurable socioeconomic effect. The model assumptions and RFFAs are the result of an information collection process aimed at deriving a consensus for a possible economic future for Alaska. The model assumptions and RFFAs reflect the combined information from published reports, project proponents, statements from industry and government representatives, and opinions from stakeholders. In addition to a thorough review of published reports, the study team interviewed more than 30 Alaskan stakeholders with experience and expertise in the state's leading industries and policy areas. Northern Economics, Inc. was responsible for assessing the likelihood of the future outcomes identified by these sources and compiling the information into the assumptions. The model assumptions and RFFAs with and without the Project are summarized below.

Under the No Action Alternative, it is assumed the major economic drivers in the state would continue to be resource extraction (primarily oil and gas and minerals) and government. While North Slope oil production from currently producing onshore fields is expected to continue to decline through 2021, increasing condensate production at Point Thomson and future Outer Continental Shelf (OCS) development is likely to spur the investments in TAPS necessary to keep the pipeline operating. OCS oil production is predicted to begin in 2024 from the Beaufort Sea and in 2028 from the Chukchi Sea. In Cook Inlet, natural gas production is anticipated to continue to decline, and, consequently, local utilities would seek diversity in their energy supplies. The predicted development of the Donlin Gold mine in the Bethel Census Area, the Livengood mine in the Yukon-Koyukuk Census Area, and the Pebble mine in the Lake and Peninsula Borough would increase mineral production in the state. Federal and military spending in Alaska is expected to decline on a per-capita basis to historical inflation-adjusted averages and then increase at the inflation rate through 2050.

All of the above actions are also expected to occur if the Project is constructed. In addition, the Project is expected to have a number of indirect impacts on Alaska's economy, which, in turn, would affect the state's demographic and economic characteristics. Most notably, the ability to transport any gas discoveries via the Project would likely encourage increased oil exploration and production on the North Slope. Production from previously marginal or sub-economic oil fields would likely begin in 2021 and increase the state's onshore oil production levels. The increased oil production would generate greater revenues for the state government. As a result, additional public infrastructure improvements would be economically feasible, which could result in state infrastructure expansion. In addition, the natural gas made available by the Project is expected to stimulate private investment in economic development projects in Alaska.

5.4 STATE DEMOGRAPHIC, ECONOMIC AND FISCAL OVERVIEW

TAPS was constructed almost forty years ago. When peak construction occurred from 1975 to 1976, Alaska had a small population and modest economy. As a result of these and other factors, TAPS's construction impacts, especially the effects on the socioeconomic environment, were substantial. The sections below provide an overview of current socioeconomic conditions in the state. These conditions include a larger population and more robust economy than what existed during the TAPS construction era. More detailed socioeconomic information about Alaska can be found in Appendix 5C.

5.4.1 POPULATION

In the nearly four decades since construction of TAPS, Alaska's population and economy have grown substantially. Alaska's pre-TAPS population – 302,603 in 1970 – has more than doubled to an estimated 710,231 as of 2010. The state's economy and workforce have grown correspondingly. From 1988 to 2009, more people were employed each year than the previous year, which made for the longest period of uninterrupted employment growth in the state's history (Fried et al. 2011).

U.S. Census Bureau data and other sources indicate that in addition to being much larger, Alaska's population has changed over the past three to four decades in other ways, including the following:

- **More diverse.** Alaskans have become more ethnically diverse, especially in urban areas (Leask et al. 2006). For example, Caucasians accounted for 87.2 percent of Anchorage's population in 1970, but 72.8 percent in 2010.
- **More stable**. The share of residents who had been in Alaska at least 5 years grew from 56 percent in 1970 to around 81 percent by 2000, the most recent year for which data were available.
- **Aging.** Alaskans' median age was 22.9 in 1970 and 33.8 in 2010.
- **More gender balanced.** The population was 54.3 percent male in 1970; by 2010, it was 52.0 percent male.
- **More concentrated.** Alaskans have become increasingly concentrated in the state's Southcentral region, which includes Anchorage, the Matanuska-Susitna Borough, and the Kenai Peninsula Borough, because the boroughs to the north and south of Anchorage grew so fast in recent decades (Leask et al. 2006). In 1970, Southcentral

Alaska 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 – Southcentral Alaska 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 by far the least densely populated state (Goldsmith 2010b). The State's small population means a lack of competition still exists 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).

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).

5.4.2 ECONOMIC DRIVERS

By far, petroleum (oil) production 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;
- 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); and
- Similarly, approximately one-third of all jobs can be traced to the oil industry, even though only about 3 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 annual North Slope crude oil production by volume has declined to less than a third of its 1988 peak. The value of crude oil production, however, is determined not only by production volume, but also by price. Because of volatility in the crude oil price, 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 East Asia spiraled into crisis, cutting oil demand. Just 10 years later, however, oil prices reached a record high.

The wealth from North Slope oil production and the local availability of petroleum products have also given "non-oil" economic drivers a boost. Low taxes and high public spending on both

operations and infrastructure have provided the tourism, fishing, mining, and air cargo industries with growth opportunities they would not otherwise have had (Goldsmith 2007).

The federal government also has long played an important economic role in Alaska. In particular, 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 growth (Goldsmith 2008b). Until 1996, per capita federal spending in Alaska was approximately 38 percent above the national average; by 2008 it was 71 percent higher (Goldsmith 2008b). 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).

Other factors have also contributed to the expansion of economic drivers. 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 quantity of commercial fishery landings since 1997 (National Oceanic and Atmospheric Administration [NOAA] Fisheries Service 2009). In the 1990s, over-capitalization and competition from farmed salmon from Norway and Chile severely eroded profits in Alaska's salmon fisheries; however, the economic condition of the salmon fisheries has improved in recent years due to larger harvests and modest increases in salmon prices.

Since the 1990s, tourism has been one of the fastest growing contributors to the state's economy. The number of visitors climbed from 39,000 in 1961 to 1.6 million in 2009 (Leask et al. 2001; McDowell Group 2009b). In particular, cruise ship passenger volumes in Alaska began to accelerate in the late 1990s as cruises became more affordable. 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 the businesses operating in the tourist industry, such as restaurants, hotels, and sightseeing businesses (Goldsmith 2010b).

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 $1 billion in 2003 to more than $3 billion in 2007 due largely to higher prices rather than changes to production amounts (Fried and Robinson 2008; Hughes et al. 2010). 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).

Alaska's air cargo transshipment industry is an economic driver that has developed largely since statehood. Among the advantages of Ted Stevens Anchorage International Airport (AIA) 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). In 2009, this airport was one of largest in the United States in terms of the amount of cargo handled, second only to Memphis International Airport (and had the sixth highest amount of cargo of any airport in the world) (Airports Council International 2011).

5.4.3 STATE REVENUES AND EXPENDITURES

The fiscal health of Alaska is closely tied to the fortunes of the oil industry in the state. For over two decades, about 80 percent of Alaska's unrestricted general fund revenue has come from oil taxation. Today, revenue from oil production continues to dominate the state's revenue picture, providing close to 89 percent of the general fund unrestricted revenue in Fiscal Year 2009 (Alaska Department of Revenue 2009). Oil revenues for the state general fund are generated from various taxes collected from the oil industry, including a severance tax based on the value of oil produced; property taxes; income taxes; and royalties, bonuses, and lease payments based on the value of oil production on state land. The balance of general fund revenues comes from corporate income taxes, fees, and licenses. Currently, Alaska does not have a personal income or statewide sales tax. A summary of state revenues sources for 2008 through 2010 is shown in Table 5.4.3-1.

As noted above, Alaska's oil production has been in decline, and oil prices have been volatile. After climbing to 300 percent of the national average in 1985, Alaska's combined state and local government per-resident spending had dropped back to about 150 percent of the U.S. average by 1999, about the same as in 1965 (Leask et al. 2001). The Alaska legislature has prevented wide swings in state expenditures by tapping the Constitutional Budget Reserve Fund (Fried 2007). Established in 1990, the Constitutional Budget Reserve Fund has served the state well as a budget stabilization fund in years of low oil revenue (Alaska Department of Revenue 2009).

Public expenditures per capita have fallen since 1990 as population growth in the state 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 the harsh climate, low population density, and the inaccessibility of many communities make the services provided by state agencies very costly (U.S. Department of the Interior 2002). The largest components of state government expenditures are education and health and human services, which grew by 68 percent between 2002 and 2010 and in 2010 constituted 46 percent of total governmental activities expenses (Alaska Department of Administration 2010). State general fund expenditures for 2008 through 2010 are summarized in Table 5.4.3-2.

TABLE 5.4.3-1

State General Fund Revenues by Source, 2008-2010

State General Fund Revenues	Amount (in $ millions) 2010	2009	2008
Petroleum Revenue			
Property Tax	118.80	111.20	81.50
Corporate Petroleum Income Tax	493.70	528.60	996.90
Severance Tax	2,860.50	3,537.00	6,870.60
Mineral Bonuses and Rents	9.10	12.40	11.60
Oil and Gas Royalties	1,523.00	1,535.30	2,473.50
Total Petroleum Revenue	**5,005.10**	**5,724.50**	**10,434.10**
Non-Petroleum Revenue			
Taxes	105.90	134.50	308.20
Licenses and Permits	114.00	114.00	114.70
Charges for Services	163.90	175.70	178.80
Fines and Forfeitures	14.60	13.70	18.50
Rents and Royalties	15.90	12.10	3.90
Interest and Investment Income/(Loss)	925.10	(145.20)	446.10
Other Revenue	64.10	67.20	144.40
Total Non-Petroleum Revenue	**1,403.50**	**372.00**	**1,214.60**
Federal Revenue			
Total Federal Funds	**2,394.10**	**2,088.40**	**1,897.30**
Total State General Fund Revenues	**8,802.70**	**8,184.90**	**13,546.00**

Source: State of Alaska Comprehensive Annual Financial Report FY 2008, 2009 and 2010.

TABLE 5.4.3-2

State General Fund Expenditures by Use, 2008-2010

State General Fund Expenditures	Amount (in $ millions) 2010	2009	2008
Current			
General Government	365.07	677.54	516.38
AK Permanent Fund Dividend	817.16	2,015.97	990.38
Education	1,669.47	1,614.89	1,677.12
University	402.85	409.07	373.73
Health and Human Services	2,246.66	2,059.43	1,877.35
Law and Justice	302.19	201.38	207.55
Public Protection	715.01	620.90	577.38
Natural Resources	266.28	252.02	233.17
Development	320.29	375.98	238.54
Transportation	1,128.68	1,081.81	1,004.38
Intergovernmental Revenue Sharing	177.80	231.36	128.56
Debt Service	8.01	8.26	11.15
Total State General Fund Expenditures	**8,419.47**	**9,548.61**	**7,835.68**

Source: State of Alaska Comprehensive Annual Financial Report FY 2008, 2009 and 2010.

5.4.4 RURAL ALASKA AND THE ALASKA NATIVE POPULATION

The cost of living, particularly in the more urban parts of the state, has 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. According to a recent cost of living index , the cost of living in Anchorage is 23.8 percent higher than in the average U.S. city, and in Fairbanks it is 37.3 percent higher (Fried and Shanks 2011). 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), a problem compounded by the lack of year-round employment opportunities and lower money incomes in rural areas (Leask et al. 2001). For example, another recent cost of living study showed that consumer prices in the road-less Interior of Alaska are about 30 percent higher than in Anchorage, and in the North Slope Borough they are about 48 percent higher (McDowell Group 2009a).

TABLE 5.5.4-1

Geographic Cost Differentials by Boroughs and Census Area

Borough/Census Area	2008
Inside Project Corridor	
North Slope Borough	1.48
Yukon-Koyukuk Census Area	1.00
Fairbanks North Star Borough	1.03
Southeast Fairbanks Census Area	1.04
Outside Project Corridor	
Denali Borough	1.00
Municipality of Haines Borough	1.05
Kenai Peninsula Borough	1.01
Matanuska-Susitna Borough	0.95
Municipality of Anchorage	1.00
Municipality of Skagway Borough	1.02
Valdez-Cordova Census Area	1.08
Other - City of Unalaska	1.58

Source: Alaska Geographic Differential Study (2008).

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 participate in subsistence harvests (e.g., hunt, gather, and fish), which substantially reduces their costs for food (Leask et al. 2001).

Particularly important to Alaska's rural population is the annual dividend from the Permanent Fund, a fund established in 1976 which receives 25 percent of all state oil and gas royalties (Goldsmith 2010a). As noted, rural households rely on subsistence harvests, which can fluctuate dramatically from year to year. Under these circumstances, the cash provided by the dividend is substantial not only because of its size, but also because of 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 21 percent in recent years.

Alaska's Native population more than doubled between 1970 and 2010, from 50,801 to 104,871 (Martin and Hill 2009; Mercer 2011).[7] 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); currently, about one in five residents is Alaska Native. The estimated share of Alaska Natives residing in the urban areas of Alaska increased from 17 to 45

[7] The 2010 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.

percent from 1970 to 2009 (Leask et al. 2001; Mercer 2011). Today, about 28 percent of Alaska's Native population lives in Anchorage (Mercer 2011); however, 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. In 2009, 35 percent of Alaska Natives lived in eight remote rural boroughs and census areas where Natives accounted for about 74 percent of the total population.

Trends in the economic condition of Alaska Natives have not been entirely positive. Although poverty among Alaska Natives is less than half what it was in 1970, the greatest improvements occurred between 1970 and 1980. The percentage of Alaska Natives 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. Recent unemployment rates for Alaska Natives are higher than they were 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 aren't actively looking for work) would like to have jobs, but aren't looking because they live in small remote villages with few jobs (Martin and Hill 2009).

Since they were established in 1971 under the Alaska Native Claims Settlement Act (ANCSA), ANCSA corporations have come to play a major role in Alaska's economy and an even more important role in their individual regions. In 2009, 45 percent of the 49 largest Alaska-owned firms, based on revenues, were ANCSA corporations (Cutler 2010). ANCSA corporations employ many Native (and non-Native) Alaskans. ANCSA regional corporations created 13,848 jobs in Alaska in 2008, with a combined payroll of $774 million (Hoffman and Orr 2010). A map showing ANCSA Regional Corporation is in Figure 5.5.4-1. In addition, non-profit organizations 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). Refer to Appendix 5A for detail about service organizations.

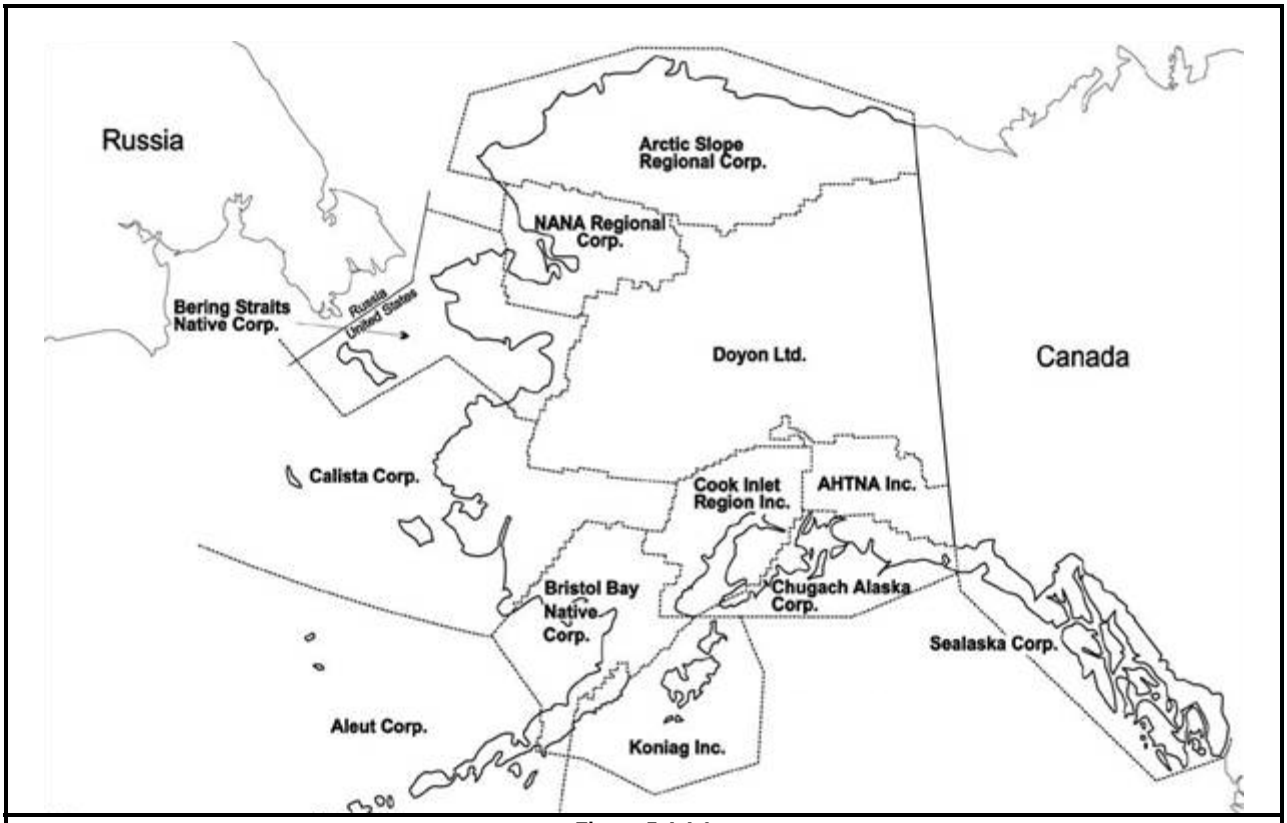


Figure 5.4.4-1

ANCSA Regional Corporations

5.5 EXISTING CONDITIONS AND ANALYSIS OF DIRECT AND INDIRECT IMPACTS

This section describes existing conditions in the socioeconomic study area and the direct and indirects of the Project. Direct effects are caused by the proposed action and occur at the same time and place (40 C.F.R. § 1508.8). The direct socioeconomic effects of the Project include the economic and demographic changes directly caused by development, construction and operation of the Project, including upstream natural gas production and sales.

Indirect effects are caused by the proposed action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 C.F.R. § 1508.8). As described in Section 5.3, the expected indirect socioeconomic effects of the Project include increased oil exploration and development activities on the North Slope. In addition, the spending of state and local government revenues generated directly and indirectly by the Project is expected to result in additional economic activity in Alaska.

5.5.1 DEMOGRAPHIC CHARACTERISTICS

5.5.1.1 Existing Conditions

Population Size and Density

Table 5.5.1-1 provides a summary of population statistics for Alaska and the boroughs and census areas within the immediate region of influence. In 2010, the population of Alaska was 710,231, and 565,072 people, or about 80 percent of the state's population, resided in the immediate region of influence. Nearly 70 percent of the total population of the immediate region of influence lived in the Municipality of Anchorage and the Fairbanks North Star Borough.

Population growth in the immediate region of influence between 2000 and 2010 was most substantial in the Matanuska-Susitna Borough, North Slope Borough, and Fairbanks North Star Borough. The population growth rates in these boroughs were higher than the average Alaska growth rate of 13.1 percent between 2000 and 2010. Other boroughs and census areas within the immediate region of influence experienced moderate growth similar to the state average, with the exception of the Valdez-Cordova Census Area and Yukon-Koyukuk Census Area, which lost population during that period.

The highest population density in the immediate region of influence in 2010 was in the Municipality of Anchorage with an average of 171.9 persons per square mile, which was the highest population density in Alaska. The lowest density of people in the immediate region of influence was in the Yukon-Koyukuk Census Area, which has a density of less than 0.1 persons per square mile.

TABLE 5.5.1-1

Population Size and Density in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Population				Population Density (persons per square mile)	
	2000	2010	Percent of State Total 2010	Percent Change 2000-2010	2000	2010
STATE OF ALASKA	626,932	710,231	100.0	13.3	1.1	1.2
INSIDE PIPELINE CORRIDOR						
North Slope Borough	7,385	9,430	1.3	27.7	0.1	0.1
Yukon-Koyukuk Census Area	6,551	5,588	0.8	-14.7	<0.1	<0.1
Fairbanks North Star Borough	82,840	97,581	13.7	17.8	11.2	13.3
Southeast Fairbanks Census Area	6,174	7,029	1.0	13.8	0.2	0.3
Inside Pipeline Corridor Total	102,950	119,628	16.8	16.2		
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	1,893	1,826	0.3	-3.5	0.1	0.1
Municipality of Haines Borough	2,392	2,508	0.4	4.8	1.0	1.1
Kenai Peninsula Borough	49,691	55,400	7.8	11.5	3.1	3.4
Matanuska-Susitna Borough	59,322	88,995	12.5	50.0	2.4	3.6
Municipality of Anchorage	260,283	291,826	41.1	12.1	153.4	171.9
Municipality of Skagway Borough	862	968	0.1	12.3	1.9	2.1
Valdez-Cordova Census Area	10,195	9,636	1.4	-5.5	0.3	0.3
Other – City of Unalaska	4,283	4,376	0.6	2.2	38.6	39.1

Source: U.S. Census Bureau, 2010 Census (2011).

The largest community inside the pipeline corridor is Fairbanks, which had a population of 31,535 in 2010, while the smallest community in the corridor is Coldfoot, which had a 2010 population of 10. Fairbanks' population increased at a rate of 4.3 percent between 2000 and 2010, which is slower than the Fairbanks North Star Borough growth rate, and substantially slower than the nearby smaller communities of North Pole, Ester, and Fox, which grew in excess of 30 percent between 2000 and 2010. The North Slope Borough population registered a substantial increase in population between 2000 and 2010 due primarily to the inclusion of oil industry workers residing in group quarters in the Prudhoe Bay Census Data Place in the 2010 U.S. 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.

Similar to the North Slope Borough traditional communities, most communities in the Southeast Fairbanks Census Area lost population between 2000 and 2010 even though the census area population increased over that period. Population losses for the three Yukon-Koyukuk communities that are located along the pipeline corridor (Wiseman, Livengood, and Coldfoot) ranged between 23 and 55 percent between 2000 and 2010. Residents of rural villages located on the road system in Interior Alaska appear to be migrating to Fairbanks or to Southcentral Alaska in search of better employment opportunities (Williams 2010).

Age Characteristics

Table 5.5.1-2 shows age characteristics of boroughs and census areas in the immediate region of influence in 2010. The Municipality of Skagway Borough had the highest proportion of working-age adults, while the Yukon-Koyukuk Census Area had the lowest. This smaller proportion of working-age population is fairly typical of rural areas.

TABLE 5.5.1-2

Age Characteristics in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Age (2010)			
	Under 16 Years	16-64 Years	65 Years and Over	
	Percent			Median
STATE OF ALASKA	23.4	68.9	7.7	33.8
INSIDE PIPELINE CORRIDOR				
North Slope Borough	21.3	74.4	4.3	35.1
Yukon-Koyukuk Census Area	24.4	65.4	10.2	35.3
Fairbanks North Star Borough	23.0	70.4	6.5	31.0
Southeast Fairbanks Census Area	23.1	67.5	9.4	37.4
OUTSIDE PIPELINE CORRIDOR				
Denali Borough	19.9	72.6	7.5	41.5
Municipality of Haines Borough	17.5	68.8	13.8	46.9
Kenai Peninsula Borough	20.6	68.0	11.3	40.6
Matanuska-Susitna Borough	25.5	66.6	7.9	34.8
Municipality of Anchorage	23.0	69.7	7.2	32.9
Municipality of Skagway Borough	13.2	77.7	9.1	41.2
Valdez-Cordova Census Area	21.5	70.2	8.3	39.8
Other – City of Unalaska	12.0	85.3	2.7	40.7

Source: U.S. Census Bureau, 2010 Census (2011) .

With respect to communities in the pipeline corridor, Fairbanks had a lower median age (27.9 years) than the state median age in 2010 due to the presence of the University of Alaska Fairbanks' student population. The traditional communities in the North Slope Borough also had a median age lower than the state median age. Communities with higher median ages include Dot Lake and Livengood, which had median ages of 48.5 years and 50.8 years, respectively.

5.5.1.2 Impacts and Mitigation

[Note: Mitigations will be more fully developed for the final report and will take into consideration mitigation measures suggested by stakeholders.]

No Action Alternative

Population growth is influenced by growth in employment. When job growth is rapid, the increase in the demand for labor results in net immigration to Alaska, and this adds to the growth attributable to natural increase (births minus deaths). The population projections presented in Table 5.5.1-3 for the No Action Alternative are based on historical trends in births, deaths, in-migration, and out-migration. The migration components are based on assumptions of employment opportunities in Alaska under the No Action Alternative.

Under the No Action Alternative, Alaska's population is expected to increase by 49 percent between 2015 and 2050. Population change is projected to vary across different regions of the state, following paths similar to those experienced in recent years. Large population gains are expected for the "Anchorage/Mat-Su" region, with an estimated projected increase of 65 percent between 2015 and 2050. Following Alaska's trend of rural to urban migration, Anchorage is expected to continue its strong growth. The Matanuska-Susitna Borough, with its proximity to Anchorage, abundant land and increasing service resources, is also predicted to show continued substantial growth. Population in the Fairbanks North Star Borough and Southeast Fairbanks Census Area is also expected to grow steadily; however, changes in the large military population of the Fairbanks North Star Borough, which are especially hard to predict, may strongly impact the future population level of the Interior (Hunsinger 2007).

TABLE 5.5.1-3

Projected Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	767,600	838,450	900,220	952,060	1,031,230	1,149,020
INSIDE PIPELINE CORRIDOR						
North Slope Borough	11,750	14,000	15,510	16,630	17,500	17,810
Yukon-Koyukuk Census Area	5,400	5,800	6,290	6,670	7,140	6,570
Fairbanks North Star Borough	102,430	109,430	114,930	119,840	124,510	132,440
Southeast Fairbanks Census Area	9,160	10,280	11,070	11,620	12,380	13,470
Inside Pipeline Corridor Total	128,740	136,210	144,090	150,820	157,420	166,160
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	1,760	1,770	1,790	1,810	1,860	1,930
Municipality of Haines Borough	2,570	2,760	2,950	3,150	3,480	3,980
Kenai Peninsula Borough	54,320	56,520	58,730	60,470	63,270	69,900
Matanuska-Susitna Borough	111,540	136,770	154,290	168,360	193,450	230,420
Municipality of Anchorage	317,360	345,700	373,060	395,630	430,080	479,320
Municipality of Skagway Borough	1,120	1,340	1,550	1,720	2,000	2,330
Valdez-Cordova Census Area	9,480	9,670	9,830	9,920	10,060	10,620
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

The projected population by age group in Alaska and the immediate region of influence under the No Action Alternative is presented in Table 5.5.1-4 through Table 5.5.1-6. The most rapid growth is expected to occur in the oldest (65 years of age and over) age group, with a more than 160 percent increase between 2015 and 2050. The median age in Alaska is projected to increase from 32 in 2015 to 37 in 2050 (Table 5.5.1-7).

TABLE 5.5.1-4

Projected Under 16 Years of Age Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	184,000	208,100	221,700	223,100	227,800	256,200
INSIDE PIPELINE CORRIDOR						
North Slope Borough	2,190	2,660	2,890	2,940	2,770	2,730
Yukon-Koyukuk Census Area	1,210	1,270	1,340	1,390	1,440	1,180
Fairbanks North Star Borough	26,060	29,830	31,860	31,390	30,960	33,470
Southeast Fairbanks Census Area	2,210	2,530	2,670	2,630	2,550	2,810
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	400	390	380	360	360	370
Municipality of Haines Borough	600	640	670	680	720	830
Kenai Peninsula Borough	12,460	12,840	12,810	12,470	12,520	14,160
Matanuska-Susitna Borough	27,110	34,390	38,650	40,230	42,370	50,990
Municipality of Anchorage	76,710	86,560	93,070	94,090	96,670	108,500
Municipality of Skagway Borough	270	330	380	400	430	500
Valdez-Cordova Census Area	2,190	2,220	2,180	2,070	2,010	2,170
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

TABLE 5.5.1-5

Projected 16-64 Years of Age Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	505,100	527,700	549,100	580,000	636,100	689,400
INSIDE PIPELINE CORRIDOR						
North Slope Borough	6,110	9,030	9,320	9,600	9,870	10,090
Yukon-Koyukuk Census Area	3,570	3,700	3,910	4,090	4,390	3,870
Fairbanks North Star Borough	66,200	65,980	66,150	69,360	73,740	76,930
Southeast Fairbanks Census Area	6,140	6,620	6,960	7,290	7,790	8,060
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	1,160	1,120	1,090	1,080	1,110	1,120
Municipality of Haines Borough	1,710	1,760	1,840	1,960	2,170	2,420
Kenai Peninsula Borough	36,000	35,820	36,120	36,830	38,560	41,380
Matanuska-Susitna Borough	74,990	89,140	98,290	107,260	124,440	142,830
Municipality of Anchorage	209,180	216,570	226,420	239,990	264,770	287,890
Municipality of Skagway Borough	760	880	1,000	1,110	1,290	1,450
Valdez-Cordova Census Area	6,250	6,050	5,910	5,890	5,990	6,130
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

TABLE 5.5.1-6

Projected 65 Years of Age and Over Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	75,800	102,700	129,400	149,000	167,400	203,500
INSIDE PIPELINE CORRIDOR						
North Slope Borough	770	1,080	1,400	1,680	2,090	2,750
Yukon-Koyukuk Census Area	620	830	1,040	1,190	1,310	1,530
Fairbanks North Star Borough	10,180	13,630	16,930	19,090	19,820	22,030
Southeast Fairbanks Census Area	810	1,130	1,440	1,700	2,030	2,610
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	200	260	330	370	390	440
Municipality of Haines Borough	260	350	440	510	590	730
Kenai Peninsula Borough	5,860	7,850	9,800	11,160	12,200	14,360
Matanuska-Susitna Borough	9,440	13,250	17,350	20,870	26,640	36,610
Municipality of Anchorage	31,460	42,570	53,570	61,560	68,640	82,920
Municipality of Skagway Borough	100	140	180	210	270	380
Valdez-Cordova Census Area	1,050	1,400	1,730	1,950	2,060	2,320
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

TABLE 5.5.1-7

Projected Median Age in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	32	34	36	37	37	37
INSIDE PIPELINE CORRIDOR						
North Slope Borough	32	34	35	37	39	41
Yukon-Koyukuk Census Area	36	37	38	39	41	45
Fairbanks North Star Borough	32	33	34	34	33	34
Southeast Fairbanks Census Area	33	34	36	38	39	39
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	35	37	40	42	43	42
Municipality of Haines Borough	34	36	37	39	39	39
Kenai Peninsula Borough	35	37	39	40	41	40
Matanuska-Susitna Borough	32	33	35	36	37	37
Municipality of Anchorage	33	34	35	36	37	37
Municipality of Skagway Borough	32	34	35	36	37	38
Valdez-Cordova Census Area	35	37	39	40	42	41
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

Project

The Project study period extends for 40 years from 2011 through 2050. The Project activities during this time period can be described as consisting of three phases:

1. Development
2. Construction
3. Operations

For purposes of this report the development phase is assumed to be conducted in years 2011 through 2014, construction phase from 2015 through 2021 which includes schedule construction and slippage allowance, and operations from first gas in late 2020 through 2050. The timing for these phases may change as new project information becomes available.

Development Phase

It is expected that the existing in-state labor force would supply many of the requirements for surveying, environmental studies, and logistics. Design and engineering work would primarily be accomplished elsewhere in the United States and Canada. Many non-resident workers in the development phase would be on short-term assignments, rotating between Alaska and their home offices. As a result, the expected population increase would be minor and temporary.

Construction Phase

Construction of the Project would create employment opportunities in Alaska, which, in turn, would result in a higher statewide resident population relative to the No Action Alternative by increasing in-migration and reducing out-migration. In addition to the jobs directly related to Project construction, jobs would be generated by the purchases of Project goods and services and by payroll spending by Project workers and third-party contractors. Moreover, as described in Section 5.3, the commencement of Project construction has the potential to stimulateincreased exploration for oil and gas on the North Slope, with additional oil production occurring as soon as 2021. This additional oil production would result in increased state and local government spending, which would increase employment and population growth in Alaska.

According to Information Insights (2004), during the construction phase of the Project there also could be a large influx of people whose only reason to come to Alaska would be a speculative job search. Information Insights notes that this kind of in-migration occurred during the construction of TAPS, which came at the peak of a national recession. However, given the difficulty of predicting what the state of the U.S. economy will be in several years, there is considerable uncertainty regarding the number of people that might come to Alaska in search of jobs and Project-related business opportunities during the construction phase. Moreover, the peak number of direct jobs created by the Project would be much lower than TAPS (refer to Appendix 5C). APP expects that a peak construction workforce of approximately 5,000 to 7,000 for the pipeline, about 800 for the GTP, about 150 for each compressor station (assuming two compressor stations are constructed per year), and approximately 100 for each meter station. Thus, APP expects approximately 6,200 to 8,200 direct jobs for the Project, and Alaska residents are anticipated to fill a portion of these jobs. The peak workforce estimate includes full-time and part-time jobs with many of the construction jobs peaking in the winter and the summer construction seasons. This estimate of peak number of direct jobs includes contingency and schedule construction siippage allowances. The use of this peak estimate results in effects that are at the high end of the expected values.

While net migration in Alaska would increase substantially during the Project's construction phase, the increase in population would be temporary. Most in-migrants are expected to leave the state when construction of the Project is finished, just as most non-residents and their dependents left Alaska after TAPS was completed (Hunsinger 2007). Relatively few in-migrants are expected to remain in Alaska as residents. Table 5.5.1-8 shows that the direct effect of the Project on Alaska's resident population during the construction phase is estimated to be less than a two percent increase relative to the No Action Alternative.

Table 5.5.1-8 also shows that the direct effect of the Project on the resident population would vary across boroughs and census areas in the immediate region of influence, but in no area is the estimated effect much greater than five percent. The Fairbanks North Star Borough and Municipality of Anchorage would be the primary locations in Alaska where the Project would purchase goods and services from local businesses during the construction phase. The additional economic activity and jobs these purchases would generate are expected to result in a substantial increase in the resident population in absolute terms, but the increase in percentage terms would be minor due to the large existing populations of the borough and municipality.

TABLE 5.5.1-8

Incremental Change in Projected Resident Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
STATE OF ALASKA	Number	1,200	2,900	6,600	10,000	11,500	11,500	12,600	18,000	19,900	19,900	20,100
	Percent	0.2%	0.4%	0.8%	1.3%	1.4%	1.4%	1.5%	2.1%	2.2%	2.1%	1.9%
INSIDE PIPELINE CORRIDOR												
North Slope Borough	Number	0	0	20	50	80	110	110	150	250	460	640
	Percent	0.0%	0.0%	0.2%	0.5%	0.8%	1.1%	1.0%	1.4%	2.1%	3.6%	4.8%
Yukon-Koyukuk Census Area	Number	0	10	50	80	90	90	100	110	110	100	100
	Percent	0.0%	0.2%	0.9%	1.5%	1.6%	1.6%	1.7%	1.9%	1.7%	1.5%	1.4%
Fairbanks North Star Borough	Number	10	220	740	1,170	1,290	1,300	1,350	1,610	1,670	1,520	1,510
	Percent	0.0%	0.2%	0.7%	1.1%	1.2%	1.2%	1.2%	1.5%	1.5%	1.3%	1.2%
Southeast Fairbanks Census Area	Number	0	10	40	60	70	70	70	90	90	80	90
	Percent	0.0%	0.1%	0.4%	0.6%	0.7%	0.7%	0.7%	0.9%	0.8%	0.7%	0.7%
Inside Pipeline Corridor Total	Number	20	250	850	1,360	1,530	1,580	1,640	1,960	2,120	2,170	2,350
	Percent	0.0%	0.2%	0.7%	1.0%	1.2%	1.2%	1.2%	1.4%	1.5%	1.4%	1.5%
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	Number	0	0	0	10	10	10	10	10	10	20	20
	Percent	0.0%	0.0%	0.0%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	1.1%	1.1%
Municipality of Haines Borough	Number	0	0	10	20	20	20	20	20	10	10	10
	Percent	0.0%	0.0%	0.4%	0.8%	0.7%	0.7%	0.7%	0.7%	0.3%	0.3%	0.3%
Kenai Peninsula Borough	Number	30	100	310	490	540	580	690	1,150	1,290	1,330	1,350
	Percent	0.1%	0.2%	0.6%	0.9%	1.0%	1.0%	1.2%	2.0%	2.2%	2.2%	2.1%
Matanuska-Susitna Borough	Number	210	500	1,230	1,980	2,310	2,420	2,670	3,880	4,380	4,640	4,930
	Percent	0.2%	0.4%	1.1%	1.6%	1.8%	1.8%	2.0%	2.7%	2.8%	2.8%	2.5%
Municipality of Anchorage	Number	880	1,940	3,720	5,460	6,260	6,200	6,810	10,280	11,400	11,220	10,870
	Percent	0.3%	0.6%	1.1%	1.7%	1.9%	1.8%	2.0%	2.9%	3.1%	2.8%	2.5%
Municipality of Skagway Borough	Number	0	10	20	40	40	40	40	50	50	40	40
	Percent	0.0%	0.9%	1.7%	3.3%	3.2%	3.1%	3.0%	3.6%	3.2%	2.3%	2.0%
Valdez-Cordova Census Area	Number	0	10	20	40	40	40	40	50	50	40	40
	Percent	0.0%	0.1%	0.2%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.4%	0.4%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

Table 5.5.1-9 shows that the combined direct and indirect effects of the Project on Alaska's resident population during the construction phase would be minor. The largest percent increase in the resident population is expected to occur in the North Slope Borough. Project construction, together with the increase in North Slope oil and gas exploration that is expected to be triggered by the Project, would require the services of a number of oil and gas industry firms currently located at Deadhorse, and these firms would likely add staff to meet the demand. In addition, the North Slope Borough would start receiving additional property taxes after pipe and equipment for the Project is delivered to North Slope construction sites. This additional local government revenue is expected to generate additional jobs in the borough, thereby leading to population growth.

The combined direct and indirect effects of the Project on age group populations are presented in Table 5.5.1-10 through Table 5.5.1-12. The additional employment opportunities would result in a higher number of working-age residents compared to the No Action Alternative. Since most of the persons in the "under 16 years" and "over 64 years" age groups are not in the labor force, the employment opportunities created during the Project's construction phase would have limited effect on the population sizes of these groups. However, because many of the additional working-age residents would have children, the under 16 years of age cohort population would exceed that under the No Action Alternative. Table 5.5.1-13 shows that the presence of the additional working-age residents and their children would have a downward effect on the median age in Alaska.

Most of the Project related growth in the number of children would occur in areas where there would be large increases in employment opportunities as a result of purchases by the Project and payroll spending by Project employees and third-party contractors. As discussed above, these areas include the Fairbanks North Star Borough, Municipality of Anchorage and North Slope Borough.

TABLE 5.5.1-9

Incremental Change in Projected Resident Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
STATE OF ALASKA	Number	3,500	5,900	10,700	15,100	17,600	18,900	22,600	34,400	51,800	71,100	77,500
	Percent	0.5%	0.8%	1.3%	1.9%	2.1%	2.3%	2.7%	3.8%	5.4%	6.9%	6.7%
INSIDE PIPELINE CORRIDOR												
North Slope Borough	Number	90	120	180	280	360	430	500	640	590	500	340
	Percent	0.8%	1.0%	1.4%	2.1%	2.6%	3.1%	3.5%	4.1%	3.5%	2.9%	1.9%
Yukon-Koyukuk Census Area	Number	10	20	70	110	130	140	290	860	1,440	2,070	2,060
	Percent	0.2%	0.4%	1.3%	2.0%	2.3%	2.4%	4.9%	13.7%	21.6%	29.0%	31.4%
Fairbanks North Star Borough	Number	310	560	1,200	1,790	2,130	2,700	3,430	4,480	5,350	5,690	5,760
	Percent	0.3%	0.5%	1.1%	1.7%	2.0%	2.5%	3.1%	3.9%	4.5%	4.6%	4.3%
Southeast Fairbanks Census Area	Number	10	20	50	90	100	100	230	660	1,020	1,380	1,550
	Percent	0.1%	0.2%	0.5%	0.9%	1.0%	1.0%	2.2%	6.0%	8.8%	11.1%	11.5%
Inside Pipeline Corridor Total	Number	460	770	1,580	2,380	2,860	3,550	4,650	6,910	8,650	9,850	9,840
	Percent	0.4%	0.6%	1.2%	1.8%	2.1%	2.6%	3.4%	4.8%	5.7%	6.3%	5.9%
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	Number	0	0	10	0	10	20	10	10	10	30	50
	Percent	0.0%	0.0%	0.6%	0.0%	0.6%	1.1%	0.6%	0.6%	0.6%	1.6%	2.6%
Municipality of Haines Borough	Number	0	0	20	30	30	30	40	60	90	90	90
	Percent	0.0%	0.0%	0.8%	1.1%	1.1%	1.1%	1.4%	2.0%	2.9%	2.6%	2.3%
Kenai Peninsula Borough	Number	170	330	630	930	1,140	1,360	1,760	2,890	4,000	5,060	4,720
	Percent	0.3%	0.6%	1.1%	1.7%	2.0%	2.4%	3.1%	4.9%	6.6%	8.0%	6.8%
Matanuska-Susitna Borough	Number	1,210	1,760	2,780	3,570	4,020	4,230	4,850	6,830	10,080	13,590	15,710
	Percent	1.1%	1.5%	2.3%	2.8%	3.0%	3.1%	3.4%	4.4%	6.0%	7.0%	6.8%
Municipality of Anchorage	Number	1,590	2,860	4,890	6,770	7,780	7,780	9,080	14,660	24,480	33,500	36,750
	Percent	0.5%	0.9%	1.5%	2.0%	2.3%	2.3%	2.6%	3.9%	6.2%	7.8%	7.7%
Municipality of Skagway Borough	Number	0	10	0	10	0	10	10	20	30	60	60
	Percent	0.0%	0.9%	0.0%	0.8%	0.0%	0.7%	0.7%	1.3%	1.7%	3.0%	2.6%
Valdez-Cordova Census Area	Number	10	10	30	40	50	60	80	90	120	140	140
	Percent	0.1%	0.1%	0.3%	0.4%	0.5%	0.6%	0.8%	0.9%	1.2%	1.4%	1.3%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

TABLE 5.5.1-10

Incremental Change in Projected Under 16 Years of Age Resident Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
State of Alaska	Number	1,000	1,600	2,900	4,100	4,900	5,300	5,900	10,100	15,100	18,700	17,300
	Percent	0.5%	0.8%	1.5%	2.1%	2.4%	2.5%	3.3%	4.6%	6.8%	8.2%	6.8%
Inside Project Corridor												
North Slope Borough	Number	40	50	70	100	140	160	200	270	250	140	60
	Percent	1.8%	2.2%	2.9%	4.0%	5.4%	6.0%	7.4%	9.3%	8.5%	5.1%	2.2%
Yukon-Koyukuk Census Area	Number	0	10	20	30	30	40	80	240	420	570	450
	Percent	0.0%	0.8%	1.7%	2.5%	2.4%	3.1%	6.2%	17.9%	30.2%	39.6%	38.1%
Fairbanks North Star Borough	Number	80	150	320	480	590	750	960	1,320	1,590	1,360	1,170
	Percent	0.3%	0.6%	1.2%	1.7%	2.0%	2.5%	3.2%	4.1%	5.1%	4.4%	3.5%
Southeast Fairbanks Census Area	Number	0	10	10	20	20	30	70	180	300	380	340
	Percent	0.0%	0.4%	0.4%	0.8%	0.8%	1.2%	2.7%	6.7%	11.4%	14.9%	12.1%
Outside Project Corridor												
Denali Borough	Number	0	0	0	0	10	10	10	0	0	10	20
	Percent	0.0%	0.0%	0.0%	0.0%	2.6%	2.6%	2.6%	0.0%	0.0%	2.8%	5.4%
Municipality of Haines Borough	Number	0	0	0	10	0	10	10	20	30	20	20
	Percent	0.0%	0.0%	0.0%	1.6%	0.0%	1.6%	1.5%	3.0%	4.4%	2.8%	2.4%
Kenai Peninsula Borough	Number	50	90	170	250	310	380	490	840	1,180	1,310	980
	Percent	0.4%	0.7%	1.3%	2.0%	2.4%	3.0%	3.8%	6.6%	9.5%	10.5%	6.9%
Matanuska-Susitna Borough	Number	320	480	760	990	1,140	1,210	1,400	2,020	2,920	3,550	3,590
	Percent	1.2%	1.7%	2.5%	3.1%	3.5%	3.5%	3.9%	5.2%	7.3%	8.4%	7.0%
Municipality of Anchorage	Number	430	770	1,320	1,840	2,170	2,220	2,610	4,260	7,050	8,970	8,190
	Percent	0.6%	1.0%	1.6%	2.2%	2.6%	2.6%	3.0%	4.6%	7.5%	9.3%	7.5%
Municipality of Skagway Borough	Number	0	0	0	10	0	0	0	0	10	20	10
	Percent	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	2.5%	4.7%	2.0%
Valdez-Cordova Census Area	Number	0	0	10	20	20	20	20	30	30	30	30
	Percent	0.0%	0.0%	0.5%	0.9%	0.9%	0.9%	0.9%	1.4%	1.4%	1.5%	1.4%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

TABLE 5.5.1-11

Incremental Change in Projected 16-64 Years of Age Resident Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
State of Alaska	Number	2,500	4,200	7,800	10,900	12,500	13,400	14,300	23,600	35,200	48,000	51,700
	Percent	0.5%	0.8%	1.5%	2.1%	2.4%	2.5%	3.3%	4.3%	6.1%	7.5%	7.5%
Inside Project Corridor												
North Slope Borough	Number	130	180	270	380	500	610	690	1,130	960	430	180
	Percent	1.5%	2.0%	2.9%	4.0%	5.1%	6.0%	6.7%	10.3%	8.1%	3.5%	1.5%
Yukon-Koyukuk Census Area	Number	10	20	50	80	90	100	210	610	990	1,400	1,390
	Percent	0.3%	0.6%	1.4%	2.2%	2.5%	2.7%	5.6%	15.6%	24.2%	31.9%	35.9%
Fairbanks North Star Borough	Number	220	410	880	1,290	1,520	1,920	2,430	3,050	3,570	3,870	3,790
	Percent	0.3%	0.6%	1.3%	1.9%	2.3%	2.9%	3.7%	4.6%	5.1%	5.2%	4.9%
Southeast Fairbanks Census Area	Number	10	10	40	60	70	80	170	460	700	930	1,040
	Percent	0.2%	0.2%	0.6%	0.9%	1.1%	1.2%	2.5%	6.6%	9.6%	11.9%	12.9%
Outside Project Corridor												
Denali Borough	Number	0	10	10	10	10	0	10	10	10	30	30
	Percent	0.0%	0.9%	0.9%	0.9%	0.9%	0.0%	0.9%	0.9%	0.9%	2.7%	2.7%
Municipality of Haines Borough	Number	0	0	10	20	20	20	30	40	60	60	60
	Percent	0.0%	0.0%	0.6%	1.1%	1.1%	1.1%	1.7%	2.2%	3.1%	2.8%	2.5%
Kenai Peninsula Borough	Number	130	240	460	670	810	970	1,250	2,000	2,710	3,410	3,120
	Percent	0.4%	0.7%	1.3%	1.9%	2.3%	2.7%	3.5%	5.5%	7.4%	8.8%	7.5%
Matanuska-Susitna Borough	Number	870	1,270	2,000	2,560	2,850	2,950	3,380	4,650	6,830	9,180	10,440
	Percent	1.2%	1.6%	2.5%	3.1%	3.3%	3.3%	3.7%	4.7%	6.4%	7.4%	7.3%
Municipality of Anchorage	Number	1,160	2,070	3,550	4,880	5,550	5,460	6,330	10,100	16,750	22,540	24,680
	Percent	0.6%	1.0%	1.7%	2.3%	2.6%	2.5%	2.9%	4.5%	7.0%	8.5%	8.6%
Municipality of Skagway Borough	Number	0	0	0	0	0	0	0	10	20	40	50
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.8%	3.1%	3.4%
Valdez-Cordova Census Area	Number	0	10	20	40	40	40	50	70	80	100	90
	Percent	0.0%	0.2%	0.3%	0.7%	0.7%	0.7%	0.8%	1.2%	1.4%	1.7%	1.5%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent											

Source: Northern Economics (2011)

TABLE 5.5.1-12

Incremental Change in Projected 65 Years of Age and Over Resident Population in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
State of Alaska	Number	0	0	100	100	200	200	300	700	1,500	4,300	8,400
	Percent	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.5%	1.0%	2.6%	4.1%
Inside Project Corridor												
North Slope Borough	Number	0	0	10	0	0	0	10	20	40	80	130
	Percent	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.9%	1.4%	2.4%	3.8%	4.7%
Yukon-Koyukuk Census Area	Number	0	0	0	0	10	0	0	10	30	100	220
	Percent	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	1.0%	2.5%	7.6%	14.4%
Fairbanks North Star Borough	Number	0	0	0	10	20	30	40	100	190	450	810
	Percent	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.3%	0.6%	1.0%	2.3%	3.7%
Southeast Fairbanks Census Area	Number	0	0	0	0	0	0	0	10	20	80	150
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	1.2%	3.9%	5.7%
Outside Project Corridor												
Denali Borough	Number	0	0	0	0	0	0	0	0	0	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Municipality of Haines Borough	Number	0	0	0	0	0	0	0	0	0	0	10
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%
Kenai Peninsula Borough	Number	0	0	0	0	10	20	10	50	120	320	610
	Percent	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.1%	0.5%	1.1%	2.6%	4.2%
Matanuska-Susitna Borough	Number	10	10	20	30	40	60	70	160	330	870	1,660
	Percent	0.1%	0.1%	0.2%	0.3%	0.3%	0.5%	0.5%	0.9%	1.6%	3.3%	4.5%
Municipality of Anchorage	Number	10	20	20	50	80	110	140	310	670	1,990	3,890
	Percent	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	0.3%	0.6%	1.1%	2.9%	4.7%
Municipality of Skagway Borough	Number	0	0	0	0	0	0	0	0	0	10	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%
Valdez-Cordova Census Area	Number	0	0	0	0	0	0	0	10	10	10	10
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.5%	0.5%	0.4%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent											

Source: Northern Economics (2011).

TABLE 5.5.1-13

Incremental Change in Projected Resident Median Age in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
State of Alaska	Years	1	(1)	(1)	0	(1)	(1)	(1)	(1)	(2)	(1)	(1)
	Percent	3.1%	-2.9%	-2.9%	0.0%	-2.9%	-2.9%	-2.9%	-2.8%	-5.3%	-2.6%	-2.6%
Inside Project Corridor												
North Slope Borough	Years	0	0	(1)	0	0	(1)	(1)	0	0	1	0
	Percent	0.0%	0.0%	-3.0%	0.0%	0.0%	-2.9%	-2.9%	0.0%	0.0%	2.6%	0.0%
Yukon-Koyukuk Census Area	Years	0	0	(1)	(1)	(1)	0	0	(2)	(3)	(3)	(2)
	Percent	0.0%	0.0%	-2.7%	-2.7%	-2.7%	0.0%	0.0%	-5.3%	-7.7%	-7.3%	-4.4%
Fairbanks North Star Borough	Years	0	0	0	(1)	0	0	0	0	0	0	0
	Percent	0.0%	0.0%	0.0%	-3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southeast Fairbanks Census Area	Years	0	0	0	0	0	0	(1)	(1)	(1)	(1)	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-2.9%	-2.8%	-2.6%	-2.6%	0.0%
Outside Project Corridor												
Denali Borough	Years	0	0	0	0	0	0	0	0	(1)	(1)	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-2.4%	-2.3%	0.0%
Municipality of Haines Borough	Years	0	0	0	0	0	(1)	0	0	(1)	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	-2.8%	0.0%	0.0%	-2.6%	0.0%	0.0%
Kenai Peninsula Borough	Years	0	0	0	0	0	(1)	0	(1)	(1)	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	-2.7%	0.0%	-2.6%	-2.5%	0.0%	0.0%
Matanuska-Susitna Borough	Years	0	0	0	(1)	0	0	0	(1)	0	0	0
	Percent	0.0%	0.0%	0.0%	-3.0%	0.0%	0.0%	0.0%	-2.9%	0.0%	0.0%	0.0%
Municipality of Anchorage	Years	0	0	0	(1)	0	0	(1)	0	0	(1)	0
	Percent	0.0%	0.0%	0.0%	-2.9%	0.0%	0.0%	-2.9%	0.0%	0.0%	-2.7%	0.0%
Municipality of Skagway Borough	Years	0	0	0	0	0	0	0	0	0	0	0
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Valdez-Cordova Census Area	Years	0	0	(1)	0	0	0	0	0	0	(1)	0
	Percent	0.0%	0.0%	-2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-2.4%	0.0%
Other – City of Unalaska	Years	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent											

Source: Northern Economics (2011).

Operations Phase

Table 5.5.1-8 shows that the direct effect of the Project on Alaska's resident population during the operations phase is estimated to be only about a 2 percent increase relative to the No Action Alternative due primarily to the roughly 535 to 550 Project workforce and operational expenditures. However, as shown in Table 5.5.1-9, by year 2040 of the operations phase the combined direct and indirect effects of the Project would result in an estimated 6.9 percent higher resident population in Alaska in comparison to the No Action Alternative. This statewide population growth would result from the overall growth in jobs that occurs as a result of the Project. As discussed above, when job growth occurs, the increase in the demand for labor results in positive net immigration to Alaska, and this adds to the growth attributable to natural increase. Information Insights (2006) suggested that some residents who received training for Project related jobs might have to leave Alaska as job skills appropriate to and learned for the construction phase become less in demand. However, the current analysis indicates that the additional jobs created during the operations phase by the Project, projected OCS development, and additional incentives for onshore oil and gas production would more than offset possible lost employment opportunities.

Table 5.5.1-8 shows that the largest percentage increase in the number of residents would occur in Yukon-Koyukuk and Southeast Fairbanks Census Areas. As discussed in Section 5.3, the natural gas made available by the Project has the potential to stimulate mining expansion in the Yukon-Koyukuk and Southeast Fairbanks Census Areas because it would lower the energy costs of mining. This increased economic activity would encourage existing residents in the area to stay and attract new ones.

The projected change in the resident population by age group in Alaska and the immediate region of influence during the operations phase is presented in Table 5.5.1-10 through Table 5.5.1-12. The additional employment opportunities would result in a higher number of working-age residents compared to the No Action Alternative, which, in turn, would result in a higher number of children. The largest percentage increases in the number of children would occur in those areas where there would be large increases in employment opportunities. As discussed above, these areas include the Yukon-Koyukuk and Southeast Fairbanks Census Areas.

Since many of the persons in the over 64 years of age cohort population are not in the labor force, the additional employment opportunities during the operations phase would have a limited immediate effect on the number of these individuals. However, as the individuals who filled the additional jobs created during the operations phase grow old, the number of elderly residents would increasingly exceed the number under the No Action Alternative.

5.5.2 ECONOMY

This section contains a discussion of the local and regional economy, including per capita income, employment, unemployment, and the number and composition of the workforce.

5.5.2.1 Existing Conditions

Employment and Income

Table 5.5.2-1 summarizes employment in the boroughs and census areas within the immediate region of influence as measured by the number of jobs. The total 2009 employment in the affected boroughs and census areas was 355,686 jobs, representing about 80 percent of the

statewide employment. A large portion (45.0 percent) of Alaska's employment is concentrated in Anchorage, with 200,691 jobs in 2009. Elsewhere in the immediate region of influence, employment is concentrated in the Fairbanks North Star Borough, Matanuska-Susitna Borough, and Kenai Peninsula Borough, with much smaller employment totals in the other affected boroughs and census areas. Employment data are unavailable at the community level.

TABLE 5.5.2-1

Employment and Per Capita Income in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Employment (2009)	Average Per Capita Income ($) (2005-2009)
STATE OF ALASKA	445,663	29,382
INSIDE PIPELINE CORRIDOR		
North Slope Borough	14,201	24,125
Yukon-Koyukuk Census Area	3,014	18,516
Fairbanks North Star Borough	58,761	28,373
Southeast Fairbanks Census Area	3,777	24,209
OUTSIDE PIPELINE CORRIDOR		
Denali Borough	2,099	44,689
Municipality of Haines Borough	2,381	28,843
Kenai Peninsula Borough	30,543	26,940
Matanuska-Susitna Borough	31,896	24,906
Municipality of Anchorage	200,691	33,436
Municipality of Skagway Borough	1,088	32,801
Valdez-Cordova Census Area	7,235	27,708
Other – City of Unalaska	N/A	25,694

Source: U.S. Department of Commerce, Bureau of Economic Analysis (2011); U.S. Census Bureau, 2005-2009 American Community Survey (2011).

Table 5.5.2-1 also describes the average income distribution of the boroughs and census areas within the immediate region of influence from 2005 through 2009. With the exception of the Denali Borough, Municipality of Anchorage, and Municipality of Skagway Borough, the average personal per capita income for each borough or census area was less than Alaska's per capita income. The borough with the highest per capita income was the Denali Borough, at $44,689. Three of the four affected communities in the Denali Borough have high-paying, year-round employers: Anderson has the Clear U.S. Air Force Station, Healy has Usibelli Coal Mine, Inc. and McKinley Park has the U.S. National Park Service. The relatively high per capita income in the Municipality of Anchorage reflects the more robust economic conditions generated by more urbanized areas. The high per capita income in the Municipality of Skagway Borough is related to the large influx of cruise ships and cruise ship passengers that make port calls at the community during the summer tourist season.

Per capita income in the Yukon-Koyukuk Census Area was the lowest within the immediate region of influence (Table 5.5.2-1). Data for this area most closely reflect trends in personal incomes in small, rural villages in Alaska, with a large number of these villages in the Yukon-Koyukuk Census Area. 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 reduces their costs for food.

Average per capita income from 2005 through 2009 varied greatly across communities in the pipeline corridor. Livengood had the highest per capita income at $35,221. Income in Livengood is currently driven by development of nearby gold deposits. Mentasta Lake and the Mentasta Lake Alaska Native Village Statistical Area had the lowest per capita income at $9,457. By comparison, in the same census area, Delta Junction had a per capita income of $29,964. Average per capita income from 2005 through 2009 in communities outside of the pipeline corridor also varied, with the highest per capita income in Anderson ($64,315) and the lowest in Gulkana ($11,298). In general, larger communities on Alaska's road system had higher per capita incomes than smaller, more isolated communities.

Unemployment

Table 5.5.2-2 shows that a marked variation in unemployment rates existed within the immediate region of influence in 2010. The Municipality of Anchorage, Fairbanks North Star Borough, and North Slope Borough had unemployment rates lower than the state average of eight percent. The remaining affected boroughs and census areas in the immediate region of influence had unemployment rates higher than state averages, ranging from 8.7 percent in the Municipality of Haines Borough and Valdez-Cordova Census Area to 15.4 percent in the Yukon-Koyukuk Census Area. Unemployment is especially high in small, rural villages, particularly during the winter when there is little alternative market-based activity (U.S. Department of the Interior 2002).

It is likely that unemployment data for the immediate region of influence 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 more complicated. Consequently, some people may no longer be actively searching for employment (U.S. Department of the Interior 2002; Robinson 2009). In addition, other people such as homemakers, retirees, and full-time students are often, but not necessarily, members of this group, as well as people engaged full-time in subsistence activities. As shown in Table 5.5.2-2, the average percentage of the working-age (16 years old and over) population that was not in the labor force from 2005 through 2009 was particularly high in the Yukon-Koyukuk Census Area and Kenai Peninsula Borough, with relatively high rates also in the Southeast Fairbanks Census Area, Valdez-Cordova Census Area, Municipality of Haines Borough and Matanuska-Susitna Borough. [Note: 2011(or 2012) unemployment rate and number will be added to Table 5.5.2-2 in the final report.]

TABLE 5.5.2-2

Annual Unemployment and Labor Force Participation Rate in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Unemployment Rate (2010)	Number of Unemployed (2010)	Percent Not in Labor Force (2005-2009 Average)
STATE OF ALASKA	8.0	28,928	28.2
INSIDE PIPELINE CORRIDOR			
North Slope Borough	5.1	273	28.0
Yukon-Koyukuk Census Area	15.4	457	36.6
Fairbanks North Star Borough	7.1	3,295	26.5
Southeast Fairbanks Census Area	10.6	381	32.7
OUTSIDE PIPELINE CORRIDOR			
Denali Borough	9.3	128	15.6
Municipality of Haines Borough	8.7	121	33.2
Kenai Peninsula Borough	10.0	2,728	36.7
Matanuska-Susitna Borough	9.1	3,899	34.3
Municipality of Anchorage	6.9	10,617	25.7
Municipality of Skagway Borough	13.4	89	13.6
Valdez-Cordova Census Area	8.7	455	31.7
Other – City of Unalaska	2.3	70	3.8

Source: U.S. Census Bureau, 2005-2009 American Community Survey (2011); Alaska Department of Labor and Workforce Development ADOLWD (2011b).

The 2010 unemployment rate varied greatly among pipeline corridor communities even within the same borough or census area. The lowest unemployment rate of 2.5 percent was in Ester, which is in the Fairbanks North Star Borough. Other communities in the borough experienced average unemployment rates from 6.2 percent (Fairbanks) to 12.6 percent (Fox). The highest unemployment rates inside the pipeline corridor were in Tetlin Junction (53.7 percent) and Tanacross (53.7), both of which are in the Southeast Fairbanks Census Area.

Outside of the pipeline corridor, the lowest 2010 unemployment rates were in Willow (2.3 percent) and Healy (2.5 percent), and the highest rates (27.7 percent) were in Knik-Fairview in the Matanuska-Susitna Borough and Gulkana in the Valdez-Cordova Census Area. As with pipeline corridor communities, the unemployment rate in communities outside the pipeline corridor varied greatly within the same borough of census area. For example, the Denali Borough community of Healy, which has a year-round source of employment in the Usibelli Coal Mine, had an unemployment rate of 2.8 percent, while McKinley Park, which relies on the seasonal tourism industry, had an unemployment rate of 26 percent.

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 a large percentage. As shown in Table 5.5.2-3, the unemployment rate fluctuated substantially in the Denali and Municipality of Skagway boroughs, both of which are heavily dependent on tourism, while the unemployment rate in large urbanized areas such as Anchorage and the Fairbanks North Star Borough showed relatively little seasonal variation. [Note: Table 5.5.2-3 will be updated in the final report to show monthly unemployment rate for 2011.]

TABLE 5.5.2-3

Monthly Unemployment Rate in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Unemployment Rate (2010)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
STATE OF ALASKA	9.3	9.5	9.2	8.3	7.7	7.7	7.0	7.0	7.2	7.3	7.8	8.1
INSIDE PIPELINE CORRIDOR												
North Slope Borough	5.2	5.5	5.4	5.0	5.1	5.5	5.0	5.0	5.1	4.8	4.9	4.6
Yukon-Koyukuk Census Area	18.9	19.6	18.0	15.4	14.8	14.2	14.2	12.5	12.5	13.1	15.8	16.1
Fairbanks North Star Borough	8.7	8.5	8.2	7.2	6.8	6.9	6.2	6.1	6.2	6.3	6.8	7.1
Southeast Fairbanks Census Area	13.4	14.1	12.9	11.2	9.7	9.3	8.7	8.6	9.0	9.4	10.6	10.8
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	22.4	21.6	18.8	15.1	6.0	4.1	3.6	3.3	4.3	14.6	20.0	17.7
Municipality of Haines Borough	14.5	14.8	13.3	10.5	7.8	6.8	4.6	4.7	5.5	7.8	10.1	12.3
Kenai Peninsula Borough	12.8	13.0	12.3	10.8	9.0	8.6	7.8	7.9	8.6	9.3	10.2	10.7
Matanuska-Susitna Borough	11.0	11.2	11.0	9.6	8.4	8.7	7.9	7.9	7.8	8.0	8.9	9.3
Municipality of Anchorage	7.4	7.7	7.6	7.1	6.8	7.0	6.5	6.6	6.7	6.3	6.4	6.4
Municipality of Skagway Borough	30.3	29.4	24.2	16.5	2.3	2.5	2.0	2.5	3.7	19.6	25.6	27.5
Valdez-Cordova Census Area	12.1	12.7	11.3	9.2	7.4	6.5	5.8	5.8	6.5	9.2	10.2	10.7
Other – City of Unalaska	--	--	--	--	--	--	--	--	--	--	--	--

Source: ADOLWD (2011b).

Workforce Number and Composition

Table 5.5.2-4 summarizes characteristics of the existing Alaska resident workforce in boroughs and census areas within the immediate region of influence. The term workforce as used here is all residents 16 years of age and older and is not the number of employed and unemployed workers. The total 2009 resident workforce within the affected boroughs and census areas was 393,265 individuals, representing 78.7 percent of the statewide workforce. A large portion (40.3 percent) of Alaska's workforce is concentrated in Anchorage, with 201,577 working-age (16 years old and over) residents in 2009. Elsewhere in the immediate region of influence, the resident workforce is concentrated in the Fairbanks North Star Borough, Matanuska-Susitna Borough, and Kenai Peninsula Borough, with much smaller workforce totals in the other affected boroughs and census areas.

According to the Alaska Department of Labor and Workforce Development (ADOLWD) (2011c), the top employers in 10 of the 12 affected boroughs and census areas are local or state government, reflecting the continued importance of the public sector in Alaska. Employment in the population center of Anchorage is dominated by trade and educational and health service jobs, with a smaller number of jobs in sectors such as professional and business services (11 percent) and leisure and hospitality (11 percent).

TABLE 5.5.2-4

Current Resident Workforce and Workforce Composition in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Number of Working-Age Residents (2009)[1]	Top Industries by Employment (2009)
STATE OF ALASKA	499,525	Trade, Transportation and Utilities (20%) Local Government (15%)
INSIDE PIPELINE CORRIDOR		
North Slope Borough	4,570	Local Government (60%) Trade, Transportation and Utilities (10%)
Yukon-Koyukuk Census Area	4,410	Local Government (55%) Trade, Transportation and Utilities (9%)
Fairbanks North Star Borough	62,177	Trade, Transportation and Utilities (22%) State Government (13%)
Southeast Fairbanks Census Area	5,147	Professional and Business Services (19%) Local Government (17%)
OUTSIDE PIPELINE CORRIDOR		
Denali Borough	1,478	Leisure and Hospitality (25%) Local Government (17%)
Municipality of Haines Borough	1,883	Local Government (20%) Trade, Transportation and Utilities (17%)
Kenai Peninsula Borough	41,744	Trade, Transportation and Utilities (20%) Local Government (14%)
Matanuska-Susitna Borough	62,262	Trade, Transportation and Utilities (22%) Educational and Health Services (13%)
Municipality of Anchorage	201,577	Trade, Transportation and Utilities (23%) Educational and Health Services (14%)
Municipality of Skagway Borough	739	Trade, Transportation and Utilities (35%) Local Government (21%)
Valdez-Cordova Census Area	7,278	Trade, Transportation and Utilities (23%) Local Government (21%)
Other – City of Unalaska	1,933	Manufacturing (47%) Trade, Transportation and Utilities (24%)

[1] Federal employees, the military, and the self-employed are not included in these data.

Source: ADOLWD (2011c)

In 2009, the most important economic sectors in nearly all of the communities both inside and outside the pipeline corridor were government, trade, transportation and utilities, and leisure and hospitality. The size of the resident labor force was proportionate to the population. The pipeline corridor community with the largest resident labor force in 2009 was Fairbanks (18,378), while the community outside the pipeline corridor community with the largest resident labor force was Anchorage (201,577).

As described in Appendix 5C, corporations created under the Alaska Native Claims Settlement Act (ANCSA) corporations 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. A portion of these profits goes to shareholders in the form of dividends. The regional and village for-profit ANCSA corporations located in the immediate region of influence are listed in a table in Appendix 5A. In addition, a number of non-profit organizations providing health and social services are major

employers in rural communities. Non-profit corporations offering health-related services for Alaska Natives residing in the immediate region of influence are also presented in Appendix 5A.

Direct employment in the oil and gas sector is concentrated in the North Slope Borough and Municipality of Anchorage, with smaller numbers of workers in the Fairbanks North Star Borough; however, the trades that would be required during Project construction and operation are available from the labor pool in boroughs and census areas throughout Alaska. The ADOLWD (2009) identified 113 occupations critical to the planning, construction, and operation of a gas pipeline. 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, when the percentage of total workers with such experience is considered, it is apparent that all areas of the state have workers with gas pipeline-related occupational skills, including areas outside the immediate region of influence. As shown in Figure 5.5.2-1, many of Alaska's more rural areas have workers experienced in the occupations most needed for building a gas pipeline (Rae 2009).

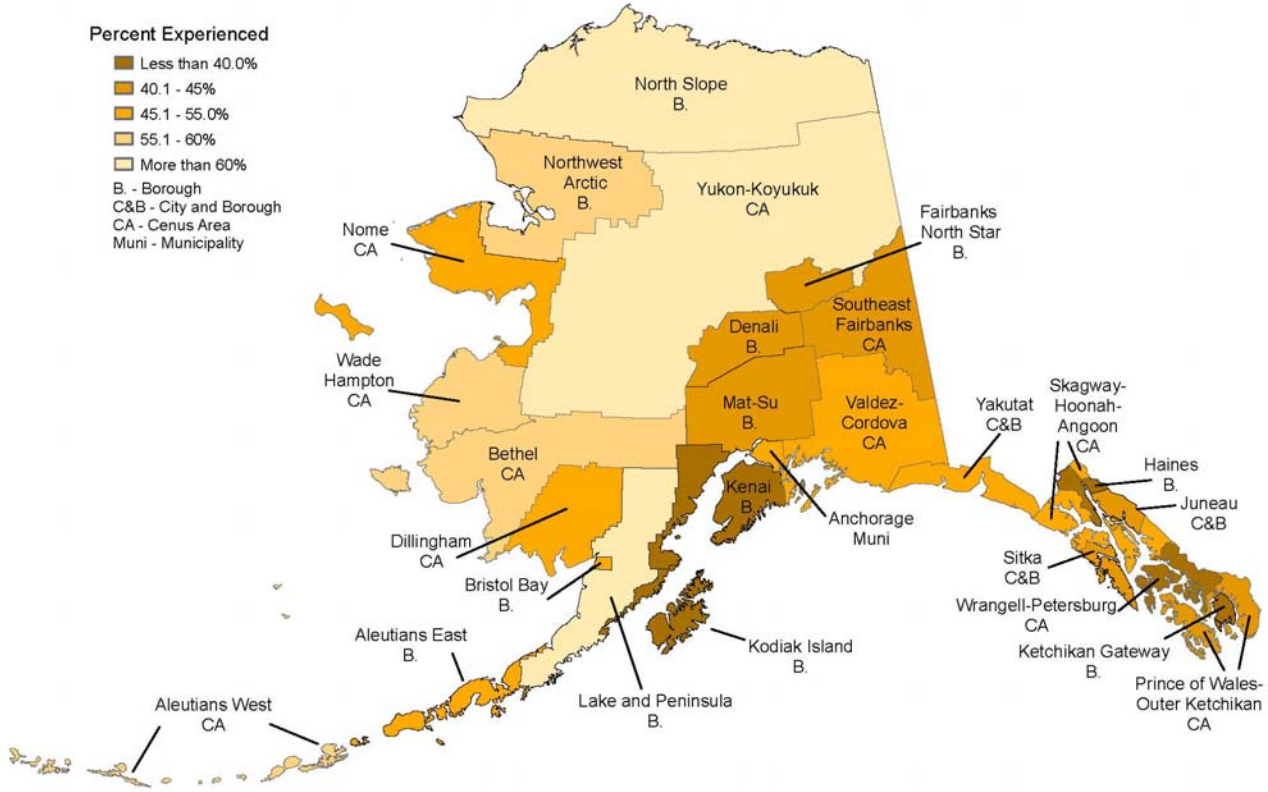
5.5.2.2 Impacts and Mitigation

No Action Alternative

Employment and Income

As shown in Table 5.5.2-5, average annual wage and salary employment is projected to increase between 2015 and 2050 by about 27 percent for boroughs and census areas inside the pipeline corridor, 44 percent for boroughs and census areas outside the pipeline corridor, and 38 percent for the state as a whole. As with population growth, growth in the state's workforce is expected to be concentrated in Southcentral Alaska. The Municipality of Anchorage would continue to be the primary employment location for residents in Southcentral Alaska, but it is anticipated that the Matanuska-Susitna Borough would account for an increasing share of total jobs and income in the "Anchorage/Mat-Su" region as time passes (Goldsmith 2005).

Table 5.5.2-6 shows projected per capita income under the No Action Alternative. Statewide, per capita income is estimated to increase at an average annual rate of 4.6 percent between 2015 and 2050. The fastest increase is expected to occur in the Denali Borough, with an estimated growth rate of 5.1 percent, while the slowest increase is predicted to occur in the North Slope Borough, with an estimated growth rate of 2.9 percent. Among the high-paying, year-round employers in the Denali Borough is Usibelli Coal Mine, Inc., which is expected to increase coal exports. The increased coal production would increase the number of high-paying jobs in the borough. The North Slope Borough is expected to experience a decline in tax revenues as oil production from currently producing North Slope fields declines and oil and gas property depreciates. The declining revenues would cause significant budgetary challenges for the borough.



[1] A worker was considered experienced in an occupation if he or she received wages in that occupation during any four quarters from 2005 through 2007.
Source: Rae (2009)

Figure 5.5.2-1

Residence of Workers Who Have Experience in Gas Pipeline Occupations, 2007[1]

TABLE 5.5.2-5

Projected Employment in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	516,200	554,700	581,700	599,900	652,200	712,900
INSIDE PIPELINE CORRIDOR						
North Slope Borough	12,770	14,330	19,620	19,010	21,860	25,340
Yukon-Koyukuk Census Area	2,320	3,420	3,450	3,530	3,650	2,700
Fairbanks North Star Borough	63,860	65,760	67,460	68,350	70,410	72,720
Southeast Fairbanks Census Area	4,540	4,690	4,780	4,880	5,170	5,450
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	1,560	1,590	1,620	1,670	1,800	1,940
Municipality of Haines Borough	1,720	1,780	1,910	2,040	2,240	2,610
Kenai Peninsula Borough	26,800	28,900	30,350	30,540	31,850	35,630
Matanuska-Susitna Borough	36,230	47,770	45,910	49,870	59,620	72,870
Municipality of Anchorage	250,910	267,720	283,090	292,170	320,080	347,450
Municipality of Skagway Borough	1,200	1,210	1,290	1,400	1,600	1,800
Valdez-Cordova Census Area	6,720	6,900	6,990	7,020	7,350	7,760
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

TABLE 5.5.2-6

Projected Per Capita Income in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	Per Capita Income ($)					
	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	59,000	76,000	93,000	112,000	176,000	288,000
INSIDE PIPELINE CORRIDOR						
North Slope Borough	65,000	76,000	73,000	92,000	124,000	177,000
Yukon-Koyukuk Census Area	39,000	55,000	67,000	80,000	125,000	207,000
Fairbanks North Star Borough	55,000	69,000	84,000	101,000	155,000	247,000
Southeast Fairbanks Census Area	53,000	65,000	78,000	95,000	151,000	250,000
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	54,000	71,000	91,000	115,000	178,000	311,000
Municipality of Haines Borough	57,000	75,000	97,000	116,000	184,000	309,000
Kenai Peninsula Borough	52,000	70,000	89,000	109,000	172,000	287,000
Matanuska-Susitna Borough	51,000	66,000	78,000	95,000	152,000	257,000
Municipality of Anchorage	67,000	86,000	105,000	127,000	198,000	322,000
Municipality of Skagway Borough	74,000	85,000	98,000	115,000	176,000	298,000
Valdez-Cordova Census Area	60,000	79,000	99,000	123,000	193,000	320,000
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

Project

Expenditures by the Project during the development and construction phases would increase economic activity within the boroughs and census areas affected by the Project, which would have a multiplier effect on the local economy. The notion of a multiplier effect rests upon the difference between the initial effect of Project expenditures on employment, income (i.e., wages and benefits) and output (i.e., the value of goods and services produced) and the total effects of those expenditures. The total effects can be calculated as the sum of the direct, indirect, and induced economic effects, which are defined as follows:

- Direct economic effects. The initial Project-related changes in employment, income and output, such as the hiring of construction workers and purchases of goods and services. Direct economic impacts initiate subsequent rounds of spending and re-spending and result in indirect and induced economic effects.
- Indirect economic effects. The Project-related changes in employment, income and output that result from supplier industries purchasing local goods and services to produce their products.
- Induced economic effects. The Project-related changes in employment, income and output that result from local spending of household income and government revenue generated by direct and indirect effects.

The REMI model was used to calculate the direct, indirect, and induced effects of the Project to the local economy. The REMI model incorporates aspects of four major modeling approaches: input-output, general equilibrium, econometric, and economic geography. Changes in supply, demand, and prices are entered into the REMI model in order to identify the iterative economic and demographic effects of these changes.

Employment and Income

Development Phase

Project-related development spending in Alaska is primarily associated with payroll for Project workers and spending for professional and business services, with smaller expenditures for other sectors of the economy. This development phase spending is estimated to range from approximately $62 million to $120 million per year depending on the year of activity, and based on labor productivity data from the REMI model, generate approximately 580 to 1,030 part-time and full-time jobs per year in the state (Table 5.5.2-7). Since most of Alaska's professional and business services firms are based in Anchorage, and the APP office is in Anchorage, the increase in employment in these sectors would be concentrated in that city. In the rest of the United States the development phase results in approximately $206 to $398 million in expenditures annually and between approximately 1,070 and 2,100 jobs per year depending on the year.

TABLE 5.5.2-7

Projected Project Development Phase Expenditures and Employment in the State of Alaska

	2011	2012	2013	2014
Alaska				
Expenditures (millions of nominal $)	$62-$81	$75-$98	$65-$85	$92-$120
Jobs	580-750	680-890	580-760	790-1,030
Rest of the U.S.				
Expenditures (millions of nominal $)	$245-$320	$304-$398	$218-$285	$206-$269
Jobs	1,330-1,730	1,600-2,100	1,110-1,450	1,070-1,400

Source: Northern Economics (2011)

Construction Phase

Following Project full funding, final engineering design would commence, right-of-way and other property acquisition would start, and procurement activities would begin to ensure that the equipment, modules, and materials needed for Project construction are available when needed. Development of Associated Infrastructure[8] (e.g., clearing, pads, access roads, improvements to airstrips and other facilities) would be undertaken prior to construction of the pipelines and GTP.

This procurement activity would require purchases from Alaska businesses as well as other businesses around the country and around the globe. In the peak construction year of 2018 an estimated $1.5 billion to $1.9 billion might be spent in-state, and a total of $5.0 billion to $6.6 billion might be spent over the entire construction period (Refer to Table 5.5.2-8).

TABLE 5.5.2-8

Projected Project Construction Phase Expenditures in the State of Alaska and in Other States

	2015	2016	2017	2018	2019	2020	2021
Alaska Expenditures (billions of nominal $)	0.23-0.30	0.76-0.99	1.42-1.85	1.48-1.93	0.85-1.11	0.24-0.32	0.04-0.05
Rest of the U.S. Expenditures (billions of nominal $)	0.70-0.92	1.68-2.20	2.50-3.27	2.23-2.91	1.33-1.74	0.43-0.57	0.13-0.18

Source: Northern Economics (2011).

Project construction would create short-term changes in regional employment and labor income.

A substantial level of non-resident employment during the construction phase is expected, but the state is attempting to reduce non-resident hire by training Alaskans to fill pipeline-related jobs (ADOLWD 2009). The direct jobs created by the Project would be attractive to a number of Alaska residents with the requisite skills for a number of reasons. First, there is the potential to work on the Project for multiple years as compared to most constructions jobs that are of shorter

[8] Associated Infrastructure and land required to construct and operate APP include additional temporary workspace (ATWS), access roads, helipads, airstrips, construction camps, pipe storage areas, contractor yards, borrow sites, and dock modifications, as discussed in Section 1.3.3 of Resource Report 1.

duration. Moreover, the Project construction effort would be counter-seasonal to construction employment in the rest of the state, with the higher Project construction workforce peaks occurring during the 2017 and 2018 winter construction seasons.

However, Project employment during the construction phase would not appeal to some Alaskans because many construction jobs would still be seasonal and require extended periods of work in remote camps away from family and friends. The desire or obligation to participate in subsistence activities that conflict with Project work schedules may also discourage some Alaskans from seeking Project employment.

Furthermore, the number of Alaska residents willing to work on the Project would be affected by the employment opportunities offered by other construction projects occurring at the same time the Project is being built. As noted above, it is anticipated that the decision to build the Project would result in other decisions that create additional construction-related and petroleum-related jobs around the state. Moreover, other projects, such as the proposed Susitna (Watana) Dam project, potential development in the OCS in the waters off Alaska's shores, several developing mine projects, and other construction projects that would normally occur as part of normal residential and commercial construction could also compete for skilled labor during the Project construction period, particularly during the summer construction season.

Table 5.5.2-9 shows that an estimated 100,240 to 130,980 person-months of construction labor would be required to build the Project, ranging from approximately 250 to 340 annual construction jobs in 2015 to 2,720 to 3,560 annual construction jobs in 2018 based on average hours worked for construction employees in Alaska. The 6,200 to 8,200 peak workforce noted earlier is full-time and part-time workers and is equivalent to the 2,720 to 3,560 annual construction jobs. As shown in Table 5.5.2-9, the total workforce requirements during the entire 7-year costruction phase would range from approximately 8,420 to 11,040 annual construction jobs. Table 5.5.2-9 also shows that the construction workforce would be concentrated in the North Slope Borough, as the borough would be the location of the GTP, PT Pipeline, and a section of the Alaska Mainline.

Most of the construction jobs would be in the heavy civil construction trade, including heavy equipment operators, site engineers, construction managers, construction laborers and iron/steel workers; however, as discussed in Section 5.5.2.1, a wide range of occupations are needed to construct a natural gas pipeline. The Research and Analysis Section of ADOLWD identified 113 occupations critical to the completion and operation of a gas pipeline; these job categories range from office and field engineering to safety, camps, and catering.

TABLE 5.5.2-9

Projected Project Construction Workforce in Boroughs and Census Areas Inside the Pipeline Corridor

	Person-Months							
	2015	2016	2017	2018	2019	2020	2021	Total
North Slope Borough	2,790-3,640	6,840-8,940	12,190-15,930	11,310-14,780	8,850-11,560	2,680-3,510	500-650	45,160-59,010
Yukon-Koyukuk Census Area	150-190	2,450-3,200	9,770-12,770	8,460-11,050	2,240-2,930	960-1,260	0-0	24,030-31,400
Fairbanks North Star Borough	0-0	0-0	320-410	5,010-6,540	4,200-5,490	160-220	0-0	9,690-12,660
Southeast Fairbanks Census Area	130-170	2,380-3,110	8,970-11,720	7,660-10,010	1,300-1,700	920-1,200	0-0	21,360-27,910
Inside Pipeline Corridor Total	3,070-4,000	11,670-15,250	31,250-40,830	32,440-42,380	16,590-21,680	4,720-6,190	500-650	100,240-130,980
	Annual Construction Jobs Based on Hours Worked							
	2015	2016	2017	2018	2019	2020	2021	Total
North Slope Borough	230-310	580-750	1,030-1,340	950-1,240	740-970	230-300	40-60	3,800-4,970
Yukon-Koyukuk Census Area	10-20	210-270	820-1,080	710-930	190-250	80-110	0-0	2,020-2,660
Fairbanks North Star Borough	0-0	0-0	30-40	420-550	350-460	10-20	0-0	810-1,070
Southeast Fairbanks Census Area	10-10	200-260	750-990	640-840	110-140	80-100	0-0	1,790-2,340
Inside Pipeline Corridor Total	250-340	990-1,280	2,630-3,450	2,720-3,560	1,390-1,820	400-530	40-60	8,420-11,040

Source: Northern Economics (2011)

In addition to construction jobs, the Project would also create management jobs; jobs overseeing environmental monitoring, stakeholder relations, and similar support activities; and engineering jobs for upcoming construction seasons. Some of these additional positions would be located in Anchorage and other Alaska communities, but others would be located in other areas of the United States or in Canada. Table 5.5.2-10 shows the estimated number of other full-time and part-time jobs in Alaska and other U.S. states that would be directly generated by the Project during the construction phase. The estimates show that the project would generate peak employment of approximately 1,900 to 2,400 in 2018 and roughly 8,000 to 10,400 total jobs in Alaska across the construction phase, and roughly 8,300 to 10,900 jobs in other U.S. states during the same period.

TABLE 5.5.2-10

Projected Other Construction-Related Project Employment in the State of Alaska and Other U.S. States

	Number of Workers							
	2015	2016	2017	2018	2019	2020	2021	Total
State of Alaska	1,020-1,330	1,700-2,230	1,770-2,310	1,860-2,430	1,050-1,370	510-660	50-60	7,950-10,390
Other U.S. States	1,180-1,540	1,810-2,360	1,820-2,380	1,850-2,410	1,070-1,400	550-720	60-80	8,330-10,890

Source: Northern Economics (2011).

Finally, construction of the Project would create additional part-time and full-time jobs via the multiplier effect. For example, jobs would be generated in sectors that support the construction sector and in the retail trade and personal services sectors. As shown in Table 5.5.2-11, using an assumed mid-point in the Project employment estimates, the projected indirect and induced change in Alaska employment that would result from the direct effects of the Project would vary between 2,900 and 19,600 during the construction phase. At its maximum in 2018, this direct effect of the Project on Alaska's employment represents a 3.6 percent increase relative to the No Action Alternative.

Table 5.5.2-11 also shows that the projected indirect and induced change in employment would vary across boroughs and census areas in the immediate region of influence. The Fairbanks North Star Borough and Municipality of Anchorage would be the primary locations in Alaska where the Project would purchase goods and services from local businesses during the construction phase.

TABLE 5.5.2-11

Incremental Change in Projected Indirect and Induced Employment in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
STATE OF ALASKA	Number	2,900	9,300	18,600	19,600	11,800	5,900	9,000	11,400	10,200	9,500	9,500
	Percent	0.6%	1.7%	3.5%	3.6%	2.1%	1.1%	1.6%	2.0%	1.7%	1.5%	1.3%
INSIDE PIPELINE CORRIDOR												
North Slope Borough	Number	10	30	150	340	440	830	1,630	1,790	1,590	1,460	1,400
	Percent	0.1%	0.2%	1.1%	2.5%	3.2%	5.8%	11.0%	9.1%	8.4%	6.7%	5.5%
Yukon-Koyukuk Census Area	Number	0	30	140	140	60	20	20	20	20	20	20
	Percent	0.0%	1.3%	4.9%	4.5%	1.7%	0.6%	0.6%	0.6%	0.6%	0.5%	0.7%
Fairbanks North Star Borough	Number	10	640	1,700	1,600	880	560	610	710	650	600	630
	Percent	0.0%	1.0%	2.5%	2.4%	1.3%	0.8%	0.9%	1.0%	0.9%	0.8%	0.8%
Southeast Fairbanks Census Area	Number	0	30	100	100	40	10	20	20	20	20	20
	Percent	0.0%	0.6%	2.1%	2.1%	0.8%	0.2%	0.4%	0.4%	0.4%	0.3%	0.3%
Inside Pipeline Corridor Total	Number	20	730	2,090	2,180	1,430	1,430	2,270	2,540	2,280	2,090	2,080
	Percent	0.0%	0.8%	2.3%	2.4%	1.6%	1.5%	2.3%	2.5%	2.2%	1.9%	1.8%
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	Number	0	20	70	70	30	10	20	20	20	20	30
	Percent	0.0%	0.6%	2.2%	2.2%	0.9%	0.3%	0.6%	0.6%	0.6%	0.5%	0.8%
Municipality of Haines Borough	Number	0	10	30	30	10	0	0	0	0	0	10
	Percent	0.0%	0.6%	1.7%	1.6%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Kenai Peninsula Borough	Number	20	320	970	920	400	190	270	350	310	330	380
	Percent	0.1%	1.1%	3.2%	3.0%	1.3%	0.6%	0.9%	1.1%	0.9%	1.0%	1.0%
Matanuska-Susitna Borough	Number	100	800	2,460	2,460	1,190	540	590	800	790	880	1,030
	Percent	0.3%	1.7%	5.0%	5.1%	2.5%	1.1%	1.2%	1.7%	1.5%	1.4%	1.3%
Municipality of Anchorage	Number	2,720	7,100	11,600	12,530	8,220	3,590	5,730	7,550	6,580	5,990	5,740
	Percent	1.1%	2.7%	4.3%	4.6%	3.0%	1.3%	2.0%	2.5%	2.1%	1.8%	1.5%
Municipality of Skagway Borough	Number	0	20	70	70	30	10	10	20	20	20	20
	Percent	0.0%	1.7%	5.8%	5.8%	2.5%	0.8%	0.8%	1.5%	1.4%	1.2%	1.1%
Valdez-Cordova Census Area	Number	0	20	70	70	30	10	10	20	20	20	20
	Percent	0.0%	0.3%	1.0%	1.0%	0.4%	0.1%	0.1%	0.3%	0.3%	0.3%	0.3%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

Table 5.5.2-12 shows the projected indirect and induced change in employment resulting from the combined direct and indirect effects of the Project during the construction phase. A portion of this indirect and induced change in the number of jobs would be directly associated with Project construction, while another portion would be caused by the additional economic development expected to occur during the construction phase as a result of the Project. As described in Section 5.3, the commencement of Project construction is anticipated to result in increased exploration for oil and gas on the North Slope, with additional oil production occurring as soon as 2021, if such action is approved by federal and state authorities. This additional oil production would result in increased state and local government spending, which would increase employment in the state.

As shown in Table 5.5.2-12, the largest percent increase in indirect and induced jobs is expected to occur in the North Slope Borough. Project construction, together with the increase in North Slope oil and gas exploration that is expected to be triggered by the Project, would require the services of a number of oil and gas industry firms currently located at Deadhorse, and these firms would likely add staff to meet the demand. In addition, the North Slope Borough would start receiving additional property taxes after pipe and equipment for the Project is delivered to North Slope construction sites. This additional local government revenue is expected to generate additional jobs in the borough.

Table 5.5.2-13 shows the estimated payroll of the Project during the construction phase, including labor and overtime pay. It is estimated that the total Project construction payroll could range from approximately $4.0 billion to nearly $5.2 billion in nominal dollars with a peak year payroll of more than $1.34 billion to $1.75 billion in 2018. The payroll amounts shown by borough and census area reflect the location where the construction work would be accomplished each year. As a result of the planned work camps for field crews working on the Project, only a limited amount of worker payroll would be spent in communities in proximity to the Project. Nevertheless, wages paid to Alaska residents would contribute to the local economies of the communities in which the residents reside. It is estimated that approximately $1.1 billion to $2.2 billion of the total construction payroll would be received by Alaska residents. Based on information on personal income and disposable personal income for Alaska (U.S. Department of Commerce 2011), it is estimated that the payroll of the Project during the construction phase would generate approximately $1.0 billion to $2.0 billion in disposable income for Alaska residents.

[Note: Employment Outside Pipeline Corridor will be provided in final report. Employment in these areas will include direct labor employment at ports used by the APP and staff employment in these boroughs and census areas.]

Table 5.5.2-14 presents the projected indirect and induced per capita income change that would result from the combined direct and indirect effects of the Project. A portion of this indirect and induced income change would be directly associated with the Project construction (i.e., direct effect), while another portion would be generated by the additional economic activity expected to occur during the construction phase as a result of the Project (i.e., indirect and induced effects). As shown in Table 5.5.2-14, the construction phase of the Project would result in only a small change in per capita income relative to the No Action Alternative.

TABLE 5.5.2-12

Incremental Change in Projected Indirect and Induced Employment in Borough and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
State of Alaska	Number	7,200	13,200	25,300	26,000	19,400	14,400	23,800	29,300	41,900	39,500	46,700
	Percent	1.4%	2.5%	4.7%	4.8%	3.5%	2.6%	4.2%	5.0%	7.0%	6.0%	6.5%
Inside Project Corridor												
North Slope Borough	Number	420	590	1,150	1,800	2,390	3,050	4,040	4,030	4,730	4,400	3,640
	Percent	3.3%	4.5%	8.6%	13.3%	17.3%	21.3%	27.2%	20.5%	24.9%	20.1%	14.4%
Yukon-Koyukuk Census Area	Number	10	40	140	150	70	30	970	1,130	1,200	1,290	1,280
	Percent	0.4%	1.7%	4.9%	4.9%	2.0%	0.9%	29.0%	32.8%	34.0%	35.3%	47.4%
Fairbanks North Star Borough	Number	370	1,020	2,360	2,460	2,010	2,800	3,490	2,450	2,740	2,540	2,930
	Percent	0.6%	1.6%	3.6%	3.8%	3.1%	4.3%	5.3%	3.6%	4.0%	3.6%	4.0%
Southeast Fairbanks Census Area	Number	10	40	120	120	60	30	540	570	580	600	640
	Percent	0.2%	0.9%	2.6%	2.6%	1.3%	0.6%	11.5%	11.9%	11.9%	11.6%	11.7%
Outside Project Corridor												
Denali Borough	Number	10	30	80	90	50	30	80	80	100	70	100
	Percent	0.3%	1.0%	2.6%	2.9%	1.6%	0.9%	2.5%	2.5%	3.0%	1.9%	2.6%
Municipality of Haines Borough	Number	0	10	30	30	20	20	40	40	50	40	40
	Percent	0.0%	0.6%	1.7%	1.7%	1.1%	1.1%	2.2%	2.1%	2.5%	1.8%	1.5%
Kenai Peninsula Borough	Number	310	740	1,500	1,560	1,120	1,470	2,040	1,910	2,330	2,080	1,450
	Percent	1.2%	2.7%	5.3%	5.4%	3.7%	5.1%	7.0%	6.3%	7.6%	6.5%	4.1%
Matanuska-Susitna Borough	Number	1,740	2,110	3,780	2,750	1,570	940	1,870	2,320	3,060	3,180	4,570
	Percent	4.8%	4.8%	8.4%	6.0%	3.4%	2.0%	3.8%	5.1%	6.1%	5.3%	6.3%
Municipality of Anchorage	Number	4,310	8,540	13,360	13,870	9,860	4,230	9,070	14,670	22,110	19,590	25,730
	Percent	1.7%	3.3%	5.2%	5.4%	3.8%	1.6%	3.3%	5.2%	7.6%	6.1%	7.4%
Municipality of Skagway Borough	Number	0	0	10	20	20	10	10	10	20	20	30
	Percent	0.0%	0.0%	0.8%	1.7%	1.7%	0.8%	0.8%	0.8%	1.4%	1.3%	1.7%
Valdez-Cordova Census Area	Number	10	20	80	80	50	30	70	30	50	50	60
	Percent	0.1%	0.3%	1.2%	1.2%	0.7%	0.4%	1.0%	0.4%	0.7%	0.7%	0.8%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

TABLE 5.5.2-13

Projected Project Construction Payroll in Borough and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Billions of Nominal $							
	2015	2016	2017	2018	2019	2020	2021	Total
STATE OF ALASKA								
INSIDE PIPELINE CORRIDOR								
North Slope Borough	0.06-0.08	0.22-0.28	0.46-0.60	0.53-0.69	0.47-0.61	0.10-0.13.	0.03-0.04	1.85-2.4
Yukon-Koyukuk Census Area	0.00-0.00	0.09-0.11	0.38-0.50	0.36-0.47	0.10-0.13	0.05-0.06	0.00-0.00	0.97-1.27
Fairbanks North Star Borough	0.00-0.00	<0.01	0.01-0.02	0.14-0.18	0.16-0.22	<0.01	0.00-0.00	0.33-0.44
Southeast Fairbanks Census Area	0.00-0.00	0.07-0.09	0.32-0.42	0.31-0.40	0.06-0.08	0.04-0.05	0.00-0.00	0.81-1.05
Inside the Pipeline Corridor Total	0.06-0.08	0.38-0.49	1.18-1.54	1.34-1.75	0.79-1.03	0.19-0.25	0.03-0.04	3.96-5.18
OUTSIDE PIPELINE CORRIDOR								
Denali Borough	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Municipality of Haines Borough	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Kenai Peninsula Borough	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Matanuska-Susitna Borough	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Municipality of Anchorage	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Municipality of Skagway Borough	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Valdez-Cordova Census Area	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD	TBD	

Source: Northern Economics (2011)

TABLE 5.5.2-14

Incremental Change in Projected Per Capita Income in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
STATE OF ALASKA	Number	377	768	1,414	1,342	748	196	777	489	589	(1,800)	(1,078)
	Percent	0.6%	1.2%	2.2%	1.9%	1.0%	0.3%	1.0%	0.5%	0.5%	-1.0%	-0.4%
INSIDE PIPELINE CORRIDOR												
North Slope Borough	Number	631	952	2,563	4,220	3,451	2,090	(1,033)	(7,314)	(16,818)	(16,524)	(25,831)
	Percent	1.0%	1.4%	3.6%	5.8%	4.5%	2.8%	-1.3%	-10.0%	-18.2%	-13.4%	-14.6%
Yukon-Koyukuk Census Area	Number	48	208	599	564	168	22	3,564	1,605	(1,122)	(5,355)	(8,497)
	Percent	0.1%	0.5%	1.3%	1.2%	0.3%	0.0%	6.3%	2.4%	-1.4%	-4.3%	-4.1%
Fairbanks North Star Borough	Number	116	429	1,041	948	561	869	1,232	87	(17)	(382)	912
	Percent	0.2%	0.7%	1.7%	1.5%	0.8%	1.3%	1.7%	0.1%	0.0%	-0.2%	0.4%
Southeast Fairbanks Census Area	Number	50	210	623	568	265	164	3,164	2,147	807	(1,353)	(2,381)
	Percent	0.1%	0.4%	1.1%	0.9%	0.4%	0.3%	4.7%	2.7%	0.8%	-0.9%	-0.9%
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	Number	203	414	486	1,016	563	125	1,155	1,642	2,655	2,020	1,299
	Percent	0.4%	0.7%	0.8%	1.6%	0.8%	0.2%	1.5%	1.8%	2.3%	1.1%	0.4%
Municipality of Haines Borough	Number	19	170	413	365	76	(129)	236	(18)	(519)	(1,142)	(901)
	Percent	0.0%	0.3%	0.6%	0.5%	0.1%	-0.2%	0.3%	0.0%	-0.4%	-0.6%	-0.3%
Kenai Peninsula Borough	Number	237	522	1,046	1,105	801	1,009	1,627	783	816	(1,258)	(2,073)
	Percent	0.5%	0.9%	1.8%	1.7%	1.2%	1.4%	2.2%	0.9%	0.7%	-0.7%	-0.7%
Matanuska-Susitna Borough	Number	465	625	1,159	771	221	(153)	356	388	439	(1,001)	(161)
	Percent	0.9%	1.1%	2.0%	1.3%	0.3%	-0.2%	0.5%	0.5%	0.5%	-0.7%	-0.1%
Municipality of Anchorage	Number	626	1,282	2,008	1,964	1,093	(59)	888	1,065	1,262	(2,571)	(1,020)
	Percent	0.9%	1.8%	2.7%	2.5%	1.3%	-0.1%	1.0%	1.0%	1.0%	-1.3%	-0.3%
Municipality of Skagway Borough	Number	82	(336)	1,076	500	1,068	287	477	84	393	(1,328)	(1,196)
	Percent	0.1%	-0.4%	1.4%	0.6%	1.3%	0.3%	0.6%	0.1%	0.3%	-0.8%	-0.4%
Valdez-Cordova Census Area	Number	24	166	480	554	295	125	404	159	185	(66)	277
	Percent	0.0%	0.3%	0.7%	0.8%	0.4%	0.2%	0.5%	0.2%	0.2%	0.0%	0.1%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics, Inc. 2011

The influx of capital and labor to Alaska as a result of Project construction could lead to inflationary pressure and effects on prices of goods and services for residents in some Alaska communities. In addition, there is the potential for other industrial projects to be underway during the Project construction which could contribute to high demands for labor, goods, and services and potentially contribute to local inflation. The higher prices for goods and services caused by this inflationary pressure would reduce the real income of those whose incomes do not rise as fast as the price level, such as lower and fixed income residents not employed by the Project.

Operations Phase

APP will initially staff GTP operations with a core team of experienced workers from the Project sponsoring companies, coupled with experienced local hires and trained new hires. It is intended that local hires would progressively replace non-local workers over time as they achieve the required skill levels and gain sufficient experience. On-site operations staff will include approximately 200 workers. Another 200 workers will be on off-rotation, and approximately 100 workers would comprise off-site support.

APP anticipates that operation and maintenance of the pipelines, meter stations, and compressor stations would require approximately 35 to 50 full-time workers in Alaska, comprised of trades technicians, technical specialists, safety personnel, support staff, and management. Additional engineering, maintenance, and management support will be provided by the Project sponsoring companies.

Current information indicates the number of qualified local people may not be sufficient to fill operating and maintenance manpower requirements, and recruitment programs will be required in advance of Project start-up. APP anticipates it will recruit local people in 2015 to start training in preparation for operations in 2020. The field trainees will be trained at existing Project sponsoring companies' sites for the first two years and then will support commissioning and start-up of the APP as required. The balance of experienced technicians required will be supplemented from Project sponsoring companies' operations teams and will likely be phased out over time as local people gain experience over 5-10 years during operations.

With respect to the projected indirect and induced change in employment that would result from the combined direct and indirect effects of the Project during the operations phase, Table 5.5.2-12 shows that the Project would generate more employment than the No-Action Alternative due to the higher level of economic activity and corresponding higher state and local government spending described in Section 5.3. It is estimated that by 2030 an additional 41,900 jobs would be created statewide (Table 5.5.2-12).

If the residency pattern of the 400 on-site and off-rotation GTP workers is similar to the current residency pattern for North Slope workers in the vicinity of Prudhoe Bay, most of the workers would reside in Southcentral Alaska (56 percent) or outside of Alaska (36 percent). About four percent would live in Fairbanks (ADOLWD 2010). The off-site support staff are anticipated to be located in Anchorage, but final location will be determined in a later phase.

As shown in Table 5.5.2-14, the operations phase of the Project would result in only a small change in per capita income in Alaska as a whole. However, a substantial decrease in per capita income is expected in the North Slope Borough. The reason for this decline is that during the operations phase, the North Slope Borough government would receive more revenue

relative to the No Action Alternative because of the larger property tax base. The local government is expected to use this additional revenue to hire more employees, but employment and payroll statistics suggest that these government employees would be paid less than they would be in private sector jobs. According to ADOLWD (2011a), private sector average month wages in the first quarter of 2011 in the North Slope Borough was $8,263, while the average monthly wages in the local government sector was $3,936. Further, the description of the Project impacts on population noted that a large increase in the resident population is expected to occur in the North Slope Borough. As a result of the combination of lower paying government jobs and a higher population, per capita income would decrease.

[Note: Estimated payroll during the operations phase will be included in the final report.]

Purchases of Goods and Services

Development Phase

As noted in the description of employment and income impacts, it is anticipated that there would be increased economic activity in the professional and business services sector and other related sectors, as well as appraisal work and transactions related to right-of-way acquisition, and payroll for Project employees. There would be a about $62 million to $120 million spent annually during the development phase. It is anticipated that the increase in economic activity would be concentrated in Anchorage where most of Alaska's professional and business services firms are located.

Construction Phase

Direct materials expenditures related to Project construction would have an immediate impact on Alaska's economy; however, major material items, such as steel pipe, would be manufactured out of state or globally and shipped via marine transport to Alaska ports. The Project would purchase food, fuel, and other supplies from Alaska providers where practicable. With the exception of Fairbanks, the communities inside the pipeline corridor are small, and the amount of goods that could be supplied by these businesses to the Project are expected to be minimal. Businesses located in Fairbanks and Anchorage would be the likely sources of most Alaska-sourced supplies. To the extent that Project construction workers spend money in local hotels, restaurants, and shops, the level of business activity in communities in the pipeline corridor would increase during the time the workers are in the communities (U.S. Department of Energy 2007). The effect of these expenditures on retailers would be concentrated in the larger communities, such as Delta Junction, Tok, and Fairbanks, because there are few retail and service outlets in the smaller communities. A large amount of the construction materials needed would be purchased out-of-state, Alaska wholesale trade, water, air and truck transportation sectors would benefit from these purchases.

While some Alaska businesses would benefit from increased sales to the Project, a portion of these businesses may expand to meet construction demand, only to be non-viable in the long-term when construction-related demand decreased. Opportunities for expansion of businesses would require careful planning to ensure long-term viability.

As shown in Table 5.5.2-15, during the construction phase of the Project an estimated $5.02 billion to $6.55 billion of goods and services would be purchased from Alaska businesses, and about $9.01 billion to $11.78 billion of goods and services would be purchased from firms in

other states. In addition, an estimated $9.25 billion to $12.08 billion of construction materials would be purchased from other countries.

TABLE 5.5.2-15

Projected Construction Purchases of Goods and Services in the State of Alaska and Other U.S. States

	Billions of Nominal $							
	2015	2016	2017	2018	2019	2020	2021	Total
State of Alaska	0.23-0.30	0.76-0.99	1.42-1.85	1.48-1.93	0.85-1.11	0.24-0.32	0.04-0.05	5.02-6.55
Other U.S. States	0.70-0.92	1.68-2.20	2.50-3.27	2.23-2.91	1.33-1.74	0.44-0.57	0.13-0.18	9.01-11.78
Rest of the World	0.67-0.87	2.93-3.83	2.91-3.80	1.75-2.29	0.52-0.69	0.23-0.30	0.23-0.31	9.25-12.08

Source: Northern Economics (2011),

The Alaska Mainline and PT Pipeline routes have been aligned to avoid direct impacts on occupied businesses. It is not anticipated that any relocation of occupants of these types of structures would be necessary for the construction of the pipelines or ancillary facilities. Localized and short-term impacts on business activity during the construction phase, which may include an increase of heavy-duty equipment and trucks, could result in slower travel times along the roads and highways adjacent to the Project. When using the major highway transportation corridors in Alaska there could be some impact to tourism businesses during the summer months. While construction schedules would temporarily disrupt local highway and road patterns, substantial construction during the winter months would minimize the effects on tourism schedules and businesses. [Note: This preliminary text may be revised in the final report based on information presented in the Logistics Plan.]

Operations Phase

[Note: Estimated materials purchases during the operations phase will be included in the final report.]

Economic Value of Removal of Agricultural/Pasture Land or Timberland from Production

The acreage of agricultural lands that would be temporarily removed from production estimated to be 385 acres during construction, and 215 acres during operations. The acreage of timberland removed from production are estimated to be 675 acres during construction, and 385 acres during operations. Generally, these acres would include a right-of-way cleared for construction and pipeline operations over the Project life, and also adjacent road clearing, borrow pits, and potential vegetation removal for fire hazard reduction, access routes, etc. [Note: Evaluation of economic value of removal will be provided in the final report.]

5.5.3 HOUSING

5.5.3.1 Existing Conditions

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 248,421 housing units in the boroughs and census areas within the immediate region of influence in 2010 (Table 5.5.3-1). Of the total housing units, 211,855 (85.3 percent) were occupied and 36,566 (14.7 percent) were vacant. Overall, occupancy rates in these boroughs and census areas were lower than the state average. Anchorage and the Fairbanks North Star

Borough, two of most urbanized areas in the immediate region of influence, had the highest occupancy rates. Housing market conditions in these urban areas tend to be tighter than in the rural areas. Median monthly rent in the boroughs and census areas within the immediate region of influence was generally less than the median monthly rent in Alaska, but rent was higher than the median state rent in the municipalities of Anchorage and Skagway. The Denali Borough had the lowest median monthly rent at $510.

TABLE 5.5.3-1

General Housing Characteristics in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Number of Units (2010)	Occupied Units (%) (2010)	Median Value of Owner Occupied Units ($) (2005-2009)	Median Gross Rent ($) (2005-2009)	Number of Hotels. Motels, RV Parks and Campgrounds
STATE OF ALASKA	306,967	84.1	221,300	949	
INSIDE PIPELINE CORRIDOR					
North Slope Borough	2,500	81.2	143,400	931	~11
Yukon-Koyukuk Census Area	4,038	54.9	89,900	659	~9
Fairbanks North Star Borough	41,783	87.2	198,200	946	~25
Southeast Fairbanks Census Area	3,915	65.6	159,300	875	~35
OUTSIDE PIPELINE CORRIDOR					
Denali Borough	1,771	45.5	167,000	510	~40
Municipality of Haines Borough	1,631	70.4	186,300	719	~22
Kenai Peninsula Borough	30,578	72.5	183,000	770	~20
Matanuska-Susitna Borough	41,329	77.0	205,000	896	~68
Municipality of Anchorage	113,032	95.0	255,900	989	~75
Municipality of Skagway Borough	636	68.6	259,800	1,002	~10
Valdez-Cordova Census Area	6,102	65.0	163,700	756	~38
Other – City of Unalaska	1,106	84.0	266,100	1,390	~4

Source: U.S. Census Bureau, 2010 Census (2011); Alaska Department of Commerce, Community and Economic Development (ADCCED) (2011c).

As shown in Table 5.5.3-2, of the vacant housing units within the immediate region of influence, the large majority were for seasonal, recreational, or occasional use. Temporary housing is also available in the form of daily, weekly, and monthly rentals in motels, hotels, campgrounds, and recreational vehicle parks. Table 5.5.3-2 shows the approximate number of visitor accommodations in the affected communities by borough and census area. The availability of these accommodations may vary, particularly during any tourist season, local event, or because of demand for housing by other industries (e.g., mining).

TABLE 5.5.3-2

Vacant Housing Characteristics in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Number of Vacant Units (2010)	Units for Sale (%) (2010)	Units for Rent (%) (2010)	Vacant for Seasonal, Recreational, or Occasional Use (%) (2010	Other Vacant (%) (2010)
STATE OF ALASKA	48,909	5.9	13.8	57.0	19.9
INSIDE PIPELINE CORRIDOR					
North Slope Borough	471	0.6	24.6	33.3	37.6
Yukon-Koyukuk Census Area	1,821	0.8	5.9	65.6	26.4
Fairbanks North Star Borough	5,342	9.5	28.1	31.4	27.8
Southeast Fairbanks Census Area	1,348	3.1	14.8	53.7	23.0
OUTSIDE PIPELINE CORRIDOR					
Denali Borough	965	2.4	5.2	77.1	14.0
Municipality of Haines Borough	482	3.7	10.0	71.6	13.5
Kenai Peninsula Borough	8,417	4.8	7.8	72.3	13.0
Matanuska-Susitna Borough	9,505	5.6	6.2	71.8	14.5
Municipality of Anchorage	5,700	14.9	30.0	26.3	22.7
Municipality of Skagway Borough	200	2.0	7.5	24.0	65.5
Valdez-Cordova Census Area	2,136	2.4	11.5	62.8	20.8
Other – City of Unalaska	179	3.4	18.4	19.6	38.5

Source: U.S. Census Bureau, 2010 Census (2011).

The community inside the pipeline corridor with the largest number of housing units is the City of Fairbanks, with 13,056 total units in 2010. The number of housing units in other pipeline corridor communities was considerably smaller. For example, there are 11 housing units in Coldfoot. The proportion of units occupied averaged 57 percent in the pipeline corridor communities in the Yukon-Koyukuk and Southeast Fairbanks census areas, while the proportion of units occupied averaged 85 percent in the Fairbanks North Star and North Slope boroughs. Motels and other types of temporary housing in pipeline corridor communities are concentrated in those communities with tourist industries, such as Fairbanks, Tok, and Delta Junction. In the pipeline corridor communities, the percentage of vacant housing units for sale in 2010 exceeded five percent only in North Pole (25 percent) and Fairbanks (15.2 percent).

A number of organizations administer housing assistance programs that provide affordable housing for low-income Alaska Native families. A table listing those organizations that offer housing services for Alaska Natives residing in communities within the immediate region of influence is included in Appendix 5A.

5.5.3.2 Impacts and Mitigation

No Action Alternative

Housing stock in Alaska is projected to increase from 292,000 housing units in 2015 to 450,200 in 2050 to meet increased population growth and household formation. Most of the increase would occur in Southcentral Alaska, primarily in the Matanuska-Susitna Borough and the Municipality of Anchorage, which would account for about 273,000 of the total housing stock in 2050.

TABLE 5.5.3-3

Projected Housing in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – No Action Alternative

	Number of Housing Units					
	2015	2020	2025	2030	2040	2050
STATE OF ALASKA	292,320	322,300	347,800	369,800	402,800	450,200
INSIDE PIPELINE CORRIDOR						
North Slope Borough	3,570	3,300	3,690	4,020	4,350	4,550
Yukon-Koyukuk Census Area	2,210	2,460	2,710	2,920	3,190	2,960
Fairbanks North Star Borough	40,530	43,850	46,380	48,710	51,020	54,510
Southeast Fairbanks Census Area	3,640	4,220	4,650	4,990	5,520	6,180
OUTSIDE PIPELINE CORRIDOR						
Denali Borough	790	800	810	820	840	870
Municipality of Haines Borough	1,210	1,340	1,450	1,570	1,770	2,040
Kenai Peninsula Borough	23,620	25,070	26,890	28,590	31,670	36,810
Matanuska-Susitna Borough	41,060	50,970	58,040	63,930	74,510	89,730
Municipality of Anchorage	120,520	131,630	142,210	151,000	164,330	183,230
Municipality of Skagway Borough	540	680	800	910	1,080	1,280
Valdez-Cordova Census Area	4,090	4,290	4,450	4,570	4,760	5,120
Other – City of Unalaska	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011).

Project

Development Phase

Development impacts include the additional housing requirements for employees of the sponsoring firms that would move to Alaska for work on the Project. At present, most of the employees that moved to Alaska for the development phase of the project are located in Anchorage. The number of such employees and contractors is expected to continue to be small in comparison to the total housing stock available in Anchorage, where most of the Project employees and contractors during the development phase would be located.

Construction Phase

The effects of construction of the Project on housing in the immediate region of influence would be minimal because the majority of Project construction crews would be housed in temporary construction camps and on a daily basis would be transported from the camps to Project work sites. Project construction crews, whether Alaska residents or non-residents, would travel to or

from their residences to Anchorage or Fairbanks at the beginning and end of the construction season, or whenever their specific occupational skills are needed. From Anchorage or Fairbanks they would be transported by air or ground to the various construction camps. It is anticipated that some of the Project logistics personnel would stay in hotels/motels in communities along the transportation routes used to transport materials and equipment to Project work sites. The existing hotels/motels would be able to accommodate the anticipated number of personnel, although during the summer tourist season vacancies could be very low or non-existent.

It is not anticipated that any relocation of housing unit occupants would be necessary for the construction of the Project. The Alaska Mainline and PT Pipeline routes have been aligned to avoid direct impacts on residences. Refer to Section 8.2.3.1 in Resource Report 8 for additional discussion of Project effects on residential land.

During early construction of the GTP, approximately 270 construction personnel would be housed at available hotels and contractor-owned facilities in Deadhorse. Staff would commute daily to the GTP work locations via contractor-provided bus service and typical construction crew cab trucks. Part of the work of the early construction crews would be construction of an 800-person construction camp that would house the larger construction crews for the GTP.

Table 5.5.3-4 shows the combined direct and indirect effects of the Project on housing demand in the immediate region of influence and the state as a whole during the construction phase. The largest percent change in housing demand could occur in the North Slope Borough. Project construction, together with the increase in North Slope oil and gas exploration that could be triggered by the Project, would generate additional jobs in the borough, thereby leading to population growth and increased demand for housing. The additional economic activity and jobs the Project would generate in the Fairbanks North Star Borough and Municipality of Anchorage are expected to result in a substantial increase in local demand for housing in absolute terms, but the increase in percentage terms would be minor due to the large existing housing supply in the borough and municipality.

TABLE 5.5.3-4

Incremental Change in Projected Housing Units in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska – Direct and Indirect Effects of Project

Area	Incremental Change	Construction Phase							Operations Phase			
		2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
STATE OF ALASKA	Number	1,300	2,300	4,100	5,800	6,700	7,300	8,700	13,300	20,100	27,800	30,400
	Percent	0.5%	0.8%	1.3%	1.9%	2.1%	2.3%	2.7%	3.8%	5.4%	6.9%	6.7%
INSIDE PIPELINE CORRIDOR												
North Slope Borough	Number	40	50	80	120	160	190	220	280	270	230	160
	Percent	1.4%	1.7%	2.7%	3.9%	5.0%	5.8%	6.5%	7.6%	6.7%	5.3%	3.5%
Yukon-Koyukuk Census Area	Number	0	10	30	50	60	60	120	370	630	920	930
	Percent	0.0%	0.5%	1.3%	2.2%	2.5%	2.4%	4.8%	13.7%	21.6%	28.8%	31.4%
Fairbanks North Star Borough	Number	130	220	470	710	850	1,080	1,370	1,810	2,180	2,330	2,370
	Percent	0.3%	0.5%	1.1%	1.7%	2.0%	2.5%	3.1%	3.9%	4.5%	4.6%	4.3%
Southeast Fairbanks Census Area	Number	10	0	20	30	40	40	90	270	440	610	710
	Percent	0.3%	0.0%	0.5%	0.8%	1.0%	0.9%	2.1%	5.8%	8.8%	11.1%	11.5%
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	Number	0	0	10	0	0	10	10	0	0	10	20
	Percent	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%	1.3%	0.0%	0.0%	1.2%	2.3%
Municipality of Haines Borough	Number	0	0	10	10	10	10	20	30	50	40	50
	Percent	0.0%	0.0%	0.8%	0.8%	0.8%	0.7%	1.5%	2.1%	3.2%	2.3%	2.5%
Kenai Peninsula Borough	Number	70	140	270	410	500	610	780	1,330	1,890	2,530	2,490
	Percent	0.3%	0.6%	1.1%	1.7%	2.0%	2.4%	3.1%	4.9%	6.6%	8.0%	6.8%
Matanuska-Susitna Borough	Number	450	650	1,030	1,320	1,500	1,580	1,820	2,570	3,830	5,240	6,110
	Percent	1.1%	1.5%	2.3%	2.8%	3.1%	3.1%	3.4%	4.4%	6.0%	7.0%	6.8%
Municipality of Anchorage	Number	610	1,090	1,860	2,580	2,960	2,960	3,460	5,590	9,340	12,800	14,050
	Percent	0.5%	0.9%	1.5%	2.0%	2.3%	2.2%	2.6%	3.9%	6.2%	7.8%	7.7%
Municipality of Skagway Borough	Number	0	0	0	10	0	0	10	10	10	30	30
	Percent	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	1.4%	1.3%	1.1%	2.8%	2.3%
Valdez-Cordova Census Area	Number	10	10	10	20	20	30	40	40	60	70	60
	Percent	0.2%	0.2%	0.2%	0.5%	0.5%	0.7%	0.9%	0.9%	1.3%	1.5%	1.2%
Other – City of Unalaska	Number	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Percent	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Source: Northern Economics (2011)

Operations Phase

As noted in the description of employment and income impacts, only about 35 to 50 full-time workers would be required to operate, inspect, and conduct routine maintenance on the pipelines and related facilities. Moreover, it is anticipated that a portion of the new workers would be drawn from the labor pool in the pipeline corridor region.

Also as noted earlier, on-site operations staff at the GTP would include approximately 200 workers. Another 200 workers would be off-rotation, and about 100 workers would make up off-site support, for a total of 500 workers. Most of the GTP on-site operations staff are anticipated to reside in Southcentral Alaska with a minor percentage in Fairbanks and other areas of the state, similar to existing residency patterns of North Slope workers. The off-site support staff may be located in Fairbanks, Anchorage, or other locations of the APP Project sponsoring companies.

APP would initially staff GTP operations with a core team of experienced employees from the Project-sponsoring companies, coupled with trained new hires and experienced local hires. To the extent that the new hires and experienced local hires are residents of Alaska, the demand on housing would be lessened.

5.5.4 LOCAL INFRASTRUCTURE AND PUBLIC SERVICES

5.5.4.1 Existing Conditions

This section contains a discussion of the existing local infrastructure and public services within the immediate region of influence. A wide range of public services and facilities are offered in the immediate region of influence, with concentrations in the larger cities. Where services are not available at the local level, they are available from the borough or state. Services provided in the immediate region of influence 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 APP that will also address medical and public safety. The document will be submitted directly to FERC in October 2012 and is not included in Resource Report 5.

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 is on the order of 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.

Law Enforcement/Fire/Medical Services

Police services in a few boroughs and communities in the immediate region of influence are provided by local police departments; however, law enforcement in most rural areas of the state is the primary responsibility of the Division of Alaska State Troopers under the Alaska Department of Public Safety (Alaska Department of Public Safety 2011a). The Division is

composed 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 investigates major crimes; the Alaska Bureau of Alcohol and Drug Enforcement enforces bootlegging and illegal drug distribution throughout Alaska; the Alaska Bureau of Judicial Services is responsible for prisoner transports and providing security for Alaska courts; and the Alaska Bureau of Highway Patrol is responsible for highway safety (Alaska Department of Public Safety 2011a). A complete listing of police and fire protection services in the communities in the immediate region of influence is provided in Appendix 5A.

Alaska State Troopers promptly respond to emergencies, felony, and misdemeanor cases. Their efforts, however, are often hampered by delayed notification, long response distance, and the uncertainties of weather and transportation. In some rural villages Village Public Safety Officers (VPSOs) assist their communities in all aspects of public safety, including law enforcement, fire protection, and search and rescue (Alaska Department of Public Safety 2011b). VPSOs are employed by Alaska Native non-profit corporations and supervised by the Alaska State Troopers. In communities associated with the VPSO Program, citizens are afforded immediate response to all emergencies without delays caused by weather, distance, or budgetary restraints. Although VPSOs are not expected to handle high-risk or complex investigative situations, they are the "First Responders" to all volatile situations in their communities. Part of their job involves stabilizing volatile situations and protecting crime scenes until the State Troopers can arrive. VPSOs frequently conduct and complete misdemeanor and minor felony investigations with assistance provided by the State Troopers (Alaska Department of Public Safety 2011b). For those communities without a police department, VPSO, or Alaska State Trooper post, the closest law enforcement facility is listed in the table in Appendix 5A. All communities in the immediate region of influence are covered by emergency “911” service.

While some communities in the immediate region of influence have fire departments staffed with career firefighters, fire protection services in most communities are provided by volunteers. 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 is the focal point for coordinating and providing support for all-hazard emergency response activities for federal landholding agencies in Alaska (Alaska Interagency Coordination Center 2011). 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 2011).

There are six major hospitals in the immediate region of influence – three in Anchorage, and one each in Fairbanks, Palmer and Barrow. Health clinics are located in the majority of other communities in the immediate region of influence, but trauma cases, as well as serious illness cases, must be sent to hospitals. Transport in emergency situations is usually by air (i.e., airplane or helicopter). Communities in the immediate region of influence with air medical services include Anchorage, Fairbanks, Barrow, and Tok. Most communities provide emergency medical services, which, in many cases, are delivered by local fire departments. A

number of regional and community organizations administer health and social service programs for Alaska Natives.

A complete listing of medical services in the communities in the immediate region of influence is provided in Appendix 5A.

Schools

Information regarding the number of schools in communities within the immediate region of influence, and the grade levels and student enrollment at those schools, is shown in Appendix 5A. The highest number of schools is in Anchorage and Fairbanks. The 123 schools in these population centers had 58,551 students enrolled in 2011. Alaska schools vary greatly in size. High schools in Anchorage may serve more than 2,000 students. Schools in other urban areas such as Fairbanks, the Kenai Peninsula, or the Matanuska-Susitna Borough may serve hundreds and are similar to schools in small cities in the rest of the United States. In contrast, many schools in rural areas are small, some with 20 or fewer students at a variety of grade levels (Alaska Teacher Placement 2011). The State of Alaska does not provide state funds for schools with fewer than 10 students.

The State of Alaska provides parents with the option of home-schooling their children. Under state law, children schooled at home by their parents or guardians are exempt from the compulsory school attendance law. 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 August 2011, this department listed 26 correspondence schools on its web site. Of the total, 14 of the schools are available to students from all over the state, while 12 of the schools serve students in individual school districts (Alaska Department of Education and Early Development 2011b).

Table 5.5.4-1 presents the revenue per average daily membership and funding sources in school districts with affected communities. Average per student cost in Alaska is higher than in any other state, reflecting the costs associated with maintaining educational services among often extremely widely geographically dispersed communities (U.S. Department of the Interior 2002). As shown in Table 5.5.4-1, the revenue per average daily membership was highest in the North Slope Borough School District and lowest in the Matanuska-Susitna Borough 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. It 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 district with the local contributions to assure the equivalent of a 4-mill tax levy on the full assessed value of the taxable real and personal property in the district or 45 percent of prior year basic need, whichever is less (Alaska Department of Education and Early Development 2011c).

TABLE 5.5.4-1

Revenue Per Average Daily Membership and Funding Sources in the Immediate Region of Influence[1]

School District	Revenue Per Average Daily Membership ($) (2010)	Share of Funding by Source (2010)
INSIDE PIPELINE CORRIDOR		
North Slope Borough School District	35,475	45.3% local, 29.8% state, 11.6% federal, 3.3% other, 10.0% special revenue
Nenana City School District (Yukon Koyukuk Census Area)	8,321	1.2% local, 89.2% state, 0.2% federal, 1.7% other, 7.7% special revenue
Yukon Koyukuk School District	12,765	0.0% local, 65.0% state, 7.2% federal, 7.4% other, 20.5% special revenue
Fairbanks North Star Borough School District	14,429	20.8% local, 62.5% state, 5.8% federal, 0.4% other, 10.6% special revenue
Delta/Greely School District (Southeast Fairbanks Census Area)	13,159	0.0% local, 80.0% state, 3.5% federal,
Alaska Gateway School District	24,845	0.0% local, 74.4% state, 5.3% federal, 5.1% other, 15.2% special revenue
OUTSIDE PIPELINE CORRIDOR		
Denali Borough School District	14,266	26.8% local, 66.3% state, 0.3% federal, 1.1% other, 5.5% special revenue
Haines Borough School District	18,566	29.6% local, 59.4% state, 0.0% federal, 0.6% other, 10.4% special revenue
Kenai Peninsula Borough School District	14,731	31.9% local, 56.6% state, 0.3% federal, 1.5% other, 9.7% special revenue
Matanuska-Susitna Borough School District	12,371	21.3% local, 69.6% state, 0.2% federal, 0.8% other, and 7.8% special revenue
Anchorage School District	13,209	29.6% local, 55.6% state, 2.8% federal,1.3% other, 10.6% special revenue
Skagway City School District	32,884	44.3% local, 29.2% state, 0.0% federal, 1.2% other, 25.1% special revenue
Copper River School District (Valdez-Cordova Census Area)	18,523	0.0% local, 82.1% state, 3.4% federal,
Valdez City School District (Valdez-Cordova Census Area)	20,778	52.8% local, 38.1% state, 0.2% federal, 0.5% other, 8.5% special revenue

[1] Average daily membership is the average number of enrolled students during the 20 school-day count period.

Source: Alaska Department of Education and Early Development (2011a)

Utilities

Many rural communities in the immediate region of influence do not have community piped potable water or sewage treatment systems. Water in these communities is typically 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 in communities within the immediate region of influence is hauled to the borough, village council, or private 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). A table in Appendix 5A documents the provision of local utilities (water, sewer, solid waste, electric, natural gas) to communities within the immediate region of influence by identifying the local communities' service providers by utility type.

Alaska's electrical energy infrastructure differs from that in the rest of the United States in that there is no extensive infrastructure of transmission interties that span the state or connect to the grid in Canada or the contiguous United States. The electrical needs of communities in the immediate region of influence are currently served by eight utilities, consisting of five cooperatives (Golden Valley Electric Association, Chugach Electric Association, Matanuska Electric Association, Copper Valley Electric Association, and Barrow Utilities & Electric Cooperative), two municipal utilities (Anchorage Municipal Light & Power and City of Seward Electric System), and one private company (Alaska Power Company). These utilities account for nearly all of the electricity generated in the state. ENSTAR Natural Gas supplies natural gas produced in Cook Inlet to many residences and businesses in Southcentral Alaska. The Barrow Utilities & Electric Cooperative distributes piped natural gas produced on the North Slope to residences and businesses in Barrow.

The day-to-day operating costs of community water, sewer, and electric utility systems in rural Alaska are high. When the low level of per capita income in rural Alaska is taken into account, residents of those communities in Alaska that are remote and off the road system typically pay about 14 percent of their household income for gas, electric, and heating fuel, while Anchorage residents pay about 3 percent (Table 5.5.4-2). With a small customer base and limited income, many – if not most – utility systems are not self-supporting (Colt et al. 2003).

TABLE 5.5.4-2

Percentage of Household Income Spent on Gas, Electricity, and Heating Fuel

United States	4.1
State of Alaska	4.7
Anchorage	3.2
Remote Rural Alaska	14.4

Source: Saylor et al. (2008).

5.5.4.2 Impacts and Mitigation

No Action Alternative

Future demand for public infrastructure and services under the No Action Alternative in the immediate region of influence would be commensurate with increases in population. As the population increases, so would the demand for necessary public services such as utilities (gas, electric, water/sewer, dumps/landfills, and telecommunications), police and fire protection, medical services, and schools. The Municipality of Anchorage and Matanuska-Susitna Borough would experience the greatest increase in demand for public infrastructure and services, as the state's population growth is predicted to be concentrated in these areas. However, per unit costs to expand, replace or maintain public infrastructure in more rural areas would be higher 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. The day-to-day operating costs of community water, sewer, and electric utility systems in rural Alaska are also relatively high.

Project

Development Phase

The effects of development of the Project, including designing and securing regulatory approvals for the GTP, mainline, meter stations, and compressor stations, and the PT Pipeline, on public utilities in communities in the immediate region of influence would be minimal. The development phase is estimated to generate 420 to 670 part-time and full-time jobs in Alaska, most of which would be located in Anchorage. To the extent that the persons filling these jobs are Alaska residents prior to being hired, or non-residents that continue to commute from their home states to Alaska, there would be no increased demand for public services. The impacts on public services and infrastructure due to any non-residents moving to Alaska to fill these jobs would be temporary and minor.

Construction Phase

The effects of construction of the Project, including the GTP, transmission lines, meter stations and compressor stations, on public utilities in communities in the immediate region of influence would be minimal. The temporary construction camps would be self-contained, and operated and maintained throughout the pipeline and facilities construction period. In addition to housing facilities, the camps would typically be equipped with appropriate emergency medical facilities, electrical power generation, fuel storage, and facilities for sewage gathering or treatment, and waste incineration and management facilities. Potable water for the camps would be trucked in or sourced from on-site wells.

No dependents of construction workers drawn from outside the immediate region of influence are expected to live in the region. However, Alaska's population would increase during the construction phase as people migrated into the state seeking employment opportunities associated with the Project, and Alaska residents remained in the state because of the increased employment opportunities. As noted in the description of population impacts, it is anticipated that the number of school-age (under 16 years of age) children would increase by about 5,900 during the final year of the construction phase. Similar to the effects on population, most of these children would be located in Southcentral Alaska school districts that have a combined current attendance of about 40,300 students. It is not anticipated that the temporary increase in the number of school-age children would result in a demand for new schools because the students would be dispersed over many communities and within communities. However, the additional students would require additional funding by the state and local governments, and could potentially result in increased classroom sizes and higher student-teacher ratios.

Construction activities may cause increased demands on law enforcement and medical services. As with any major construction project that brings in workers from large metropolitan areas or from outside of Alaska, small communities in the immediate region of influence may experience an increase in anti-social behavior, including crimes against persons and property (U.S. Department of Energy 2007). The majority of Project construction workers would spend most of their time in construction camps; however, some of these workers would stay in communities and cities away from the camps during off-rotation leisure time. In addition, in-migration by speculative job seekers would likely create pressure on public infrastructure and services.

While law enforcement staffing is quite high in areas of concentrated population such as Fairbanks, the same cannot be said for smaller communities in the pipeline corridor (U.S. Department of Energy 2007). These small villages might have a more difficult time coping with the potential increased crime resulting from short-term residency of construction workers because law enforcement in smaller population areas lacks the public safety resources to deal with enforcement unless the state brings additional law enforcement resources to bear. It is likely that smaller communities would depend on state-provided law enforcement and social services (U.S. Department of Energy 2007).

APP would provide on-site healthcare to respond to minor medical needs for the construction workforce. Each construction crew would have trained medical staff and dedicated transportation (i.e., ambulances) to handle routine and emergency response. Illness or injuries requiring advanced medical care would be treated in existing community clinics in the immediate region of influence, and hospitals located in Barrow, Fairbanks, Palmer, and Anchorage. The increase in the demand for medical services at these facilities as a result of the Project is expected to be minor.

The level of impacts on community social services is highly dependent on the degree of in-migration of non-resident, non-specific job seekers. Information Insights (2004) notes that a large influx of people whose only reason to come to Alaska would be a speculative job search would cause substantial unanticipated impacts in communities and the state. According to Information Insights, a repeat of the level of in-migration experienced during the construction of TAPS (which came at the peak of a national recession) could overburden municipal and state service systems if out-of-state job prospectors did not find work. However, given the difficulty of predicting what the state of the U.S. economy will be in several years, there is considerable uncertainty regarding the number of people that might come to Alaska in search of jobs and Project-related business opportunities during the construction phase. Moreover, the peak number of direct jobs created by the Project would be much lower than TAPS (approximately 5,000 to 7,000 peak workforce for the pipeline, about 800 for the GTP, about 150 for each compressor station (two per year on average), and approximately 100 for each meter station or approximately 6,200 to 8,200 direct jobs for the Project compared to over 50,000 for TAPS).

Operations Phase

The new direct employment created during the operations phase would place a negligible additional demand on public facilities and services. Operation and maintenance of the pipelines, meter stations, and compressor stations would require only about 35 to 50 full-time people in Alaska. Some of these new workers would likely be drawn from the labor pool in the immediate region of influence because there are existing maintenance facilities in the region that could accommodate the new pipeline.

On-site operations staff at the GTP would include approximately 200 workers, with an additional 200 people off-site on rotation, and 100 off-site support staff. Medical facilities would be provided on the GTP site. There are currently no plans to utilize any emergency firefighting or other ancillary support from outside the GTP facility; however, the GTP would discuss the sharing of fire protection, medical, and area security services with the producers on the North Slope. GTP would have its own security services for site security. Any event beyond the capabilities of local site security would be responded to by the Alaska State Troopers' Post in

Deadhorse. As a result, APP does not foresee any impact on municipal fire protection, medical services, police, or schools in the Prudhoe Bay area.

If the residency pattern of the 400 on-site and off-rotation GTP workers is similar to the current residency pattern for North Slope workers in the vicinity of Prudhoe Bay, most of the workers would reside in Southcentral Alaska or outside of Alaska. The 100 off-site support staff might also reside in Southcentral Alaska. To the extent that the GTP workers are Alaska residents prior to being hired, or non-residents that continue to commute from their home states to the job site, there would be limited increased demand for public services. Non-residents that move to Alaska to provide the necessary experience would increase demand for public services, but the number of these non-residents are expected to be small compared to the projected population in Southcentral Alaska, where most of these individuals would likely live. Consequently, their impacts on public services would be minor.

A dedicated APP-operated water reservoir and transfer line system would provide raw water to the GTP for various uses including firewater and process water. A water treatment facility would be situated at the GTP site to provide potable water for personnel use. APP would provide sanitary wastewater and treatment systems for the GTP as well as on-site power generation to accommodate normal, essential, and emergency power needs. Solid waste generated by the GTP would be transported to, and disposed of at existing approved and permitted waste management facilities located on the North Slope. No new waste management facilities would be constructed for or by the GTP. APP would timely ship any hazardous waste generated by GTP operation through use of a licensed hazardous waste transporter via road, barge, or air, to an approved Treatment Storage and Disposal Facility outside Alaska.

5.5.5 LOCAL GOVERNMENT FINANCES

5.5.5.1 Existing Conditions

Table 5.5.5-1 identifies sources of tax revenues in the boroughs and census areas within the immediate region of influence. A large portion of the state that has not incorporated as an organized borough is designated the unorganized borough. To facilitate census taking in the unorganized borough, the U.S. Census Bureau, in cooperation with the state, divided the unorganized borough into 11 census areas. As shown in Table 5.5.5-1, three of those census areas are in the immediate region of influence. In the unorganized borough, the state legislature, as the governing body, has oversight of services that would otherwise be provided by the organized borough (e.g., education, planning and land use regulation, and property assessment and taxation) (Alaska Department of Commerce 2011b). Only three local jurisdictions in the pipeline corridor collect local taxes, primarily in the form of property taxes and sales taxes. These jurisdictions are the North Slope Borough, Fairbanks North Star Borough, and City of Fairbanks.

Table 5.5.5-2 presents the sources and levels of revenues collected in 2010 by borough governments in the immediate region of influence. In areas both inside and outside the pipeline corridor, a substantial percentage of local government revenues comes in the form of transfers from the state, primarily as direct state funding of local education programs, and from the federal government.

A large portion of this funding is derived from state oil revenues. Local taxes are also an important source of revenue for incorporated boroughs and communities in the immediate

region of influence. Revenues from oil and gas property taxes play an especially large role in generating tax revenues for some boroughs and communities. Among the areas inside the pipeline corridor, the North Slope Borough relies heavily on the oil and gas industry as a primary source of local revenues, mainly through the taxation of oil and gas properties. In contrast, the Fairbanks North Star Borough receives comparatively little of its revenues directly from oil and gas, even though property taxes constitute a large share of total revenues.

Local government expenditures in the immediate region of influence are shown in Table 5.5.5-3. The character of expenditures by the two boroughs in the pipeline corridor varies considerably. Over half of expenditures in the Fairbanks North Star Borough were on education, whereas in the North Slope Borough, expenditures on transportation and public works and general government were a larger component of total expenditures, with education making up only 12 percent of expenditures. This difference in local government focus reflects the fact that the North Slope Borough communities are typically isolated with air transportation being the primary mode of travel.

TABLE 5.5.5-1

Local Tax Revenue Sources in the Immediate Region of Influence

	Type of Area	Property Tax	Oil and Gas Property Tax	Sales Tax	Special Tax
INSIDE PIPELINE CORRIDOR					
North Slope Borough	Home-Rule Borough[2]	18.5 mills	yes	No	No
Yukon-Koyukuk Census Area	Census Area	n/a	n/a	n/a	n/a
Fairbanks North Star Borough	Second-Class Borough[1]	11.186 mills[4]	yes	No	8% Bed Tax; 8% Tobacco Tax; 5% Alcohol Tax
Southeast Fairbanks Census Area	Census Area	n/a	n/a	n/a	n/a
OUTSIDE PIPELINE CORRIDOR					
Denali Borough	Home-Rule Borough[2]	No	n/a	No	Severance Tax $.05/yard gravel-$.05 ton-coal; 7% Bed Tax
Municipality of Haines Borough	Home-Rule Borough[2]	11.26 mills	n/a	5.5%	4% Bed Tax
Kenai Peninsula Borough	Second-Class Borough[1]	4.5 mills	yes	3.0%	No
Matanuska-Susitna Borough	Second-Class Borough[1]	9.980 mills	yes	No	5% Bed Tax; 5.5% Tobacco Excise Tax
Municipality of Anchorage	Unified Home-Rule Municipality[2]	15.5 mills	yes	No	12% Bed Tax; 8% Car Rental Tax; Cigarette Tax
Municipality of Skagway Borough	First-Class Borough[1]	7.25 mills	n/a	5% from Apr. – Sept; 3% from Oct. - Mar.	8% Bed Tax
Valdez-Cordova Census Area	Census Area	n/a	n/a	n/a	n/a
Other – City of Unalaska	First-Class City[3]	10.5 mills	n/a	3.0%	2% Raw Fish Tax; 5% Bed Tax

n/a – not applicable

[1] First-class/second-class borough: A main difference between a first-class and second-class borough is the authority to assume powers. A first-class borough may exercise any power not prohibited by law on a non-area-wide basis (i.e., in the area of the borough outside cities) by adopting an ordinance. A second-class borough, however, must gain voter approval for the authority to exercise many non-area-wide powers.

[2] Home rule borough/city: A city or borough that has all the legislative powers not prohibited by law or charter. Typical area-wide powers include education, planning, animal control, fireworks control, health and environmental protection, library, mass transit, zoning, taxicab, rights-of-way use, parking, and sewers. Non-area-wide powers include building safety and police.

[3] First-class city: A first-class city has certain powers not available to second-class cities and likewise more obligations. For example, a first-class city has to the power to tax property without an authorizing vote of the public and is required to provide a system of public education.

[4] Mills is short hand for millage rate. It is the measure of a tax per $1,000 of assessed value.

Source: ADCCED (2011d); ADCCED (2011b).

TABLE 5.5.5-2

Local Government Revenues by Source in the Immediate Region of Influence

	Property Tax	Oil and Gas Property Tax	Other Taxes	Other Fees and Charges	Intergovernmental Transfers	Other General Fund Revenues	Non-General Fund Revenues	Enterprise/ Business Funds	Total
	$ Thousands (2010)								
INSIDE PIPELINE CORRIDOR									
North Slope Borough	4,852	270,803	0	6,110	19,113	20,285	57,084	26,531	404,778
Yukon-Koyukuk Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fairbanks North Star Borough	74,089	7,849	3,783	1,382	16,666	2,993	25,613	12,550	144,926
Southeast Fairbanks Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OUTSIDE PIPELINE CORRIDOR									
Denali Borough	0	0	2,488	0	877	61	507	474	4,407
Municipality of Haines Borough	1,897	0	1,162	613	1,657	622	8,116	768	14,836
Kenai Peninsula Borough	26,244	3,748	25,951	0	8,988	2,947	37,614	119,417	224,909
Matanuska-Susitna Borough	80,063	68	4,154	3,699	19,066	637	48,481	3,448	159,617
Municipality of Anchorage	471,347	3,558	39,190	45,043	28,167	9,306	133,784	308,522	1,038,917
Municipality of Skagway Borough	1,855	0	6,344	232	0	5,162	4,015	2,491	20,100
Valdez-Cordova Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other – City of Unalaska	4,249	0	9,459	298	12,742	2,856	3,054	20,809	53,467

Source: ADCCED (2011a).

TABLE 5.5.5-3

Local Government Operating Expenditures by Category in the Immediate Region of Influence

	Transportation and Public Works	Education	Public Welfare	Health (including utilities)	Public Safety	Environment and Housing	Government Administration	Debt Service	Other Expenditures	Total
	Thousands of $ (2010)									
Inside Project Corridor										
North Slope Borough	59,207	36,968	0	20,235	21,018	4,796	49,766	44,199	83,006	319,195
	19%	12%	0%	6%	7%	2%	16%	14%	26%	100%
Yukon-Koyukuk Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fairbanks North Star Borough	5,118	45,523	0	0	1,886	11,620	14,711	0	2,302	81,160
	6%	56%	0%	0%	2%	14%	18%	0%	3%	100%
Southeast Fairbanks Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Outside Project Corridor										
Denali Borough	0	1,762	0	0	0	0	1,004	0	31	2,797
	0%	63%	0%	0%	0%	0%	36%	0%	1%	100%
Municipality of Haines Borough	1,865	1,903	0	0	814	845	1,231	0	116	6,774
	28%	28%	0%	0%	12%	12%	18%	0%	2%	100%
Kenai Peninsula Borough	0	42,983	0	0	1,858	0	14,128	0	0	58,970
	0.0	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	1.0
Matanuska-Susitna Borough	3,892	43,965	0	0	6,411	3,187	18,481	0	0	75,935
	5%	58%	0%	0%	8%	4%	24%	0%	0%	100%
Municipality of Anchorage	38,367	233,854	0	13,194	178,693	34,338	17,718	36,720	44,241	597,124
	0.1	0.4	0.0	0.0	0.3	0.1	0.0	0.1	0.1	1.0
Municipality of Skagway Borough	1,178	641	0	13	1,853	1,009	2,369	170	97	7,331
	16%	9%	0%	0%	25%	14%	32%	2%	1%	100%
Valdez-Cordova Census Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other - City of Unalaska	5,203	3,736	688	0	4,308	2,139	4,013	1,108	0	21,195
	25%	18%	3%	0%	20%	10%	19%	5%	0%	100%

Source: ADCCED (2011a).

Another form of local government in Alaska is the tribal government, which exists in various forms throughout rural areas of the state. The Alaska Native tribal entities located in the immediate region of influence that are recognized by the U.S. Bureau of Indian Affairs are listed in Appendix 5A. The tribes generally fall into two types: tribal governments that were formed under the federal Indian Reorganization Act (IRA), and tribal governments that have traditional councils (Alaska Humanities Forum 2011).

5.5.5.2 Impacts and Mitigation

No Action Alternative

The revenues and expenditures under the No Action Alternative reflect the assumptions of OCS and other oil and gas development, and other resource extraction projects occurring into the future. The nominal dollars used in Table 5.5.5-4 reflect an assumption of 2.5 percent annual inflation over the 40-year forecast period. The State of Alaska currently experiences budget surpluses and the fiscal model projects those surpluses to end in 2040. Receipts from the federal government are assumed to remain near current per capita levels and increase with inflation.

Project

Development Phase

Direct revenues to the state and local governments from the Project during the development phase are anticipated to be minimal. Sales taxes might accrue to certain communities and boroughs and certain personal property might be subject to property taxes. State excise taxes and corporate income taxes might also increase, although the amounts are expected to be minor in comparison to present levels of tax receipts. These amounts are expected to be small and not discernible at the community level or at the state level.

Construction and Operations Phase

Construction and operation of APP would generate tax revenues for local governments and the State of Alaska. Some of these tax revenues would be associated with APP while other tax revenues would be generated by the production and sale of natural gas that is presently re-injected into the oil reservoirs on the North Slope. State tax revenues would begin to increase in 2015 due to the fact that property taxes would be paid while the Project is under construction. Moreover, additional revenues from excise and non-oil and gas corporate income taxes would be generated due to the higher level of economic activity associated with construction of the Project. It is anticipated that permission would be sought for additional exploration for oil and gas prior to the Project becoming operational as producers seek additional gas supplies that can now be economically transported by the APP. The associated liquids production would result in additional royalties and production taxes. Gas production is projected to generate royalties and production tax revenues beginning in late 2020.

Table 5.5.5-5 presents the estimated direct impact of the Project on state government revenues assuming the 2011 Alaska tax structure. In the first full year that gas moves down the pipeline the direct impact on state government revenues is estimated at $1.75 billion. Table 5.5.5-6 shows the combined direct and indirect effects of the Project on state oil and gas revenue streams and expenditures.

TABLE 5.5.5-4

State of Alaska Government Revenues and Expenditures – No Action Alternative

	2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
Oil and Gas Revenue Streams	5,846	6,089	6,306	6,356	6,506	6,930	7,281	8,179	7,652	7,738	8,828
Property Tax	154	160	168	172	176	181	187	228	259	309	369
Corporate Petroleum Income Tax	459	462	460	449	445	455	462	528	543	525	561
Royalties (incl. bonuses, rents, and interest)	1,711	1,757	1,785	1,773	1,779	1,838	1,904	2,255	2,077	2,059	2,411
Production Tax	3,513	3,701	3,883	3,953	4,098	4,448	4,721	5,161	4,768	4,840	5,481
Oil Conservation Surcharge	9	9	9	9	8	8	8	8	6	5	5
Non-Oil and Gas Revenues	631	658	683	689	707	755	795	889	832	843	960
Excise and Other Taxes	227	237	248	259	270	281	293	342	409	567	809
Non-Oil and Gas Business Tax	233	245	263	274	283	298	307	338	394	474	593
Less Contributions to Permanent Fund and Other	574	589	598	594	596	615	636	750	692	687	801
Receipts from Federal Government	3,712	3,885	4,058	4,237	4,420	4,604	4,795	5,593	6,693	9,279	13,235
Total State Revenues	**9,615**	**10,044**	**10,449**	**10,688**	**11,037**	**11,674**	**12,234**	**13,911**	**14,485**	**17,175**	**22,222**
State Unrestricted General Fund Expenditures											
Capital Budget	**721**	**774**	**794**	**740**	**759**	**768**	**787**	**297**	**336**	**430**	**550**
Operating Budget	**5,529**	**5,787**	**6,044**	**6,311**	**6,583**	**6,857**	**7,141**	**8,330**	**9,968**	**13,820**	**19,712**
Restricted Funds	**3,712**	**3,885**	**4,058**	**4,237**	**4,420**	**4,604**	**4,795**	**5,593**	**6,693**	**9,279**	**13,235**
Total State Expenditures	**9,962**	**10,447**	**10,897**	**11,289**	**11,762**	**12,230**	**12,723**	**14,220**	**16,996**	**23,530**	**23,530**

Source: Northern Economics (2011).

TABLE 5.5.5-5

Incremental Change in Projected State of Alaska Government Revenues and Expenditures – Direct Effects of Project

	Revenues and Expenditures (Millions of Nominal $)										
	Construction Phase							Operations Phase			
Categories	2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
APP Property Tax	31	77	154	221	255	270	273	281	289	296	284
APP Corporate Income Tax	0	0	0	0	0	23	232	232	257	236	436
APP ROW Lease	0	0	0	0	0	0	0	0	0	0	1
APP Subtotal	32	78	154	221	256	293	505	513	547	532	721
Gas Royalties	0	0	0	0	0	37	280	701	736	945	1,084
Gas Production Tax	0	0	0	0	0	3	328	1,172	1,211	1,685	2,187
Gas Corporate Income Tax	0	0	0	0	0	19	128	300	316	398	441
Gas Subtotal	0	0	0	0	0	60	737	2,172	2,263	3,028	3,711
Total	**63**	**155**	**308**	**442**	**511**	**646**	**1,747**	**3,198**	**3,356**	**4,092**	**5,153**

Source: Northern Economics (2011).

TABLE 5.5.5-6

Incremental Change in Projected State of Alaska Government Revenues and Expenditures – Direct and Indirect Effects of Project

	Revenues and Expenditures (Millions of Nominal $)										
	Construction Phase							Operations Phase			
Categories	2015	2016	2017	2018	2019	2020	2021	2025	2030	2040	2050
Oil and Gas Revenue Streams	32	78	154	223	261	98	376	2,988	5,702	6,653	7,528
Property Tax	31	77	154	223	261	283	294	298	312	317	305
Corporate Petroleum Income Tax	0	0	0	0	0	60	447	629	752	703	887
Royalties (incl. bonuses, rents, and interest)	0	0	0	0	0	37	339	971	1,499	1,547	1,622
Production Tax	0	0	0	0	0	-282	-705	1,088	3,134	4,083	4,711
Oil Conservation Surcharge	0	0	0	0	0	0	0	1	3	2	2
Non-Oil and Gas Revenues	6	12	21	29	34	13	34	322	626	738	840
Excise and Other Taxes	1	2	3	5	6	6	8	13	22	39	55
Non-Oil and Gas Business Tax	3	6	21	22	21	21	41	49	86	97	91
Less Contributions to Permanent Fund and Other	-20	-20	-20	-20	-20	-8	90	295	465	481	505
Receipts from Federal Government	16	28	53	77	93	102	125	212	362	636	887
Total Revenues	**73**	**137**	**248**	**350**	**407**	**221**	**446**	**3,227**	**6,224**	**7,546**	**8,750**
Percent Difference from No-Action Alternative	1%	1%	2%	3%	4%	2%	4%	23%	43%	44%	39%
State Unrestricted General Fund Expenditures											
Capital Budget	-99	-123	-142	-148	-166	-183	-202	-7	-8	-10	-13
Operating Budget	25	44	81	117	140	155	189	319	542	953	1,329
Restricted Funds	16	28	53	77	93	102	125	212	362	636	887
Total State Expenditures	**-58**	**-51**	**-8**	**47**	**67**	**74**	**113**	**523**	**896**	**1,578**	**12,171**
Percent Difference from No-Action Alternative	-1%	0%	0%	0%	1%	1%	1%	4%	5%	7%	52%

Source: Northern Economics (2011).

One revenue effect for certain communities in the pipeline corridor arising from the construction phase would be as a result of the bed tax generated by transportation and logistics workers supporting the actual construction activities. Spending by these same support workers would also generate local sales tax revenues for some municipalities in the immediate region of influence. However, these fiscal effects would be relatively minor because the construction workforce would reside in self-contained construction camps. To the limited extent that construction crews spend money in local hotels, restaurants, and shops, the fiscal effect of these expenditures would be concentrated in the Fairbanks and Anchorage areas where construction workers would be transported prior to returning to their homes or prior to being transported to the construction camps.

5.5.6 TRANSPORTATION

5.5.6.1 Existing Conditions

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 based on information provided in Resource Report 1. [Note: This section will be updated in the final report based on information presented in the Logistics Plan.]

Highways

There are substantial differences in traffic volumes across the 12 highways in Alaska that may experience transportation effects during the construction phase of the Project. As shown in Table 5.5.6-1, average annual daily traffic counts along a given highway can vary depending on location. For example, sections of the Glenn and Parks Highways in the Municipality of Anchorage and Matanuska-Susitna Borough experience more than 30,000 vehicles per day on average, while portions of the Alaska Highway, Elliott Highway, Dalton Highway, and Tok Cutoff experience traffic counts of less than 1,000 vehicles per day. In addition, traffic during the summer can be double the annual average; likewise, winter traffic can be half the annual average. All of the highways, with the exception of the Dalton Highway, are typically asphalt-paved two-lane roads. In population centers such as Anchorage and Fairbanks, highways more than two lanes exist.

TABLE 5.5.6-1

Summary
Average Annual Daily Traffic Count

	Parks Hwy	Glenn Hwy	Seward Hwy	Dalton Hwy	Elliott Hwy	Richardson Hwy	Tok Cutoff	Haines Hwy	Haines Cutoff	South Klondike Hwy	Alaska Hwy	Steese Hwy
	Thousands (2009)											
INSIDE PIPELINE CORRIDOR												
North Slope Borough	-	-	-	-	-	-	-	-	-	-	-	-
Yukon-Koyukuk Census Area	1.6	-	-	0.2	.45	-	-	-	-	-	-	-
Fairbanks North Star Borough	5.8-15.2	-	-	-	0.0-1.2	0.0-10.8	-	-	-	-	-	3.8-25.8
Southeast Fairbanks Census Area	-	-	-	-	-	1.3-4.3	0.3-1.5	-	-	-	0.2-0.6	-
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	1.2 - 2.9	-	-	-	-	-	-	-	-	-	-	-
Municipality of Haines Borough	-	-	-	-	-	-	-	0.5-3.0	-	-	-	-
Kenai Peninsula Borough	-	-	1.6-7.3	-	-	-	-	-	-	-	-	-
Matanuska-Susitna Borough	1.5-35.5	1.5-16.3	-	-	-	-	-	-	-	-	-	-
Municipality of Anchorage	-	-	-	-	-	-	-	-	-	-	-	-
Municipality of Skagway Borough	-	-	-	-	-	-	-	-	-	1.872	-	-
Valdez-Cordova Census Area	-	2.5	5.7	-	-	0.4-4.5	0.4-0.6	-	-	-	-	-
Other – City of Unalaska	-	-	-	-	-	-	-	-	-	-	-	-

Source: Alaska Department of Transportation and Public Facilities (ADOTPF) (2011a)
Notes: - Indicates no traffic volume data

Railroads

Alaska's two rail systems include the Alaska Railroad and the White Pass and Yukon Railway. The Alaska Railroad Corporation (ARRC), a public corporation, 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 ARRC at the ports of Anchorage, Seward, and Whittier for handling freight reaching Alaska by barge. The Alaska Rail Marine, managed by ARRC, operates rail-equipped barges year-round that transport freight between Seattle and Whittier. Waterborne rail cars also connect with the Canadian National Aquatrain, which provides freight transport to Alaska from Prince Rupert, British Columbia.

From 2008 to 2010, ARRC generated 73 percent of its revenues from freight hauling, 18 percent from passenger service, and 8 percent from real estate operations (ARRC 2011). 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.

The White Pass and Yukon Railway extends from Skagway to Carcross in Canada's Yukon. Initially, the 110 miles of track provided access for supplies inbound to Yukon mines, and transport for outbound ore. The railway suspended operations in 1982 due to low mineral prices, but started tourist operations along the first 67.5 miles in 1988. The White Pass and Yukon Railway carried approximately 365,000 passengers in 2010, during the May to September tourist season. The railroad does not currently carry cargo beyond recreational equipment brought onboard by its passengers (White Pass and Yukon Railway 2011).

Ports and Harbors

Nine Alaska ports were identified as being potentially affected by Project-related transportation needs. The ports of Anchorage, Seward, and Whittier have rail and highway connectivity and are being considered as ports-of-entry for materials and equipment used in constructing APP. Port MacKenzie has highway access and plans for a rail spur to connect to the ARRC mainline near Willow. The Port of Valdez offers highway access to the Interior, and the Port of Haines also provides access to the Interior and the Yukon. No APP-specific upgrades are necessary at these ports, but other upgrades might be required for existing plans. The general characteristics of each of these ports are described below. Skagway and the Port of Dutch Harbor offer potential for construction of APP.

Port of Anchorage

The Port of Anchorage is a regional port and key transportation asset located in Southcentral Alaska, with direct connections to AIA, the Alaska highway system, and the Alaska Railroad. Deemed "Alaska's Lifeline," the port serves as the entry point for waterborne commerce to approximately 80 percent of Alaska's population (VZM/TranSystems–Tryck-Nyman-Hayes 1999). In addition to supplying Alaska residents and businesses with cargo, the port serves as a strategic hub for the military, providing all the necessary jet fuel to Joint Base Elmendorf-Richardson. In 2010, the port moved 3.96 million tons of commodities through the facility, with

petroleum products (largely bound for AIA) accounting for 53 percent of that amount, container shipments for 44 percent, and dry goods for 3 percent (Port of Anchorage 2011). Container cargo ships arrive two times weekly throughout the year (Sundays and Tuesdays) with an additional ship arriving on Saturdays in the summer only. 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 rail tankers generally originating from oil refineries near Fairbanks (VZM/TranSystems–Tryck-Nyman-Hayes 1999), and imported fuels, primarily jet fuel, for carriers operating at AIA. ARRC operates a Trailer-On-Flat-Car facility used to load and unload container vans for shipment to Fairbanks and other destinations (Municipality of Anchorage Traffic Department 2001). A 129-acre industrial park adjoins the port to the east. Approximately 81 acres of the park are under long-term lease to various port users. Additionally, there are 31 acres for staging and storing marine cargo in transit; however, a majority of that acreage is presently occupied by two major carriers which originate in Tacoma – Totem Ocean Trailer Express and Horizon Lines.

The port is undergoing an intermodal expansion project that will expand the total dockage to 6,000 feet. This project will also increase the upland storage area to 56 acres. Larger container cranes will also be installed at the dock. The dock expansion will accommodate up to 1,000-foot ships as well as those requiring greater water-depth, and improve and expand cruise ship, container ship, bulk material, and petroleum handling. A road and rail extension will improve cargo flow and substantially reduce traffic conflicts outside of port boundaries (Municipality of Anchorage undated).

Port of Seward

The Port of Seward is 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 (VZM/TranSystems–Tryck-Nyman-Hayes 1999). The Port of Seward is served by ARRC. The North Dock, which could be used for incoming freight, is utilized only 20 to 30 days out of the year (Anderson 2011), but according to the Port of Seward the dock is in poor shape with a fendering system in need of repair to prevent damage from loading operations (Seward Harbormaster and Community Development Department 2008).

Port of Valdez

The Port of Valdez is a regional port in Prince William Sound and the northernmost ice-free port in the United States. The port serves as the southern terminus of TAPS and accounts for the largest amount of tonnage moved at a single Alaska port, currently averaging 550,000 barrels of crude oil per day (PWSRCAC Statistics, 2011). Port facilities include the General Cargo and Container Wharf, which is owned by the City of Valdez and operated by the City of Valdez 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. Additionally, a 21-acre marshalling yard used during the construction of TAPS is located near the dock. The container terminal is occupied two or three days a month during the winter and weekly during the summer once fishing season starts (Kinney 2011).

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 ARRC. The freight dock currently serves roll-on/roll-off style barges and has a side ramp for container offloading from barges. The port represents ARRC's only viable freight interchange point for its barge service connecting Alaska with the contiguous United States and Canada (Seward and Anchorage are not viable port alternatives for barge interline service; Anchorage is not free of ice year-round and Seward requires traveling over a mountain pass at a 3 percent grade) (ADOTPF undated). Barge traffic in and out of Whittier consists of a weekly 420-foot ARRC/Alaska Railroad Marine Services barge operated by Lynden Transport and a barge operated by Canadian National Aquatrain that calls in Whittier once every 11 to 12 days (Whittier Coastal District 2006). A passenger ship terminal is used by cruise lines offering glacier-route cruises. A rail spur accommodates transportation of cruise ship passengers arriving at and departing from the port. In addition, the cruise ship companies use buses to transport passengers between Anchorage and Whittier (Campbell 2004).

Port of Skagway

The Port of Skagway is a sub-regional port located in Southeast Alaska and has traditionally been a main supporting port for the Yukon. It also maintains highway links for deliveries to the Interior, though the distance to the Interior from Haines is much less than through Skagway. During the summer months, Skagway is a popular port-of-call for cruise ships. The port can house up to five cruise ships at any given time, temporarily increasing the population with 10,000 – 13,000 visitors (City of Skagway, 2011). The port is currently developing plans to improve its facilities due to increased mining activities in the Yukon (Skagway Port Commission 2011). The Railroad Dock-North is an 800-foot-long freight dock designed for heavy freight transfers to rail or truck.

Port of Haines

The Port of Haines is a sub-regional port located in Southeast Alaska near the U.S-Canadian border with British Columbia. The port has direct connections to the Alaska Highway system for transporting goods to the Interior and the Yukon. The port serves as a major supply hub for Southeast Alaska residents and a transportation hub for tourists. Petroleum products are delivered to the port via tug and barge, and the port exports a large amount of seafood. Two primary tug and barge companies currently serve the port as part of a regular distribution line, but smaller companies also use the port as an intermediate destination for wood products and other goods along transshipment lanes (City of Haines 2004).

Port MacKenzie

Port MacKenzie is a sub-regional port located on Cook Inlet. The port currently contains a 1,200-foot deep-draft dock and 500-foot barge dock. Additionally, new infrastructure is currently being built to handle larger transport of bulk commodities. Utilization of the deep-draft dock is currently low, with ships occupying the space 3-10 days out of the year; however, increased

traffic to the deep-draft dock is expected after expansion of the dock is completed in 2013 (VanDongen 2011).

Port of Dutch Harbor

The Unalaska Marine Center (UMC) is a regional container facility located at the Port of Dutch Harbor in Southwestern Alaska. UMC has approximately 2,051 linear feet of dock space, and Horizon Lines operates a 30-ton crane (City of Unalaska 2011). The Light Cargo Dock serves as an alternative off-loading site. Excess capacity at the UMC has increased in recent years due to the opening of a new private dock by DH Ports, LLC (Osterbeck 2008). American President Lines operates a second, private, container dock in the Port of Dutch Harbor for shipping product to Asian markets. A number of other private docks are located in the community and provide services for vessels operating in the region.

Prudhoe Bay West Dock

The Prudhoe Bay West Dock is not a traditional port, but a gravel causeway used to off-load materials moving to Prudhoe Bay via barge. A 45 foot wide haul road currently exists to move equipment off the causeway and transported to specific facilities. As referenced in Resource Report 1, the West Dock will be a primary entry-point for equipment and materials used to construct the GTP. APP will expand the existing dock to the east using sheetpile construction with import fill. The modifications will add five new berths to offload barges within the estimated 45-day-long open-water work window. In addition, the causeway road from Dock Head 2 to the existing staging area would also need to be widened to address operational and safety issues.

Since the current staging unit at the West Dock is heavily used and does provide adequate space to house the equipment for the GTP, APP will construct a staging area for the GTP modules and for storage of mainline pipe, equipment and supplies.

Airports

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. Table 5.5.6-2 shows a list of 23 Alaska airports and airstrips potentially affected by Project-related transportation needs. 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.

As shown in Table 5.5.6-2, the airports vary widely in runway characteristics and capacity. The airports in Anchorage, Fairbanks, and Juneau are international airports with long asphalt runways and a large number of annual flight operations per year. The three airports provide multiple types of operations, but the primary type of operation at each airport is different. Deadhorse Airport was developed in the 1970s to support oil and gas development and is now the main transportation hub on the North Slope.

TABLE 5.5.6-2

Summary
General Characteristics of Airports

Airport	Runway Surface	Maximum Runway Length (ft)	Average Annual Number of Operations	Primary Operation Type (percent of total flights)[1]	Volume of Segment Commercial Air Traffic[2]	
					Number of Passengers (2010)	Pounds of Cargo[3] (2010)
INSIDE PIPELINE CORRIDOR						
North Slope Borough						
Badami	Gravel	5,000	-	Private runway (BP)	-	-
Deadhorse Airfield	Asphalt	6,500	19,710	Transient (31%)	91,889	33,677,385
Franklin Bluffs Airstrip	-	-	-	-	-	-
Happy Valley Airstrip	-	-	-	-	-	-
Galbraith Lake Airport	Gravel	5,182	360	Air taxi (48%)	1,793	3,463
Yukon-Koyukuk Census Area						
Chandalar Airfield	Gravel	3,000	300	Transient, local, air taxi (each 33%)	88	15,300
Dietrich Airport	-	-	-	-	-	-
Coldfoot Airfield	Gravel	4,000	996	Air taxi (80%)	1,642	90,827
Old Man Camp Airfield	-	-	-	-	-	-
Five Mile Airport	Gravel	2,700	200	Transient (100%)	-	-
Livengood Airfield	Gravel	1,415	100	Air taxi (100%)	-	-
Fairbanks North Star Borough						
Fairbanks International Airport	Asphalt	11,800	133,225	Local (35%)	964,254	60,703,391
Southeast Fairbanks Census Area						
Delta Junction Airfield	Gravel	2,500	-	-	-	-
Tanacross Airfield	Asphalt	5,100	804	Transient (100%)	144	1,650
Tok Airport	Asphalt	2,509	2,704	Air taxi (56%)	-	-
Tetlin Airfield	Gravel	3,300	-	-	-	-
Northway Airport	Asphalt	5,100	15,695	Transient (51%)	114	2,478
OUTSIDE PIPELINE CORRIDOR						
Municipality of Haines Borough						
Haines Airport	Asphalt	4,000	5,668	Air taxi (79%)	21,592	1,368,287
Kenai Peninsula Borough						
Seward Airport	Asphalt	4,240	10,585	Air taxi (43%)	9	0
Municipality of Anchorage						
Ted Stevens Anchorage International Airport (AIA)	Asphalt	11,584	289,445	Commercial (37%)	4,648,949	10,139,605,654
Merrill Field	Asphalt	4,000	191,550	Local (52%)	-	-
Municipality of Skagway Borough						
Skagway Airport	Asphalt	3,550	12,410	Air taxi (86%)	15,986	861,555
Valdez-Cordova Census Area						
Valdez Airport	Asphalt	6,500	9,125	Air taxi (41%)	31,064	150,925

TABLE 5.5.6-2

Summary
General Characteristics of Airports

Airport	Runway Surface	Maximum Runway Length (ft)	Average Annual Number of Operations	Primary Operation Type (percent of total flights)[1]	Volume of Segment Commercial Air Traffic[2]	
					Number of Passengers (2010)	Pounds of Cargo[3] (2010)
Whittier Airport	Gravel	1,480	768	Local (91%)	-	-
Other – City and Borough of Juneau						
Juneau Airport	Asphalt	8,457	86,505	Air taxi (73%)	714,789	40,237,984

[a] Transient – operators, excluding air carriers, operating on other than local flights.
Air taxis – operators carrying passengers, mail or cargo for revenue.
Local – operations occurring in the local traffic pattern or within a 20-mile radius of the airport.
Commercial – scheduled operations by s by Civil Aeronautics Board-certificated carriers or intrastate carriers.

[b] Segment data represent all passengers and cargo that enplaned/deplaned at the airport including those that traveled through the airport but did not enter or exit the aircraft while making a stop at the airport. This differs from "market" data, which include only passengers and cargo that enter or exit the aircraft at a given airport. The difference between segment and market traffic is small except for Coldfoot Airfield (70 percent of the total traffic is flow-through passenger and cargo traffic), Anchorage Airport (67 percent), Fairbanks Airport (51 percent), and Juneau Airport (42 percent).

[c] Includes freight and mail.

Source: AirNav (2011).

The commercial air traffic volumes and primary air carriers in 2010 are also shown in Table 5.5.6-2. Air traffic is measured by the number of passenger and pounds of cargo (mail and freight) flown to/from/through the airport by any domestic or international air carrier (U.S. Department of Transportation 2011). Very small carriers such as air taxis are not included in these statistics and explain why some airports show operations, but no data for passengers or cargo. AIA is by far the state's largest hub for passenger and cargo air traffic. Over 4.6 million passengers and 10 billion pounds of cargo traveled through AIA in 2010. In 2010, the airlines carrying the most passengers are Alaska Airlines (58 percent), Delta Airlines (10 percent), and Era Aviation (8 percent), while the airlines carrying the most cargo are Korean Airlines (14 percent), United Parcel Service (12 percent), Cathay Pacific (11 percent), Federal Express (11 percent), Eva Airways (11 percent), and China Airlines (10 percent) (U.S. Department of Transportation 2011). Most of the other Alaska airports have considerably less commercial air traffic and are served primarily by Everts, Era, Frontier, Hageland, Grant, and Wright.

5.5.6.2 Impacts and Mitigation

No Action Alternative

Highways

Future highway usage in Alaska would largely be driven by population growth and economic activity. The projected slower growth in tourism would decrease usage, but planned projects such as the road to Umiat, expansion of the Port of Anchorage and Skagway, Point Mackenzie rail spur, and Watana Dam would result in localized increases in vehicle traffic and associated increases in maintenance on the highways.

Increased maintenance of bridges is expected to occur in conjunction with highway usage. According to the 2010 Alaska Bridge Report published by The Alaska Department of Transportation and Public Facilities (ADOTPF), the state's bridge infrastructure is generally in good condition, with only one-third of bridges past the midpoint in the design lifecycle. However, funding sources from the Federal Highway Administration (FHWA) are no longer sufficient to cover the entire cost of preservation and replacement required to maintain all of the state's bridges. Given the limited federal funding to cover expanding infrastructure costs, it is likely that ADOTPF will prioritize funding based upon structural deficiencies and projected traffic.

Ports and Harbors

The planned transportation projects described in Appendix 5D include the following improvements to Alaska's ports and harbors:

- Expansion projects at the Port of Skagway and Port of Anchorage would be completed in 2016 and 2020, respectively;
- Port of Seward improvements would be completed to support coal exports and increasing utilization by fishing vessels;
- The Port MacKenzie rail spur would be completed by 2025;
- A port would be built in Iniskin Bay to support development of the Pebble Mine in 2025; and
- Dock facilities at Prudhoe Bay would be developed with substantial dredging to support OCS development, and a port on the Chukchi Sea coastline would be built in 2026 to support further OCS as well as National Petroleum Reserve-Alaska development.

Usage at these facilities would be supported by ongoing economic activities or by activity at the particular project the facility was designed to support.

Airports

No major changes in air traffic are expected at potentially affected airports under the No Action Alternative. In general, air cargo and passenger traffic would grow in line with global economic activity and changes in Alaska's population and tourism activity. The Bypass Mail Program and the Essential Air Service Program are expected to continue. The Bypass Mail Program is a service of the U.S. Postal Service that moves parcel post mail to communities in rural Alaska by air service, while the Essential Air Service is a federal program which subsidizes service to rural communities which otherwise would not have enough passenger volume to justify flight service. In Alaska, the vast majority of communities served by the program are not reachable from the road system.

Alaska Railroad Corporation

No major changes in railway usage are expected under the No Action Alternative. The ARRC would continue to move fuel from the Flint Hills refinery in Fairbanks to markets in Anchorage, but at a lower volume due to the expected decline in North Slope oil production. The ARRC would also continue to move coal from Healy to Seward where port improvements would support growth in coal handling.

Project

Development Phase

The Development Phase is not anticipated to have a discernable effect on transportation modes in Alaska.

Construction Phase

It is anticipated that mobilization of construction equipment and materials would begin in 2015, with Alaska Mainline construction beginning in 2016. The Project would ship the majority of equipment using oceangoing ships and barges to Alaska through ports in the Gulf of Alaska. Once the material and equipment arrives in Alaska, it would be transported by rail and truck to the specific predetermined storage areas. In addition, the Project would house early delivery of construction materials and mechanical equipment at a storage area near Fort Wainwright that would function as a centralized stockpile prior to the beginning of construction. Equipment arriving later in the mobilization process would be moved to specific intermediate stockpiles or pipe storage areas along the Alaska Mainline and PT Pipeline routes. Early delivery of construction equipment and materials would ease congestion during the construction phase but would still result in use of Alaska's highways.

Project construction would require substantial use of transportation infrastructure in Alaska. Though construction would result in increased usage of highways, ports and railroads, airports and rail would likely be the most affected in terms of increased traffic and wear.

Highways

During the construction phase highways and access roads would be used to transport equipment, material, pipe, and personnel to the right-of-way, compressor stations, borrow sites, GTP site, and other locations. No road improvements are expected to be required for major public roads that would be used during Project construction. Some existing non-public roads (e.g., in the Prudhoe Bay Unit or old TAPS access roads that may not be actively used) may need to be modified to accommodate large and heavy construction equipment and material.

Project construction would result in substantial truck and vehicle movements on certain highways and roads in the state, resulting in increased maintenance and repair costs for the state and local governments. [Note: A Summary of ADOTPF's road-wear analysis for APP will be added if available for the final report.]

In lieu of ADOTPF's road-wear analysis, estimates of current ESALs on the affected highways were compared to potential ESALs derived from logistics data available from Resource Report 1. Federal Highway Administration Vehicle Classifications, estimates of traffic composition, and Average Annual Daily Traffic located in ADOTPF Annual Traffic Volume Reports were used to estimate average annual ESALs at specific mileposts along the affected highways (ADOTPF 2009).

TABLE 5.5.6-3

Range of Equivalent Single-Axle Loads Experienced by Highway and Borough Census Area (Thousands)

	Parks Hwy	Glenn Hwy	Seward Hwy	Dalton Hwy	Elliott Hwy	Richardson Hwy	Tok Cutoff	Haines Hwy	Haines Cutoff	South Klondike Hwy	Alaska Hwy	Steese Hwy[a]
INSIDE PIPELINE CORRIDOR												
North Slope Borough	—	—	—	—	—	—	—	—	—	—	—	—
Yukon-Koyukuk Census Area	75.7	—	—	38.4-40.4	22.6	—	—	—	—	—	—	—
Fairbanks North Star Borough	216.6-309.5	—	—	—	58.2	242.3	—	—	—	—	—	104.4-717.5
Southeast Fairbanks Census Area	—	—	—	—	—	64.9-285.2	21.1-87.0	—	—	—	14.2-53.8	—
OUTSIDE PIPELINE CORRIDOR												
Denali Borough	56.7-150.4	—	—	—	—	—	—	—	—	—	—	—
Municipality of Haines Borough	—	—	—	—	—	—	—	18.8-114.9	—	—	—	—
Kenai Peninsula Borough	—	—	67.6-315.6	—	—	—	—	—	—	—	—	—
Matanuska-Susitna Borough	90.6-678.0	75.8-355.6	—	—	—	—	—	—	—	—	—	—
Municipality of Anchorage	—	630.1-720.2	358.1	—	—	—	—	—	—	—	—	—
Municipality of Skagway Borough	—	—	—	—	—	—	—	—	—	127.4	—	—
Valdez-Cordova Census Area	—	156.8	240.1	—	—	27.3-194.2	24.6-31.0	—	—	—	—	—
Other – City of Unalaska	—	—	—	—	—	—	—	—	—	—	—	—

[a] The measurement points for the Steese Highway are located near Fairbanks and there is no permanent traffic recording station near the highway's northern terminus. Thus, the exhibited range likely overstates actual ESALs experienced by the highway at more northern points such as Circle.

— indicates no traffic volume data.

Source: Northern Economics (2011).

Data from the 2009 ADOTPF Annual Traffic Volume Reports for the Northern, Central, and Southeastern Region were used to estimate average traffic flow and vehicle composition. For each highway within a region, specific routes and major junctions likely to be logistical points for pipeline construction were selected. To ensure that the ranges provided the best baseline practicable, mile points were selected along routes that passed near communities in the immediate region of influence. Table 5.6.6-3 illustrates the range of ESALs at specific points along affected highways. The higher the number shown in the table, the more wear and tear the highway experiences on an annual basis. ESALs tend to be lower at points away from larger communities and much higher near population centers and major intersections. This relationship exists because ESALs are directly related to traffic volume and composition. Higher traffic volume and a higher portion of trucks results in greater road-wear.

Based on current plans, it is estimated that approximately 2.1 million ESALs would be applied to Alaska highways over a four-year period as a result of the Project. The fleet of support vehicles required would add an additional 250,000 ESALs during the construction phase.

Estimated incremental Project-related highway use projections are summarized in Table 5.5.6-3. For example, the Dalton Highway is the only highway that provides direct access to Prudhoe Bay. As shown in Table 5.5.6-3, the high end of the ESAL range for the Dalton Highway was around 40,400 ESALs a year near Coldfoot in 2009. Assuming ESALs along the Dalton Highway remain constant, this would be equivalent to approximately 161,600 ESALs over a four-year period. If one-tenth of the expected estimated Project-related ESALs occur on the Dalton Highway, the highway load would double. Even if repairs were not necessary during or immediately after APP construction, the additional Project-related mileage would reduce the time between major road and highway refurbishments.

Increased wear of bridges is expected to occur in conjunction with highway usage. According to the ADOTPF (2011b), the state's bridge infrastructure is generally in good condition, with only one-third of bridges past the midpoint in the design lifecycle. However, funding sources from the Federal Highway Administration are no longer sufficient to cover the entire cost of preservation and replacement required to maintain all of Alaska's bridges. Given the limited federal funding to cover expanding infrastructure costs, it is likely that ADOTPF will prioritize funding based upon structural deficiencies and projected traffic.

Ports and Harbors

The majority of equipment and materials used in Project construction would be shipped to Alaska using oceangoing ships and barges. Ports accessible through the Gulf of Alaska will be the likely points of entry for offloading equipment. Additionally, improved docking facilities in Prudhoe Bay would be used to receive modules, equipment, and material during the open-water transit window. Contractors would then transport the offloaded pipe segments and other materials to predetermined storage areas by rail or truck. Contractors would move GTP modules via self-propelled modular transporters to the GTP laydown area and to the GTP site.

[Note: A summary of marine transportation analysis will be included in the final report.]

Airports

Existing airstrips would be used to transport personnel and freight to and from the Project area. Existing commercial airports are not anticipated to require upgrading for the Project, but minor upgrades may need to make to some existing non-commercial airstrips. Temporary upgrades

may include installation of buildings, fuel storage, secondary containment structures, powered traffic controls, and miscellaneous other materials mobilized for the Project.

It is expected that many Project workers would be transported by commercial or charter flights from cities in the contiguous United States to Anchorage or Fairbanks. The field crews, including Alaska resident workers, would then be transported by air or ground to the various construction camps. Based on the number of round-trip tickets required (53,700), it is estimated that 419 plane-loads would be required to move workers to and from their designated locations. However, some of the construction camps are not located in proximity to jet-capable airstrips, and smaller planes with less capacity may be needed to transport construction crews. Consequently, a greater number of flights would be required. In addition, the mobilization and demobilization of construction crews would occur over a period of at least several weeks as the necessary skills and occupations are scheduled and required. Smaller aircraft and more flights can better address this requirement than larger aircraft. In comparison to the current capacity of the Anchorage and Fairbanks airports, the number of Project-related commercial flights would be small. For example, the average operating capacity of the Fairbanks airport was 133,225 flights in 2011. Moreover, since commercial flights generally follow well-established flight patterns, it is unlikely the movement of Project workers would place undue logistical stress on the major airports in Alaska.

Alaska Railroad Corporation

The Alaska Railroad would be used to move pipe and construction equipment from ports in the Gulf of Alaska to predetermined storage areas in the greater Fairbanks area. Where practicable, rail lines would also be used to transport equipment to additional points to Project construction areas; however, it is likely that most equipment would then be transported to worksites via truck.

[Note: A summary of rail transportation analysis for APP will be included in the final report.]

Operations Phase

APP usage of transportation infrastructure in Alaska during the operations phase would be limited and would likely involve ongoing maintenance of Pipeline Facilities[9] and Aboveground Facilities[10] along the pipeline corridor. The majority of traffic related to Project maintenance would likely be seasonal, with increased usage in the summer. Most of the traffic would likely originate from the Fairbanks area, where APP operations would be managed; however, contractors may fly in from outside Alaska to perform technical maintenance and upgrades.

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9 The Pipeline Facilities will consist of the PT Pipeline and the Alaska Mainline, as discussed in Section 1.3.1 of Resource Report 1.

10 Aboveground Facilities include the GTP, eight compressor stations, three custody meter stations, various mainline block valves (MLBV), pig launchers, pig receivers, provisions for intermediate gas delivery points, and cathodic protection facilities as discussed in Section 1.3.2 of Resource Report 1.

5.5.7 ENVIRONMENTAL JUSTICE

5.5.7.1 Existing Conditions

Executive Order 12898 on Environmental Justice requires that each federal agency address disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority and low-income populations. The population groups to be considered in an analysis of environmental justice were defined by the Interagency Working Group on Environmental Justice, which was established by Executive Order 12898 to implement the order's requirements. A minority is any individual classified as American Indian, Alaska Native, Asian, Pacific Islander, African American, or Hispanic. Low-income populations are defined as those living below the established poverty level. Descriptions of the demographic and economic characteristics of each community in the immediate region of influence are provided in Appendix 5A. Descriptions of the local infrastructure and public services in each community in the immediate region of influence are provided in Section 5.5.4.

Figure 5.2-1 depicts Boroughs, Census Areas, and Cities in relation to the Project.

Table 5.5.7-1 describes the ethnic and racial composition of the boroughs and census areas within the immediate region of influence in 2010. The Yukon-Koyukuk Census Area and North Slope Borough had the highest aggregate minority populations due to a large number of predominantly Alaska Native communities in those areas. The areas with the lowest minority populations were the Kenai Peninsula Borough and the Municipality of Skagway Borough.

The minority population percentage varies widely across the communities inside and outside the pipeline corridor. The two largest communities, Fairbanks and Anchorage, both have sizeable minority populations – 37.5 percent and 36.8 percent, respectively. These percentages are close to the state average of 35.4 percent.

Table 5.5.7-2 shows the average percent of people who were in poverty from 2005 through 2009 in the boroughs and census areas within the immediate region of influence. The Yukon-Koyukuk Census Area, North Slope Borough and Southeast Fairbanks Census Area had a higher percentage of people living below the poverty line than the state average. Boroughs and census areas with a higher Alaska Native population than the state as a whole (e.g., Yukon-Koyukuk Census Area, North Slope Borough) also had a higher percentage of people living in poverty. Communities inside and outside the pipeline corridor with a higher Alaska Native population than the state as a whole also tended to have a higher percentage of people living in poverty, but there were several exceptions.

TABLE 5.5.7-1

Racial and Ethnic Composition in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Percent White[1]	Percent Black or African American[2]	Percent Alaska Native and American Indian[2]	Percent Native Hawaiian and Other Pacific Islander[2]	Percent Asian[2]	Percent Some Other Race[2]	Percent Hispanic or Latino[3]	Percent Minority[4]
STATE OF ALASKA	66.7	4.7	19.5	1.6	7.1	2.1	5.5	35.4
INSIDE PIPELINE CORRIDOR								
North Slope Borough	33.4	1.8	58.5	1.6	5.5	0.9	2.6	67.4
Yukon-Koyukuk Census Area	22.2	0.5	76.4	0.1	0.8	0.2	1.2	78.1
Fairbanks North Star Borough	77.0	6.1	10.9	0.8	4.3	2.1	5.8	25.4
Southeast Fairbanks Census Area	80.4	1.5	15.0	0.4	1.6	1.4	3.3	20.8
OUTSIDE PIPELINE CORRIDOR								
Denali Borough	89.6	0.6	6.4	0.1	2.2	1.2	2.3	10.9
Municipality of Haines Borough	83.2	0.7	14.0	0.1	1.7	1.0	1.9	17.1
Kenai Peninsula Borough	94.2	1.1	12.9	0.6	2.3	1.0	3.3	7.4
Matanuska-Susitna Borough	84.9	1.8	10.1	0.6	2.4	1.2	3.7	16.8
Municipality of Anchorage	66.0	7.7	12.4	2.8	10.3	3.1	7.6	36.8
Municipality of Skagway Borough	91.4	0.2	5.4	0.2	2.3	0.9	2.2	9.7
Valdez-Cordova Census Area	74.0	0.9	19.4	0.8	4.7	1.1	3.6	27.5
Other – City of Unalaska	39.2	7.5	8.1	3.1	35.5	8.9	15.2	65.6

[1] Alone

[2] Alone or in combination with one or more other races

[3] Of any race

[4] Minority = Total – (White Alone + Some Other Race Alone + Two or More Races, White and Some Other Race) + (Hispanic, White Alone + Hispanic, Some Other Race Alone)

Source: U.S. Census Bureau, 2010 Census (2011)

TABLE 5.5.7-2

Poverty Rate in Boroughs and Census Areas Inside the Immediate Region of Influence and State of Alaska

	Average Percent of Individuals Living in Poverty (2005-2009)
STATE OF ALASKA	9.6
INSIDE PIPELINE CORRIDOR	
North Slope Borough	14.8
Yukon-Koyukuk Census Area	24.1
Fairbanks North Star Borough	8.0
Southeast Fairbanks Census Area	11.6
OUTSIDE PIPELINE CORRIDOR	
Denali Borough	6.1
Municipality of Haines Borough	4.6
Kenai Peninsula Borough	9.7
Matanuska-Susitna Borough	10.3
Municipality of Anchorage	7.8
Municipality of Skagway Borough	9.3
Valdez-Cordova Census Area	8.1
Other – City of Unalaska	11.0

Source: U.S. Census Bureau 2005-2009 American Community Survey (2011).

5.5.7.2 Impacts and Mitigation

[Note: Impacts and Mitigations will be discussed further in the final report.]

5.5.8 SUBSISTENCE

Available subsistence resource harvest information is provided the Draft Subsistence Report (Appendix 5E). This report identifies the subsistence use areas by community and provides harvest data by resource. Potential project-related impacts from construction, operations, and maintenance activities will be evaluated and presented in the October 2012 final report. At that time, this report will include the concerns raised by subsistence users in APP's 2010 and 2012 community meetings. Additionally, the ADFG Subsistence Division continues to conduct surveys in select communities along the pipeline route which will be provided to FERC for use in developing the project's Environmental Impact Statement.

5.5.9 HEALTH IMPACT ASSESSMENT

A Health Impact Assessment is being conducted for the project by ADHHS, Division of Public Health, Section of Epidemiology and their contractor NewFields. The Health Impact Assessment will be submitted directly to the FERC by the Alaska Department of Health and Social Services concurrent with the October 2012 FERC Application and Resource Reports.

5.6 ANALYSIS OF CUMULATIVE IMPACTS

A cumulative impact is the impact on the environment that results from the incremental impact of the proposed action when added to other past, present, and RFFAs regardless of what

agency (federal or non-federal) or person undertakes such other actions (40 C.F.R. § 1508.7). A description of the current aggregate effects of past actions are included in the description of existing conditions. The RFFAs associated with the Project are described in Appendix 5D.

[Note: Field surveys and agency consultation are ongoing. Cumulative impacts will be updated in the final report.]

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