Assessment of the Proposed Force Reduction of the 4-25th Airborne Brigade Combat Team

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The Municipality of Anchorage

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Northern Economics
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Abbreviations

ABCT	Airborne Brigade Combat Team
ACS	American Community Survey
ADF&G	Alaska Department of Fish and Game
ADOLWD	Alaska Department of Labor and workforce development
ADM	Average daily membership
ASD	Anchorage School District
ASL	Assigned Strength Level
ATF	Airborne Task Force
BEAR Working Group	Base Economic Analysis Review Working Group
CDP	Census Designated Place
CSSB	Combat Sustainment Support Battalion
DOD	Department of Defense
DODEA	Department of Defense Education Activity Grant
ESRI	Environmental Systems Research Institute
GIS	Geographic Information System
JBER	Joint Base Elmendorf Richardson
ML&P	Municipal Light and Power
MOA	Municipality of Anchorage
MSB	Matanuska-Susitna Borough
MSBSD	Matanuska-Susitna Borough School District
NCOA	Noncommissioned Officers Academy
NEI	Northern Economics, Inc.
PACAF	Pacific Air Forces
PCS	Permanent Changes of Station
PEA	Programmatic Environmental Assessment (Army)
PFD	Alaska Permanent Fund Dividend
POA	Port of Anchorage
REMI	Regional Economic Model, Inc.
TIGER	Topologically Integrated Geographic Encoding and Referencing shape files
USARAK	U.S. Army Alaska

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Executive Summary

In July 2015, the U.S. Army announced that Alaska's 4th Airborne Brigade Combat Team of the 25th Infantry Division (hereafter referred to as the 4-25th) stationed at Joint Base Elmendorf-Richardson (JBER) would be downsized over the next 27 months by 2,630 active duty soldiers by the end of fiscal year (FY) 2017. The downsizing of the 4-25th would be part of federal budget driven cuts of as many as 30,000 soldiers throughout the U.S. Army.

When the cuts to the 4-25th were initially announced, the Municipality of Anchorage (MOA) applied for and received a Department of Defense (DOD) grant to conduct an independent study of the economic impacts of the force reduction on the MOA and in the Mat-Su Borough (MSB). In February 2016, the MOA awarded a contract to a study team consisting of Northern Economics Inc., an Anchorage-based economics consulting firm and the Anchorage office of AECOM, Inc. a global technical services firm.

The proposed force reductions throughout the Army have been controversial, but the cuts to the 4-25th were particularly so, given the increasing threats to the Arctic from Russian forces as argued by U.S Senator Dan Sullivan and members of Alaska's Congressional delegation. On March 21, 2016, the U.S. Army officially "delayed" the force reduction, implying that the reduction is no longer in play in the current round of discussions. However, usage of the word "delayed" also implies that the reduction could be revisited.

Notwithstanding of the official delay of the force reduction, the study has been completed so that the MOA, the DOD, and members of the public can better understand the potential impacts of proposed force reduction. For purposes of the analysis, it was assumed that a future reduction of 2,630 soldiers from the 4-25th at JBER (the same magnitude as originally announced) would begin in the summer of 2017 and be completed by the end September 2019 (the end of FY 2019).

One key finding of the study is that in general, information about the 4-25th and U.S. Army Alaska's (USARAK) activities at JBER is not well understood by many members of the public. There seemed to be a general awareness that reductions at JBER had been proposed, but the context of those reductions relative to JBER as a whole was missing. Based on assigned strength levels supplied by JBER, the proposed reduction represents approximately 23 percent of the 10,204 active duty personnel assigned to JBER as of January 2016; however, some members of the public appeared to have been under the impression that the cuts would be much larger or even that the whole base would be closing.

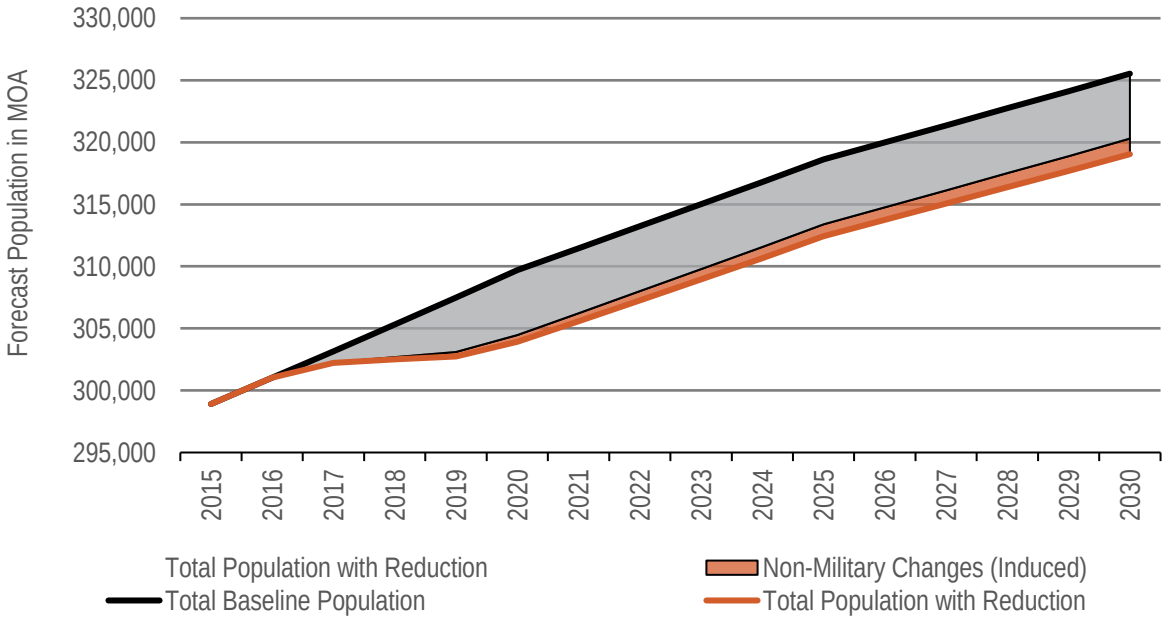
While the cuts would reduce USARAK personnel at JBER by approximately 51 percent, both the Army and the Air Force would continue to have a major presence in Anchorage. In addition to its active duty forces, JBER is also the home base for 3,328 reserves and guard personnel, and, as of January 2016, employed an additional 3,562 civilians. The study notes that the proposed force reduction would have little or no effect on these personnel and employees.

Another key finding of the analysis is that while the proposed reduction for the 4-25th would be an important economic event, it is unlikely to significantly alter the general trends of population and employment growth in the MOA and the MSB. This is demonstrated in Figure ES-1, which shows the baseline population forecast for the MOA along with the forecast population assuming the proposed force reduction occurs in beginning in 2017. In the figure, the baseline population forecast is shown as the solid black line.[1] The reduction in military personnel from the 4-25th along with their spouses and

[1] The baseline population forecast mirrors the most recent population forecast from the Alaska Department of Labor and Workforce Development (ADOLWD, 2016), which was published in April 2016.

children (the direct change resulting from the force reductions) are represented as the gray shaded area. As of result of the reduced military population and its spending, other changes (reductions) in employment are induced, which in turn result in further reductions in population growth, primarily through reduced levels of in-migration into the MOA.[2] The non-military (induced) population change is represented by as the orange shaded area in the figure. In the MOA, we project that by the end of the phased reduction there would be 5,233 fewer soldiers and their dependents. While the reductions in the military population stabilize in 2020, the induced population changes continue to increase steadily for a longer period, and are actually still increasing by 2030, when we project the induced population impact would reach 1,256 persons. We reiterate here that the non-military (induced) population change will be a reduction in the rate of in-migration, rather than a result of current MOA residents choosing to leave.

Figure ES-1. MOA Population Forecast with Military and Non-Military (Induced) Changes

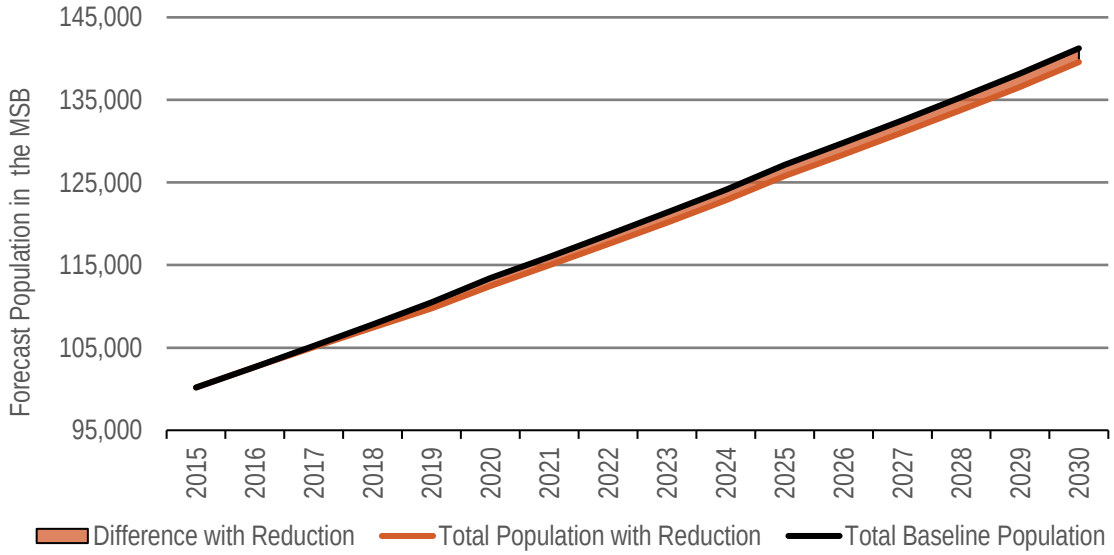


Source: Developed by Northern Economics using the Alaska REMI Model.

The study estimates that approximately 11 percent of the total military population associated with the 4-25th (soldiers and their dependents) live in the MSB. With the proposed reduction, we project that the 2030 population in the MSB will be reduced by 1,664, a 1.2 percent reduction from the baseline population projection of over 141,000 (see Figure ES-2). Of this total, 638 are soldiers and their dependents (38 percent of the total forecast population change) while 62 percent of the total change is an induced change (i.e. non-military) resulting primarily from reductions in the rate of in-migration to the MSB, rather than a result of current residents choosing to leave.

[2] As opposed to increased levels of out-migration.

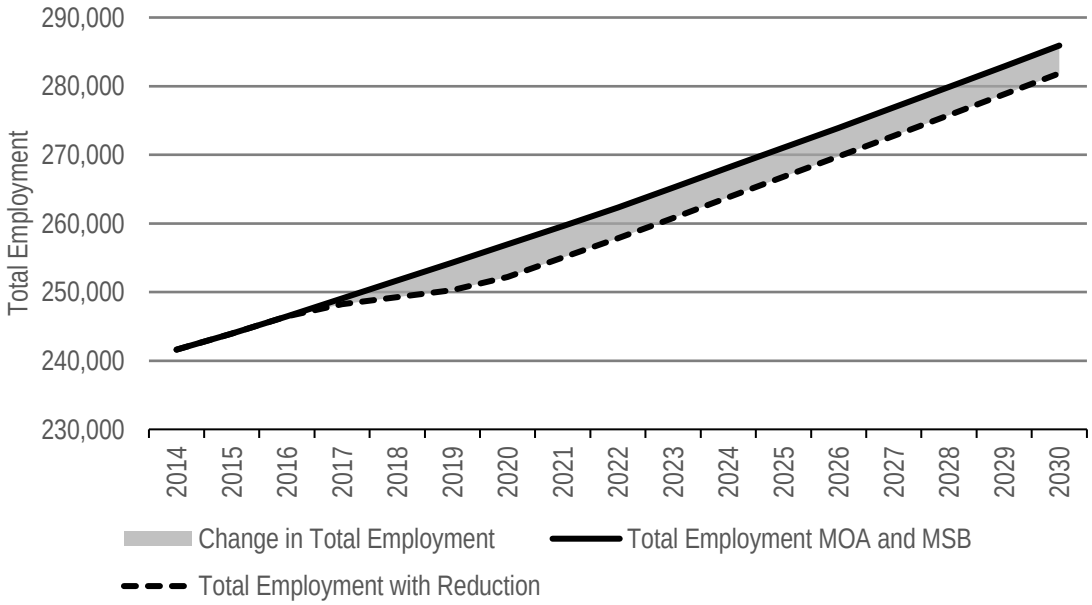
Figure ES-2. MSB Population Forecast with Changes in Military Population and Other Induced Changes



Source: Developed by Northern Economics using the Alaska REMI Model.

As with population, total employment in the MOA and MSB is forecast to increase into the future under both baseline conditions and with the proposed force reduction. With the reduction in the 4-25th, the study forecasts 4,720 fewer jobs by 2020 than in the baseline. Approximately 55 percent of the change is represented by the 2,630 fewer active duty soldiers, while the remaining 2,090 jobs are indirect and induced changes. It is important to note here that employment impacts do not necessarily mean employees will be laid off in the future, but rather, that fewer jobs will be created with the reduction than would have been created under the baseline.

Figure ES-3. MOA and MSB Employment Forecast with and without Force Reduction

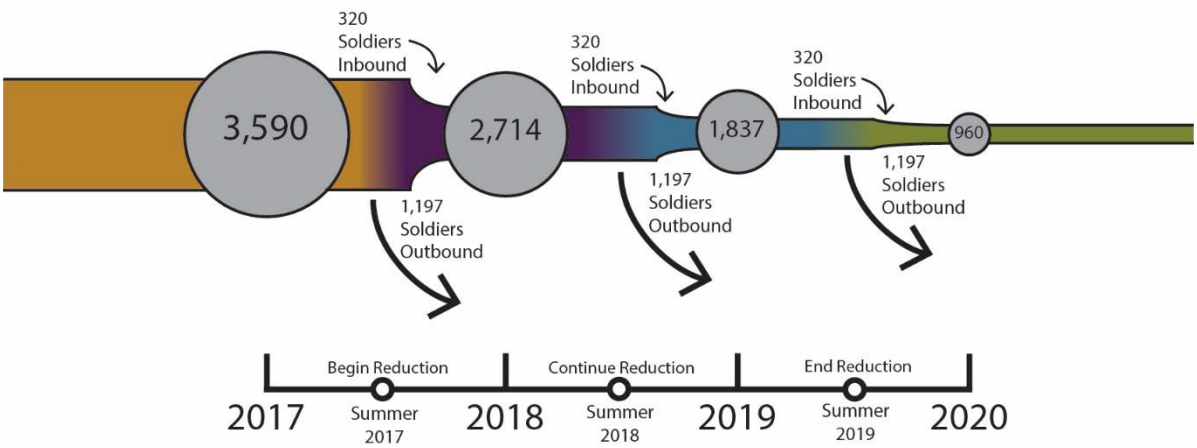


Source: Estimated by Northern Economics using the Alaska REMI Model.

As shown in the figures above summarizing projected changes in population and employment, the full effect of the projected impacts do not occur until 2019 and 2020. This is a result of the assumption based on the initial announcement by the U.S. Army that the reduction will be phased in over a period of time. This assumption was backed up by key informants indicating the reduction would most likely be accomplished through the regular and ongoing 3-year rotation cycle in which soldiers currently serving in the 4-25th are transferred out and replacements are transferred in. The phasing in of the force reductions has a mitigating effect on the impacts, although it should be noted that the U.S. Army could implement the reduction much more quickly if it chose to do so.

Figure ES-4 demonstrates the assumed reduction schedule used in the analysis, noting that USARAK sources could not provide a more specific or official reduction schedule. As shown in the figure, the phased-in reduction schedule assumes that 1,197 soldiers (one-third of the current force level of the 4-25th) would be transferred out over three successive summers and that they would be replaced by a smaller incoming contingent equal to one-third of the new reduced force level of 960 soldiers. As shown in the figure, 2020 would be the first full year under the new configuration, even though the downsizing would be technically complete in 2019.

Figure ES-4. Graphical Representation of the Phased Reduction from 3,590 Soldiers to 960 Soldiers



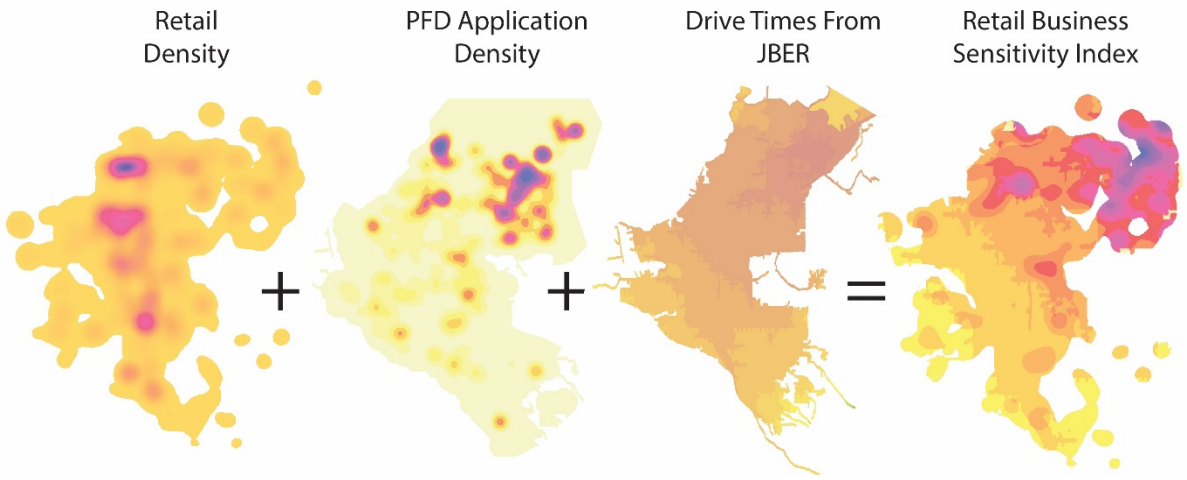
Source: Developed by Northern Economics.

In addition to population and employment changes described above, the proposed force reduction will lead to changes from the baseline forecast of similar proportions in most economic indicators including wages and salaries, retail sales, and overall personal consumption. As with population, the overall magnitude of these indicators generally continues to grow in the future out through 2030; the growth is, however, slower with the force reduction than without. The report delves into all of these indicators at significant levels of detail. We also examine impacts in other components of the socioeconomic fabric of the region, including racial and ethnic diversity, the housing market, personal consumption, retail sales, and impacts to schools.

Finally, we find evidence that the socioeconomic impacts of the proposed force reduction will not be uniformly distributed across the region. It is likely that negative impacts will occur in higher concentrations near where military personnel live. It is also intuitive that areas closer to the JBER access gates will notice a higher degree of change than areas further away. The analysis includes several exercises highlighting or calculating this spatial relationship. Retail establishments, for example, are especially sensitive to the geographic proximity of their clientele. Figure ES-5, focused on the city of Anchorage, highlights the steps the project team used to estimate retail sensitivity in terms of the military

reduction. From left to right we begin by identifying possible retail locations. Second we calculate the density of military residences per square mile (through PFD applications), and third we calculate the time it takes to drive to a retail location from the base. The end result sums together rankings of the aforementioned steps, and reveals retail locations most vulnerable to military reduction (shown in dark blue and maroon). Additionally, the report provides information on military residence by community, geographic representation of military housing by type, and geographic representation of military enrollment in public schools.

Figure ES-5. Retail Sensitivity Calculation



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1 Introduction

In July 2015, the U.S. Army announced that Alaska's 4th Airborne Brigade Combat Team of the 25th Infantry Division (hereafter referred to as the 4-25th) would be downsized over the next 27 months by 2,631 active duty soldiers by the end of fiscal year (FY) 2017.[3] The downsizing of the 4-25th would be part of a cut of as many as 30,000 soldiers throughout the U.S. Army, driven primarily by federal budget cuts (Tice, 2015).

The proposed force reductions throughout the Army have been controversial, but the cuts to the 4-25th were particularly so, given the increasing threats to the Arctic from Russian forces as argued by U.S Senator Dan Sullivan (Sullivan, 2016). On March 21, 2016, the U.S. Army officially "delayed" the force reduction, implying that the reduction in no-longer in play in the current round of discussions. However, the language also implies that the reduction could be revisited.

When the cuts to the 4-25th were initially announced, the Municipality of Anchorage (MOA) applied for and received a Department of Defense (DOD) grant to conduct an independent study of the economic impacts of the force reduction on the MOA and in the Matanuska-Susitna Borough (MSB). In February 2016, the MOA awarded a contract to a study team consisting of Northern Economics Inc., an Anchorage-based economics consulting firm and the Anchorage office of AECOM, Inc. a global technical services firm. Regardless of the official delay of the force reduction, the project still hopes to understand the potential impacts of force reduction as proposed.

The 4-25th is part of the U.S Army Alaska (USARAK)[4] and is based at Joint Base Elmendorf Richardson (JBER) located within the MOA—see Figure 1 on the following page. The USARAK contingent at JBER includes approximately 4,600 soldiers comprising the 4-25th, the USARAK's headquarters division, the 17th Combat Sustainment Support Battalion, and a Noncommissioned Officers Academy. In addition to the USARK personnel, JBER is home to the Alaskan Command and the 11th Air Force, which combine to add another 5,600 Airmen, bringing JBER's active duty personnel estimate to 10,200 troops.

Identifying and understanding the magnitude of impacts is important for multiple reasons. Documenting the potential social and economic impacts in an objective and unbiased way can inform decision makers and the public and lead to more meaningful discussions based on accurate information. Moreover, knowing in which economic sectors and locations they are most likely to be felt can help local government agencies more effectively plan and direct public resources in the event that reduction eventually does take place.

In this study, the Northern Economics, Inc. (NEI) study team of Alaska-based consultants employs qualitative and quantitative approaches to assess the larger economic impacts of the proposed force reduction. Rather than focusing on an immediate reduction that would have started in July 2015, the study assesses the impacts of a future reduction of the same magnitude—a reduction of 2,631 soldiers—but phases in the reduction over a three-year period starting in June 2017 and running through July 2019 consistent with the 3-year rotation schedule employed by the U.S. Army.[5]

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[3] The Federal Fiscal Year runs from October 1–September 30, with the year number corresponding to the calendar year in which the fiscal year ends. Thus FY 2017 runs from October 1, 2016 through September 30, 2017.

[4] USARAK also includes the 1st Stryker Brigade Combat Team of the 25th Infantry Division, and the Northern Warfare Training Center, both of which operate out of Fort Wainwright in Fairbanks, Alaska.

[5] USARAK sources indicated that they had not developed a plan for a two-year phase-in of the reduction, and could not provide assistance on this issue. Without this guidance, the study team was not able develop a two-year phase-in that did not significantly disrupt the 3-year rotation schedule on which the Army operates. Rather than presume to disrupt that schedule a simplified three-year phase-in was adopted for purposes of this analysis.

Through public meetings, focus groups, and key informant interviews, this study also identifies several key sectors for special consideration including retail (e.g., car dealerships, shopping malls), moving and storage companies, restaurants and bars, housing, education, and transportation, among others. Finally, various mapping exercises provide a more accurate picture of the geographic locations where many impacts will take place in the context of the MOA and the MSB.

Figure 1. Location of JBER within Anchorage and the Surrounding Area in the Matanuska-Susitna Borough

Source: Northern Economics

1.1 Organization of this Report

The reminder of this introductory section contains a general description of the methodology used in this analysis. The remaining Chapters of the report are briefly described below:

- Chapter 2 describes the baseline conditions in terms of JBER and the 4-25th, Municipality of Anchorage, and Matanuska-Susitna Borough.
- Chapter 3 contains a summary of the potential impacts expressed by members of the public during stakeholder meetings and the public process.
- Chapter 4 summarizes the quantitative impacts of the proposed reduction from a regional perspective. The Chapter contains the primary results of the Alaska REMI Models simulations including, impacts to population and demographics, employment and wages, personal consumption, and housing.
- Chapter 5 drills down to examine selected impacts at a more detailed level of focus than presented in Chapter 4. Many of the issues discussed in the Chapter were developed in response to comments and concerns expressed by the public or by the BEAR Working Group, and many use Geographic Information Systems (GIS) software to describe impacts from a geographic perspective. Separate sections address population and housing effects by community, likely impacts to the retail sector, and impacts to school districts.
- Chapter 6 contains potential recommendations for mitigating some of the impacts. This Chapter is considered to be an early draft and would benefit from input from the MOA and the BEAR Working Group.
- Chapter 7 lists the cited references.
- Appendices A–D provide additional details for: A) Soldiers and Compensation by Unit the 4-25th, B) calculations to determine numbers of students from the 4-25th by school district, C) Specification and additional details of the econometric analysis to assess impacts to ML&P.

1.2 Methodology

The study team used a three-pronged approach to assess and demonstrate the impacts of the force reduction:

1) A Stakeholder Input and Public Process aimed at gathering qualitative input on potential impacts and impact areas;
2) A quantitative approach using the Alaska REMI Model, which has been developed Regional Economic Models, Inc. of Amherst, MA and Northern Economics in a collaborative process;[6]
3) A geographic data-based approach that integrates geo-spatially linked data from the MOA and MSB, school districts, U.S. Census Bureau, and the Permanent Fund Dividend with mapping technologies found in GIS software to analyze and display results.

1.2.1 Stakeholder Input and Public Process

The study team collected and analyzed qualitative data from key stakeholders and the general public after working closely with the MOA's Base Economic Analysis Review Working Group (BEAR Working

[6] (See www.remi.com for more information about REMI.)

group) to develop mechanisms for stakeholder input. The stakeholder process facilitates incorporating public comments that are more qualitative in nature into the study analysis. It creates a detailed and informative picture of how a potential force reduction at JBER could impact specific economic sectors, geographic areas, and stakeholders. It also serves to identify public concerns, gather ideas for mitigating adverse impacts, and understand perceptions of potential impacts. In the end, the stakeholder process provided key guideposts for the development of the quantitative assessment.

The stakeholder process included four mechanisms to gather input—public meetings, focus groups, key informant interviews, and surveys. Comments from public meetings, focus groups, and key informant interviews were recorded, and all four mechanisms provided information for a summary of findings and expected impacts.

Figure 2 shows the interrelation of the stakeholder input mechanisms to gather qualitative data for the report. The green boxes (public meetings and surveys) denote mechanisms which were open to the general public. The blue boxes (focus groups and key informant interviews) denote mechanisms where individual stakeholder representatives in the community were invited to participate.

Figure 2. Mechanisms of Stakeholder Input

Source: Figure developed by AECOM Technical Services.

1.2.1.1 Public Meetings

Two public meetings were held in March 2016 to collect public input for the economic assessment. Meetings were advertised via community calendars, press releases, and emails to community council representatives. In addition, local media ran stories about the upcoming meetings prior to their occurrence. Television, newspaper, and radio stations also ran stories after the public meetings were held, summarizing the study effort. The meetings were scheduled early in the process in order to present the intent and scope of the study and to obtain input on concerns to address.

The first meeting was held in Northeast Anchorage at Begich Middle School, and the second meeting was held in Eagle River at Gruening Middle School. The public meeting locations were chosen because it is likely the potential impacts from a reduction in JBER Army forces would be felt most acutely in Northeast Anchorage and Eagle River. The information presented at the meetings was the same. Table 1 summarizes the dates and locations of the two public meetings.

Table 1. Public Meetings

Public Meeting	Location	Date	Number of Attendees
Public Meeting #1	Begich Middle School; Anchorage, AK	March 8, 2016	23
Public Meeting #2	Gruening Middle School; Eagle River, AK	March 9, 2016	28

The public meetings were open to anyone who wished to attend. This differs from the focus groups and key informant interviews where attendance was by invitation from the research team to target specific stakeholders that could be disproportionately affected by force reduction. Anchorage, Eagle River, Chugiak, and some Matanuska-Susitna Valley residents attended the public meetings. Senator Bill Wielechowski with the Alaska State Legislature gave opening remarks at the Anchorage meeting, and Mayor Ethan Berkowitz gave opening remarks at the Eagle River meeting. Members of the BEAR Working Group attended and were acknowledged during the meetings, with Chair Bill Popp also providing opening statements.

A brief overview of the study was given with a supporting PowerPoint presentation, followed by a moderated open discussion. Attendees were invited to share comments and questions, which were recorded. Printed copies of the PowerPoint and the online survey were available for meeting attendees.

1.2.1.2 Focus Groups

Focus groups are a facilitated discussion with participants that have similar interest in the study. The focus groups are meant to engage a cohort of specific stakeholders to discuss the role the military plays in their specific endeavors, potential impacts of the proposed force reduction, and recommendations to remedy the impacts. Six focus groups were held during March 2016. Table 2 notes the topic for each focus group and the date it was held.

Table 2. Focus Groups

Focus Group	Date
Off-Base Housing/Real Estate Focus Group	March 3, 2016
Large Scale Retail and Beverage Focus Group	March 10, 2016
Small Retail Food and Beverage Focus Group	March 11, 2016
Community Council Focus Group	March 16, 2016
Recreation and Tourism Focus Group	March 18, 2016
MOA Assembly Members	March 25, 2016

Focus group participants were selected through recommendations from the BEAR Working Group, JBER, industry and professional groups, and associations. Participants were also chosen by their proximity to JBER gates, with an emphasis on Northeast Anchorage, the Mountain View neighborhood in Anchorage, the Government Hill neighborhood in Anchorage, and Eagle River. Representatives of the Matanuska-Susitna area were also included in some focus groups. Several individuals were

contacted for each focus group, although in many cases, only a few were able to attend. If a contact was unable or not interested in attending a focus group, they were offered a link to the online survey to provide input for the study. Attendees of the focus groups were also sent the survey link after attending, and were encouraged to share this link with others in the community.

Two of the focus groups covered retail interests, with one group composed of small scale retail and the second representing large scale retail. Focus groups were also conducted with respect to off-base housing and real estate, neighborhood community councils, the recreation and tourism industries, and MOA Assembly members. The focus groups were moderated, and resulted in rich discussions which were recorded to provide qualitative data. To facilitate a frank discussion, participants were assured confidentiality so that specific comments would not be attributed to specific individuals.

1.2.1.3 Key Informant Interviews

Key informant interviews were held with individual representatives of specific stakeholders to obtain information similar to that sought with the focus groups. The selection criteria for key informant interviews were similar to those used for focus groups: recommendations, proximity to JBER, and stakeholders thought to be disproportionately affected by a force reduction. Table 3 lists the key informant interviews in chronological order. We note that the key informant interviews were conducted with a promise of anonymity, and therefore names of persons contacted are not provided in the table.

Table 3. Key informant Interviews

Key Informant	Date
Anchorage School District	Feb. 11, 2016
Matanuska-Susitna Borough School District	Feb 15, 2016
U.S. Army Colonel	Feb. 26, 2016
Gruening Middle School, Anchorage School District	Mar. 10, 2016
Alaska Railroad Corporation	Mar. 16, 2016
U.S. Army Colonel (Retired)	Mar. 17, 2016
Port of Anchorage	Mar. 17, 2016
Waste Connections, Inc.	Mar. 18, 2016
Artic Valley Ski Area	Mar. 20, 2016
World Wide Movers / Mayflower	Mar. 21, 2016
Municipal Light and Power	Mar. 21, 2016
Eklutna Inc., Eklutna Real Estate Services	Mar. 23, 2016
Alaska State Department of Labor and Workforce Development	Mar. 28, 2016
U.S. Army Colonel (Retired)	Mar. 29, 2016
JL Properties	Mar 30, 2016
ENSTAR	Mar. 30, 2016
Office of Veteran Affairs	Apr. 1, 2016
Anchorage School District	Apr. 5, 2016
Alaska State Department of Education and Early Development	Apr. 12, 2016
MSB Planning Director	Apr. 18, 2016
Outdoor Recreation Specialist at Joint Base Elmendorf-Richardson (JBER)	Apr. 18, 2016
Alaska Vocational and Technical School	Apr. 19, 2016
Team CC: Snowmachines and ATVs	Apr. 19, 2016
Wayland Baptist University	Apr. 20, 2016
MOA Service Sector: Fire Department	Apr. 20, 2016
MOA Service Sector: Police Department	Apr. 20, 2016
MOA Service Sector: Public Transportation Department	Apr. 20, 2016
MOA Service Sector: Water, Wastewater, and Utilities Department	Apr. 21, 2016
MOA Service Sector: Human Resources Department	Apr. 22, 2016
Mountain View Community Council	Apr. 25, 2016
Anchorage Community Land Trust	Apr. 25, 2016

1.2.1.4 Online Surveys

A community survey and a business survey accessible online were used to gather additional input from the general public. Printed copies of the community survey questions were made available at the public meetings, and the link to the survey was distributed to focus group contacts.

1.2.2 Quantitative Approach

The primary tool for the quantitative assessment for the proposed force reduction of the 4-25th was the Alaska REMI Model. This interactive database and predictive model has been developed exclusively for

Northern Economics in a collaborative process with Regional Economic Models, Inc. of Amherst, MA. (See www.remi.com for more information about REMI.)

In general, quantitative economic impact assessments of the proposed force reduction are likely to take one of two approaches: 1) the use of relatively simple but static input-output models, or 2) the use of a more comprehensive dynamic approach that integrates general equilibrium models of local economies using time series data on local employment, migration, commuting, and housing, with the production and spending matrices utilized in input-output models. Examples of input-output models include IMPLAN® and RIMS®, while the latter approach includes the Alaska REMI Model, and other models such as the Man in the Arctic Program Model developed by now-retired University Alaska Anchorage Professor Dr. Scott Goldsmith. The primary advantage of the latter class of models is that they are dynamic systems that recognize that shocks to an economy will take several years to settle out and reach a new equilibrium state.

Stand-alone input-output models, while useful for some applications, are inherently static and do not have mechanisms to deal with economic changes over multi-year periods, nor do they link to population and demographic changes. In addition, input-output models have no mechanism to adjust prices when there is an increase or decrease in demand, and implicitly assume that the supply of goods and services adjusts instantaneously in response to a change in demand.

Dynamic models, such as the Alaska REMI model, are multi-year models that explicitly capture changes over time, and for example, are able to show how the proposed force reduction is likely to affect housing prices in the years immediately following the change, and also farther out into the future as the economy adapts. Like input-output models, the Alaska REMI Model can show direct and indirect/induced changes to specific sectors in the economy. For example, we can predict how a reduction in active military employment is likely to affect spending and employment at Anchorage eating and drinking establishments, and in retail trade, as well as in other sectors of the local economy. The Alaska REMI Model can also produce estimates of demographic changes in response to changes in population and employment that result from the 4-25th force reduction. Understanding the demographic changes can inform potential programs that mitigate impacts on Anchorage and Mat-Su School Districts.

1.2.3 Details on the Alaska REMI Model

The Alaska REMI Model is based on REMI PI+, a structural economic forecasting and policy analysis model that integrates input-output, computable general equilibrium, econometric and economic geography methodologies. The model is dynamic, incorporating economic responses to wage, price, and other economic and demographic factors, into forecasts and simulations generated on an annual basis through the year 2060. Northern Economics believes that REMI models provide far superior results (compared to other impact modelling approaches) when applied to multi-year issues that have the potential to create significant changes in the structure of local and regional economies.

REMI PI+ models have been widely used by government agencies (including many state governments in the U.S.), by universities, by private and public and research and consulting firms, and by utilities for over 30 years. The equations in the model used for forecasting economic changes and effects are based on economic theory and empirical studies. REMI PI+ models are custom-built to address the specific analytical requirements of each client. REMI models can be used to conduct a macroeconomic analysis on a local, regional, state, as well as national basis, and can be specific to the industry composition and other economic characteristics of a particular area.

Across the U.S., there have been numerous REMI-based analyses that have examined the impact of closures and downsizing military facilities, including:

- Analysts in Maine used a REMI model to assess the impacts of the closure of the Brunswick Naval Air Station (http://mrra.us/wp-content/uploads/2013/03/Understanding_the_Impacts_SPO.pdf).
- Analysts at the New Hampshire Economic and Labor Market Information Bureau used their New Hampshire REMI model in 2005 to examine the effects of closing the Portsmouth Naval Shipyard http://www.nhes.nh.gov/elmi/products/documents/ec-remi-model.pdf
- Oklahoma State University Center for Economic and Business Development for used their REMI model to assess the economic impacts of the state's National Guard (http://www.okstatechamber.com/files/OKNGEconomicImpactReport2014.pdf).

Northern Economics began working with the REMI model developers in 2010 to build a model for analyzing the socioeconomic impacts of the Alaska Pipeline Project. The Alaska REMI Model has 12 Alaska sub-regions and 70 industry sectors. Nine of the twelve "regions" are the boroughs and census areas that are connected by rail and road from the North Slope Borough to the Kenai Peninsula Borough, including the MOA and the MSB. The 20 remaining Alaska boroughs and census areas have been aggregated in the Alaska REMI Model into three regions: the Northwest Alaska Region, the Southwest Alaska Region, and the Southeast Alaska Region.

Northern Economics supplied REMI with Alaska-specific data on employment, wages and salaries, population, commuter data, and housing prices for each of the 12 Alaska sub-regions in the model. These data were obtained from federal and state agencies that track Alaska-specific regional data. The baseline economic and demographic information in the REMI model uses trends from historical data with 2013 as the most recent year available. Baseline Projections on employment, economic output, income, and other economic indicators are based on the historical trends specified in the data that are embedded in the model and have been calibrated to match population and employment forecasts developed by the Alaska Department of Labor and Workforce Development (ADOLWD).[7]

1.2.3.1 REMI Modelling Process

The following is a step-wise overview of the process that is used to generate quantitative results of the economic assessment of the 4-25th force reduction using the Alaska REMI Model.

1) Calibrate the No-Action Baseline against which the force reductions is measured. The no-action baseline represents the MOA and the MSB from 2011 out through 2030.
2) Input the economic shocks to the baseline caused by force reduction:
    a. Model inputs are primarily the direct reductions in Active Duty Military employment and compensation in the MOA, along with reductions in Military Populations (soldiers plus spouses and children). Employment and Compensation is based on the place of work (i.e. at JBER in the MOA) while reductions in Military Populations will be seen in both the MOA and the MSB.
    b. Other direct spending reductions of the 4-25th were calculated by the project team and include reductions to the moving and storage industry (see Section 5.6), reductions in

[7] Baseline forecasts in the Alaska REMI model are calibrated to ADOLWD employment forecast from 2014 (Martz, 2014) and populations forecasts from 2016. (ADOLWD, 2016)

expenditures for waste collection, electricity, natural gas (see Section 5.5), and other small changes to selected sectors.[8]

3) Summarize the incremental changes between the No-Action Baseline and proposed reduction in the 4-25th in terms of population, demographics by age, gender, and ethnicity; and employment in key industry sectors and for other economic indicators.

It is important to note that the baseline forecasts for this analysis do not attempt to incorporate the potential impacts resulting from the recent and significant decline in oil prices and revenues or the state's fiscal crisis those low prices and revenues have engendered.

1.2.4 Geographic Based Approach

Geographic Information Systems or GIS was used extensively for this report to analyze and display data. GIS may imply a single piece of software or a series of models and frameworks built across multiple systems. In this report, the term GIS refers to "An integrated collection of computer software and data used to view and manage information about geographic places, analyze spatial relationships and model spatial processes." (ESRI, 2016).

Geographic data related to socioeconomic conditions affected by the force reductions were collected from private, local, state and federal sources. These data were compiled in a central repository and used to generate maps and summary reports using industry standard Environmental Systems Research Institute (ESRI) GIS software. Listed below are examples of data sources:

- MOA (Permanent Fund Dividend Data, land use, parcels, ownership, taxable values, subdivisions, tax codes areas, zoning, addresses, roads, facilities, schools, etc.)
- MSB (borough-related data similar to Anchorage)
- U.S. Census Bureau (TIGER and Summary files for housing, population, employment and income)
- InfoGroup Verified Business Data (business locations, NAICS code, type, size etc.)

A project map template was created as data were collected and thematic maps, depicting location-specific distributions, were created. These maps allow the analysis to define a geographic extent which is most effected by a reduction in personnel.

Several different GIS methods were employed to calculate and display geographic impacts:

Geocoding

Geocoding is a method of using GIS to assign geographic locations to tabular data. Once these data are assigned locations, it is possible to view and analyze trends that may otherwise have been difficult to visualize by looking at the raw tables or simple charts alone. To set up the geocode, GIS road system layers from both the MSB and MOA were collected. These road system layers contain standardized fields for street names, prefixes, suffixes and block address ranges. A custom ESRI address locator was formatted for each road system layer. The database of digital addresses was cross-referenced by the address locator to match the raw addresses to the road system by ESRI ArcGIS using a series of word recognition algorithms. The geocoder is designed to allow flexibility in spelling and formatting errors while reporting a matching score the user can determine acceptable or unacceptable. The final result

[8] While a complete closure of a base will generate a wide range of other indirect and induced spending impacts in the local economy, the downsizing of a particular unit within a larger installation will have a relatively small impact. This is because most of the "fixed costs" of the installation remain.

of a geocode is a new GIS point layer representing all, or a majority of, the original address based data spatially.

Drive Times

Drive time layers refer to a GIS polygon or area that groups a region of like drive times measured in time units. Drive time polygons were developed from a location on base and compiled in 5 minute intervals for a total drive time of 2 hours. This analysis uses the proprietary premium ESRI road network which contains detailed road segment length, speed limits, stop signs and other spatial traffic pattern data to develop the resulting polygon layer.

Density Calculations

Density of the occurrence of PFD military residences and business locations was calculated by converting the point locations to a continuous surface showing the number of PFDs and or Businesses per square mile. The software computes density based on a search distance and area unit. The search distance of 1,000 feet was used and the area unit of square miles. These data were stored in an ESRI geodatabase raster dataset with 100 foot pixel resolution. Data were exported as a polygon layer to match the drive time polygons for use in the suitability analysis.

Suitability Analysis

Suitability analysis or "weighted site selection" is a mechanism commonly used to find the best and/or worst locations based on a set of pre-defined geographic criteria. Suitability analysis allows its user to gather many geographical layers and rank their attributes relative to importance. Layers are overlaid on top of one another and rankings are ultimately summed to make determinations on the suitability of one location over another based on aggregate scores. See section 5.3.1 for more detail.

2 Affected Environment

In order to understand the impacts of the proposed reduction in the size of the 4-25th, we first need to gain a better understanding of the configuration of the brigade as it currently exists. We also need to understand the relationship between the 4-25th and USARAK, as well as the relationship between USARAK and the Alaskan Command. It was evident in the public meetings, focus groups, and even in some of the key informant interviews that many members of the public at large were not fully aware of the differing roles of these entities or the relationships between them.

It is also clear that an understanding of impacts of a force reduction on the MOA and the MSB requires an understanding of the socioeconomic context in which the changes take place. This chapter addresses this context and is divided into three parts:

- Section 2.1 provides an overview of the JBER and the USARAK forces at JBER as well as a relatively detailed profile of the 4-25th.
- Section 2.2 provides a relatively detailed summary of the historic, current and projected future socioeconomic conditions in the MOA.
- Section 2.2 summarizes the historic, current and projected future socioeconomic conditions in the MSB.

2.1 JBER and the 4-25th

JBER, as implied by its Joint Base designation, comprises both Army and Air Force Units, with the Air Force taking the lead on operations and maintenance of the base as a whole. Because this report focuses on the proposed force reduction within the 4-25th, the information we supply about the remaining USARAK and Air Force components of JBER (JBER-Elmendorf) is provided at a fairly high level.

JBER came into being through an agreement between the Vice Chiefs of the Air Force and Army signed on October 9, 2009. The agreement, made in an effort to consolidate services and improve efficiency, formalized long-held plans to merge Elmendorf Air Force Base with the Army's Fort Richardson into a single joint base. In the agreement the transition was scheduled to begin in January 2010 and completed by October 2010. (Halpin, 2010). The JBER agreement was one of twelve Joint Base agreements/developments around the country.

The U.S. Air Force and more specifically the Alaskan Command is the lead organization at JBER. The Alaskan Command falls within U.S. Northern Command under the 11th Air Force. The 11th Air Force falls within the larger Pacific Air Forces (PACAF), which also comprises the 5th Air Force and the 7th Air Force. PACAF bases include JBER in the MOA and Eielson Air Force Base in North Pole, Alaska as well as bases in Hawaii, Guam, South Korea, and Japan (PACAF, 2016).

The Alaskan Command is "responsible for maximizing theater force readiness for 21,000 Alaskan service members and expediting worldwide contingency force deployments from and through Alaska." These forces include members of the U.S. Airforce, the U.S. Army, the U.S. Navy and U.S. Marine Corps personnel at JBER and Eielson AFB. In addition the Alaskan Command includes approximately 4,700 guardsmen and reservists. (JBER, 2016).

JBER regularly publishes an *Installation Fact Sheet* (PACAF, 2016b). The January 2016 version indicates that there are a total of 10,204 active duty personnel assigned to JBER with 5,515 airmen and 4,689

soldiers.[9] JBER is also the home base for 3,328 reserves and guard personnel, and at the time of publication employed an additional 3,562 civilians. The fact sheet also provides an indication of total payroll at JBER ($909.2 Million), the overall operations and maintenance expenditures ($92.3 Million), an estimate of the base's economic impact in Alaska ($1.6 billion) and a summary of JBER's Real Property and On-Base Housing.

The primary information from the *Installation Fact Sheet* is reformatted and reproduced below as Table 4. We note here that the U.S. Military operates on a July–June Fiscal Year (FY), and reiterate that at JBER, the Air Force is responsible for general base operations (O&M) and for Military Family Housing (MFH). Based on conversations with JBER personnel (PACAF, 2016b and USARAK, 2016) reports showing the number of active duty personnel change quite frequently as personnel in both forces shift from assignment to assignment. The number of personnel shown in Table 4 is a snapshot for that particular date. Other numbers are more stable—the number of acres on the base and the number of housing units for example.

Table 4. Joint Base Elmendorf-Richardson Installation Fact Sheet (27 Jan 2016)

Category	FY 2016
Air Force Personnel	5,515
Army Personnel	4,689
Total Civilian Personnel	2,485
Reserve/Guard Component Military	3,393
Dependent Population	16,838
Total Base Population	**32,920**

Retirees in the Local Area	10,754

Annual Operating Budget		
	O&M: (AF Only)	**MFH: (AF Only)**
FY 15 – Program	$232,354.5K	$1,379.0K
FY 16 – Program	$191,872.4K	$1,600.0K

Real Property Summary	
Total Acreage	79,006 acres
Training Acreage	49,620 acres
Total Building Space: 959	14.9 million sq. ft; 1.38 sq. meters
Family Quarters	3,262
Unaccompanied Personnel Housing	3,585 Total Units
Occupancy Rate:	72% (AF 95%, AR 64%)

Source: Reproduced (with some reformatting) from Installation Fact Sheet (PACAF, 2016b).

[9] Information on the JBER internet site indicates that the base is also home to units of the U.S. Navy, the Marine Corps, and the U.S. Coast Guard.

2.1.1 The U.S. Army Alaska

The 4-25th is a part of the USARAK, which, in addition to units at JBER, includes units stationed at Fort Wainwright in Fairbanks. The JBER components of the USARAK includes the headquarters detachment, the 4-25th, the 17th Combat Sustainment Support Battalion (17th CSSB), and the Noncommissioned Officers Academy (NCOA). If fully staffed at levels authorized by its Table of Organization and Equipment (TOE), the USARAK at JBER has 4,600 soldiers.[10] Of these, 3,590 soldiers are authorized for the 4-25th, and 743 soldiers are authorized for the 17th CSSB. The USARAK headquarters detachment and the NCOA are authorized 243 and 23 soldiers respectively (USARAK, 2016).

2.1.1.1 Information Provided to Analysts from Military Sources

A key component of any impact assessment is the availability, timeliness and reliability of information. Information about troop strengths and changes in troop strengths is viewed as sensitive information, and potentially harmful if too much information is provided, or if it is used inappropriately. The sensitive nature of the information that was requested by project analysts, as well as the apparent reality that some information simply isn't collected, or if collected is not stored in central databases accessible to persons without specific clearance levels, has had an impact on this analysis.

In this sub-section we describe several key information components regarding JBER, USARAK and the 4-25th. Our key source of information on USARAK and the 4-25th for this project has been Dr. Mollie TeVrucht, a Project Manager working for USARAK as a DOD civilian employee. In addition, Captain Julie Hoxha of PACAF at JBER has provided information and contacts that have been invaluable.

Information on Troop Strength

In order to determine the impacts of a reduction in troop strength—the proposed force reduction of the 4-25th for example—it is important to know the troop strength before and after reductions. It is also important to understand how information about troop strengths are reported and distributed. This information is provided below.

Table of Organization and Equipment

One of the basic tools used by the U.S. Armed Forces and the DOD to report troop strength is the TOE. The TOE reports the prescribed or authorized organization, staffing and compliment of equipment for each unit. TOEs are uniform across similar units. For example the 1st Brigade Combat Team of the 82nd (1-82nd) Airborne Division based at Fort Bragg in North Carolina should have a TOE that is identical to the TOE of the 4-25th at JBER. The TOE of the 4-25th, and presumably the TOE of the 1-82nd, as well as the TOEs of other Airborne Brigade Combat Teams (ABCTs) around the world, authorizes a total of 3,590 soldiers. (USARAK, 2016).

We note here that TOEs not only specify the total number of troops that are authorized for a particular type of unit, they also provide numbers by specific ranks and specialty.

The study team requested TOEs for all units at JBER, but in particular for the 4-25th and associated USARAK units. TOEs for all USARAK units at JBER were provided, but specific TOEs for Air Force units were not provided. It is not clear whether troop strengths indicated in the JBER Installation Fact Sheet (as shown in Table 4) represent TOEs or some variation of the TOEs. We do note that the number of U.S. Army soldiers shown in Table 4 (4,689) exceeds the number of soldiers (4,600) in TOEs provided by USARAK (2016) for all USARAK units at JBER.

[10] The term "soldiers" is used throughout this report is the general term for all Army personnel including both officers and enlisted personnel, and both males and females. The "airmen" will be used to refer to Air Force personnel.

Variations from the TOE

The number of actual soldiers officially assigned to a unit on any date may vary from its TOE. In most cases the Assigned Strength Level or ASL[11] ranges from 92–100 percent of the TOE. There are occasions when the ASL may be as low as 85 percent of the TOE and as high as 105 percent of the TOE (USARAK, 2016). As of May 2016, the 4-25th had an ASL of approximately 93 percent of it TOE. ASLs for other units within USARAK at JBER were not provided.

Rotations and Permanent Changes of Station

According to key informants as well as JBER and USARAK personnel (PACAF, 2016b, USARAK, 2016) both USARAK and PACAF employ a regular rotation of troops from one assignment to another. Under current practices, assignments to a particular posting typically last three years, and most Permanent Changes of Station (PCS) occur around during the summer months, and appear to take into account the soldier's situation in terms of dependents. As a result of the three-year rotation schedule, approximately one-third of the soldiers rotate out of each unit each year, and assuming the TOE for that particular unit is unchanged, soldiers leaving a posting will be replaced by an equal number of soldiers coming into the unit.

It is through this regular PCS schedule that changes in TOE for a particular unit are often implemented. If troop strengths are being built up, then there will be more incoming soldiers than outgoing soldiers. Similarly if the TOE is being reduced, then some of the outgoing soldiers will not be replaced with incoming soldiers.

Information on Wages/Salaries and Total Compensation

The study team requested information on the wages, salaries, and total compensation for all units at JBER with a particular emphasis on the need for information on the 4-25th. Along with TOEs, USARAK (2016) provided information on wages and salary by rank and grade. They also provided information on cost of living allowances (COLA) for Alaska, subsistence allowances for Alaska (Basic Allowance for Subsistence [BAS]), jump pay, and information on the Basic Allowances for Housing (BAH). In addition, information on weight allowances for moving household goods during a PCS were provided. All of this information was provided by rank and grade as applicable. In combination with the detailed information in the TOEs, the study team was able to use this information to develop reliable estimates of the total compensation provided to USARAK soldiers at JBER. Specific information for Air Force personnel was not provided, but the general information provided in the JBER Installation Fact Sheet (Table 4) was determined to be adequate since Air Force personnel were not being affected by the force reduction.

Information on Dependents

The study team requested information on the number and ages of dependents for the 4-25th specifically, and for other units stationed at JBER. The study team also requested information on the occupations of spouses who were not also active duty members of the military. This information, if it were available, would have helped determine population impacts, describe the labor force more accurately, and enhance estimates of impacts to schools.

According to both PACAF (2016) and USARAK (2016) specific information on dependents is not available. Information about dependents is known in general by members of each soldier's unit, and

[11] It is not clear that the term "Assigned Strength Level" is a term that is officially sanctioned by the Army. We have seen reference to both Assigned Strength and Attached Strength. This report will use the term ASL to mean the number of soldiers assigned or attached to a unit on a particular date.

perhaps more systematically by dependent support groups/units at installations. In any case, the study team was unable to access systematic data on dependents.

The study team was, however, provided estimated counts of dependents based on the current numbers of assigned soldiers. These estimates included the number of soldiers with spouses, including estimates of soldiers whose spouses were also in active duty. The study team was also provided "estimates" of the numbers of children by age group as well as estimates of the unmarried soldiers who had dependents other than spouses.

According to USARAK (2016), "the numbers of soldiers assigned here is changing constantly, especially this time of year. (Summer is the big PCS season.) People move on and off the installation, and they get married or divorced. Babies are born and children turn into adults. None of these numbers is precisely correct, but the overall picture is accurate."

Information on Physical Addresses of Soldiers Living Off-base

Information on the physical addresses of soldiers living off-base would have enhanced the precision of impact estimates of a force reduction on housing, housing prices, the retail sector, and schools.

As with dependent counts, the physical address of soldiers living off-base is not officially tracked. It is known whether or not soldiers live on- or off-base, and whether on-base soldiers live in the enlisted personnel quarters (i.e. "barracks") or whether the soldier lives in privatized on-base housing. Several military sources indicated that soldiers living off-base do report their address within their immediate unit in case there a need for emergency contact, but that these data are not systematically stored in accessible databases.

In Alaska there are at least three alternative sources of information on the off-base residence address:

1) The American Community Survey (ACS) conducted annually by the U.S. Census Bureau asks respondents whether they are active duty members of the military. ACS summary reports provide estimates of the number of active duty personnel and their dependents by census block group. These estimates suffer from a low sample size, and because active duty status is self-reported and not verified.

2) Both the Anchorage School District (ASD) and Matanuska-Susitna Borough School District (MSBSD) collect information from parents on their employers and in particular whether they are active duty members of the military. These data are helpful for locations of school age children, but do not include soldiers who don't have children, or whose children do not attend schools in these districts.

3) Alaska Permanent Fund Dividend (PFD) Applications: PFD applications ask whether the respondent is an active duty member of the military—i.e. military status is "self-reported". However, because applications are witnessed and because providing false information on a PFD Application is a punishable offense, it is presumed that PFD applications may be more reliable than the ACS data as a tool for determining the physical address of off-base residents.

All three of these sources for off-base residence addresses were investigated and will be discussed in more detail in later sections.

Information on Direct Expenditures by the 4-25th

Information on direct expenditures made by the 4-25th was requested from USARAK. While information on direct contracts awarded by the 4-25th was provided, other operational expenditures were not provided. Through discussions with key informants it was determined that with the exceptions of expenditures for electricity, and natural gas for heating, little of the other major categories of operational

expenses of the 4-25th are sourced in Alaska, and that the proposed reduction of the 4-25th would not have highly significant impacts outside of the personal expenditures of soldiers and their families.

2.1.2 The 4th Infantry Airborne Brigade Combat Team, of the 25th Infantry Division

The 4-25th is the only ABCT in the Pacific Theater. The 4-25th comprises seven individual units—the headquarters company, two infantry battalions, a cavalry squadron, an artillery battalion, an engineering battalion, and a support battalion. This level of detail allows for a better description of the proposed force reduction, noting that because the cuts to the 4-25th have been put on hold, USARAK has been unable to provide direction to the study team as to the eventual configuration of the restructured force.

This section contains a detailed description of the 4-25th as it is configured under its current TOE, along with estimates of payroll provided to soldiers. The section also includes summaries of the each of units' ASLs as of May 2016, and estimates of the dependent population (spouses and children and other dependents) living both on- and off-base. As indicated in Table 5, the 4-25th has 3,591 soldiers at full TOE strength with an estimated annual payroll of $253.4 million. At the ASL from May 2016, there were 3,351 soldiers with estimated annual payroll of $236.8 million. The current ASL force is 93.3 percent of the full TOE, but according to Key Informants the ASL is a snapshot and changes frequently, both up and down, depending on many factors, ranging from global politics to school calendars.

Table 5. TOEs and ASLs (May 2016) of Specific Units within the 4-25th

Unit	Table of Organization & Equipment	Estimated Annual Payroll at full TOE	Assigned Strength Level (May 2016)	Estimated Annual Payroll at the ASL of May 2016
4-25th Brigade Headquarters and Headquarters Company	147	$13,991,640	138	$13,106,741
1st Battalion (Airborne), 501st Infantry	654	$43,943,178	611	$41,043,194
3rd Battalion (Airborne), 509th Infantry	654	$43,943,178	611	$41,043,194
1st Squadron (Airborne), 40th Cavalry	369	$25,748,655	344	$24,011,815
2nd Battalion (Airborne), 377th Field Artillery	509	$36,434,813	475	$34,026,116
6th Brigade Engineering Battalion (Airborne)	415	$29,555,931	387	$27,594,434
725th Brigade Support Battalion (Airborne)	843	$59,608,424	785	$55,528,990
4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division	3,591	$253,424,206	3,351	$236,773,739

Note: Estimates of payroll include the Alaska COLA, monthly jump pay, Basic Allowance for Subsistence (BAS), and BAH.

Source: Developed by Northern Economics using data provided by USARAK (2016).

This report is highlighting the differences between the authorized strength as described by the TOE and the assigned strength shown in the ASLs for two primary reasons:

1) Information provided to by USARAK on military dependents is based on the ASL from May 2016.
2) Inclusion of the two sets of strength levels provide a framework for determination of upper and lower bounds of impacts of the force reduction.

2.1.2.1 Assumptions for Future TOEs and Payroll under Two Force Reduction Scenarios

This section provides projections of TOEs for the 4-25th if the proposed cuts of 2,630 soldiers were implemented, and alternatively if the eventual configuration of the 4-25th resembles the "Validated"

Airborne Task Force (ATF) as reported in a February U.S. Army news article (Parker, 2016). The "validated" task force would have an end-strength of 1,597 paratroopers rather than the more severe cuts originally proposed.[12]

Parker's article (2016) provides insight into the way that the 4-25th and other ABCTs may be transformed into smaller, more agile ATFs. The organization strategy described by Parker fits with the larger overall "Plug and Play" strategy of the U.S. Military as it strives to reorganize amidst new and emerging global challenges and fiscal austerity. This "plug and play" strategy is more fully developed in a document released by the Joint Chiefs of Staff in September 2012 (Joint Chiefs of Staff, 2012). In a foreword to "Capstone Concept for Joint Operations: Joint Force 2020", General Martin E. Dempsey (U.S Army Ret.)—the 18th Chairman of the Joint Chief of Staff from October 1, 2011–September 25, 2015, writes that in the concept of "Joint Force elements, globally postured, combine quickly with each other and mission partners to integrate capabilities fluidly across domains, echelons, and geographic boundaries, and organizational affiliations."

Paradoxically the "plug and play" strategy appears to mean that in order to gain the required **flexibility** to combine units across many dimensions, individual ABCTs, such as the 4-25th may need to become more **specialized**. For example, rather than maintaining their own artillery battalions and cavalry squadrons, it may be more efficient for a smaller ATFs to combine with separately maintained artillery and cavalry units on an as-needed basis.

In Table 6, below we document the study team's assumptions of the cuts needed to transform the 4-25th from an ABCT to an ATF under two alternatives:

1) A reduction of 2,630 soldiers to an ATF TOE of 960 soldiers
2) A reduction of 1,994 soldiers to the "validated" ATF TOE of 1,597 soldiers

Under the full reduction of 2,630 soldiers, the study team assumes the 4-25th transform to a 960 soldier ATF by shedding one of its infantry battalions,[13] its artillery battalion, its cavalry squadron, and its engineering battalion. In addition, the individual companies within the 725th Brigade Support Battalion (BSB) that had been directly affiliated with the eliminated units would be cut, as would the number of personnel in other more generalized companies within the support battalion. Finally the size of the headquarters company (HHC) would be reduced commensurate with the overall downsizing. With the full reduction to 960 soldiers, the payroll of the 4-25th would be cut by $184.3 million per year.

Under the Validated ATF, the 6th Brigade Engineering Battalion would be retained and there would be fewer reductions in the 725th BSB and in the HHC. Under this scenario payroll for the 4-25th would be reduced by $138.3 million per year.

[12] USARAK sources indicate there is no official plan for the configuration of 4-25th with proposed force reductions. Discussions with Key Informants and USARAK (2016) regarding the "plug and play" concepts discussed below gave the analysts confidence that the configurations assumed by the study team are reasonable.

[13] According to Key Informants, the two infantry battalions within the 4-25th are technically interchangeable. In the proposed reduction options, we assume the 1-501st is cut with the Validated ATF, and that the 3-509th is cut in the full reduction.

Table 6. Assumed TOEs under Alternative Scenarios for the Force Reductions

Unit	Validated ATF with a TOE of 1,597 Soldiers		TOE with a Force Reduction of 2,630 Soldiers to 960 Soldiers	
	Table of Organization & Equipment	Estimated Annual Payroll	Table of Organization & Equipment	Estimated Annual Payroll
4-25th Brigade HHC	106	$10,346,879	80	$7,854,947
1st Battalion (Airborne), 501st Infantry	The entire unit is cut		654	$43,943,178
3rd Battalion (Airborne), 509th Infantry	654	$43,943,178	The entire unit is cut	
1st Squadron (Airborne), 40th Cavalry	The entire unit is cut		The entire unit is cut	
2nd Battalion (Airborne), 377th Field Artillery	The entire unit is cut		The entire unit is cut	
6th Brigade Engineering Battalion (Airborne)	415	$29,555,931	The entire unit is cut	
725th Brigade Support Battalion (Airborne)	422	$31,080,997	226	$17,116,298
4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division	1,597	$114,926,986	960	$68,914,424

Note: Estimates of payroll include the Alaska COLA, monthly jump pay, BAS, and BAH.

Source: Developed by Northern Economics using study team assumptions on reduction protocols and on data provided by USARAK (2016).

Assumptions Regarding the Phasing of Force Reductions

While the study team asked for guidance as to how the proposed reductions would be phased in, sources at JBER and USARAK indicated that no plans for the phasing-in of the reduction had been developed, but that the primary method would be to utilize the regular rotations in and out of the unit to make the reduction. Given this information and the lack of other guidance, the analysts developed a "phasing plan" strictly for purposes of the analysis.

For purposes of the analysis, the study team assumes that the cuts would begin during the last quarter of FY 2017 (i.e. the summer of 2017) and continue for 24–27 months through September 2019 (i.e. the end of FY 2019), consistent with the 3-year rotation schedule with which the 4-25th currently operates.[14] Under this schedule, approximately one-third of the 4-25th rotates during the last quarter of each fiscal year—for purposes of this analysis the study team makes the assumption that all outbound PCS occur from July–August, and that from August–September of that same year, they are replaced by a smaller number of inbound soldiers equal to one-third of the "new" reduced TOE.

Assuming the current TOE calls for 3,590 soldiers and the new reduced TOE calls for 960 soldiers (i.e. a cut of 2,630 soldiers), a total of 1,197 soldiers would leave the 4-25th in July and August of 2017, and in August and September only 321 soldiers would move into the 4-25th. As of September 2017, the ASL of the 4-25th would be 2,714 soldiers, and it would continue at that level through June 2018. In July and August 2018 a new set of outbound PCS would begin, followed by the next wave of inbound PCS. The full transition with a reduction of 2630 soldiers as assumed for purposes of this analysis is summarized in Table 7. Table 8 shows the assumed transition to the "Validated" ATF with a TOE of 1,597 soldiers. Figure 3 provides a graphical representation of the phased-in reduction assumed in this analysis.

[14] This time frame (in terms of months) is specifically consistent with the original announcement of the force reduction which was announced in July 2015 and which was to have been completed by the end of FY 2017.

Table 7. Assumed Transition from a TOE of 3,590 to a Reduced TOE of 960

Year	ASL in June	Soldiers Outbound in July/August	Soldiers Inbound in August/September	ASL at the end of the FY
2016	3,590	1,197	1,197	3,590
2017	3,590	1,197	320	2,714
2018	2,714	1,197	320	1,837
2019	1,837	1,197	320	960
2020	960	320	320	960
2021	960	320	320	960

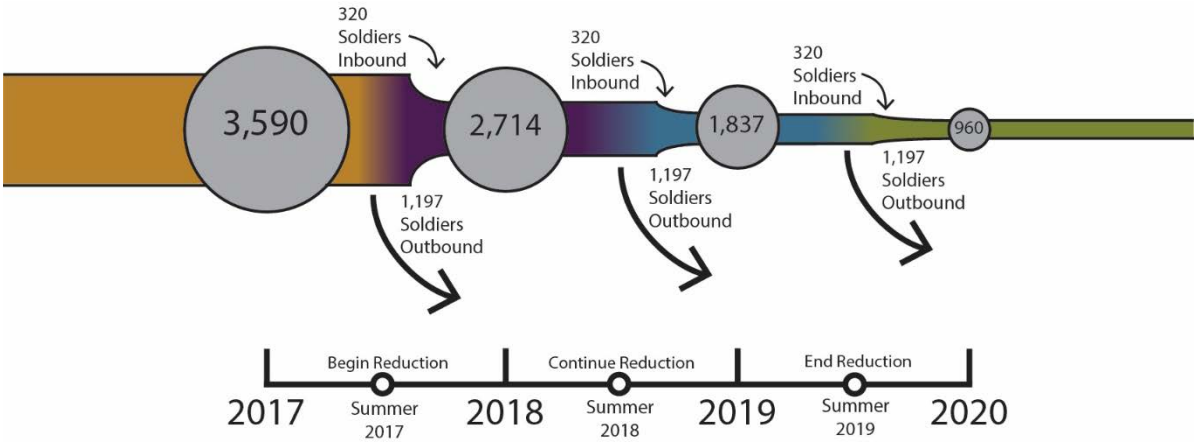
Source: Developed by Northern Economics.

Table 8. Assumed Transition from a TOE of 3,590 to a Reduced TOE of 1,597

Year	ASL in June	Soldiers Outbound in July/August	Soldiers Inbound in August/September	ASL at the end of the FY
2016	3,590	1,197	533	2,926
2017	3,590	1,197	533	2,926
2018	2,926	1,197	533	2,262
2019	2,262	1,197	533	1,597
2020	1,597	533	533	1,597
2021	1,597	533	533	1,597

Source: Developed by Northern Economics.

Figure 3. Graphical Representation of the Phased Reduction from 3,590 Soldiers to 960 Soldiers



2.1.2.2 Residence Locations of the 4-25th and their Families

One of the critical elements of the analysis is the estimation of the number of soldiers from JBER and from the 4-25th that live off-base within the MOA, and that live off base in the MSB. As discussed in Section 2.1.1.1 on page 16, USARAK was able provide counts of soldiers living on-base, but could not provide estimates of soldiers living off-base within the MOA, or estimates of soldiers living in the MSB.

After examining several potential methodologies for estimating the off-base split of soldiers between the MOA and the MSB, the study team gained access to actual PFD Applications from 2008–2016. Through a series of filters of PFD Applications, the study team arrived at a final estimate of the off-base split:

- 81.2 percent of off-base JBER soldiers are assumed to live in the MOA
- 18.8 percent of off-base JBER soldiers are assumed to live in the MSB.

Table 9 summarizes estimates and assumptions regarding residential arrangements of soldiers under current conditions and with the two reduction options. Five types of arrangements are documented:

1) **Unaccompanied Soldiers Living On-base**: These soldiers live in the "barracks". Estimates under the May 2016 ASL were provided by USARAK (2016).
2) **Unaccompanied soldiers living off-base at MOA**: USARAK provided an estimated count under the May 2016 ASL (USARAK, 2016). The study team has made the assumption that all unaccompanied soldiers that live off base choose to live in the MOA.
3) **Unaccompanied Soldiers Living On-base**: These soldiers live in privatized family housing. Estimates under the May 2016 ASL were provided by USARAK (2016).
4) **Accompanied Soldiers Living Off-base in the MOA**: USARAK could only estimate the total off-base count. The split was estimated by the study team using PFD Applications.
5) **Accompanied Soldiers Living Off-base in the MSB**: The split between MOA and MSB was estimated by the study team using PFD Applications.

Table 9. Residential Arrangements of Soldiers in the 4-25th

	Current Conditions		With Reduction Options	
Residence Location	3,590 TOE	May 2016 ASL	Validated ATF	Reduce by 2,630
Unaccompanied Soldiers Living On-Base	1,661	1,550	740	445
Unaccompanied Soldiers Living Off-Base in MOA	53	50	23	13
Accompanied Soldiers Living On-Base	1,178	1,100	523	314
Accompanied Soldiers Living Off-base in the MOA	567	528	253	153
Accompanied Soldiers Living Off-base in the MSB	131	122	58	35
Total Soldiers	3,590	3,350	1,597	960

Source: Developed using NEI assumptions using PFD Application data (ADOR, 2016) and on-base housing estimates from USARAK (2016).

2.1.2.3 Dependents of the 4-25th

As indicated in the previous section, estimates of the number and ages of dependents associated with the 4-25th were provided to the study team based on the ASL as of May 2016. The fact that these "data" are estimates rather than hard numbers was also noted. The study team makes the assumption that overall dependent population increases or decreases in exact proportion to changes in strength levels.

Table 10. Soldiers in the 4-25th and Dependents under the Current TOE and ASL, and under Reduction Options

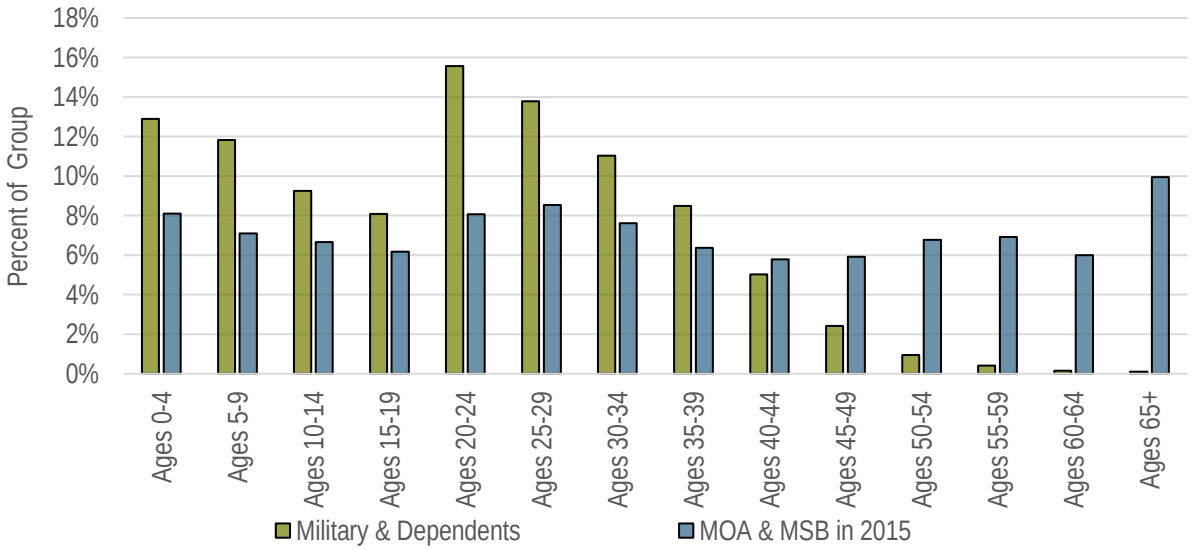
	Under Current Conditions		With Reduction Options	
	3,590 TOE	3,351 ASL	Validated ATF	Reduce by 2,630
4-25th Soldiers	3590	3,350	1,597	960
Dependents associated with the 4-25th	4,420	4,125	1,966	1,182
Total Military and Dependents	8,010	7,475	3,563	2,142

Source: Developed by Northern Economics based on estimates from USARAK (2016).

One of the key differences between the military population and their dependents is that because the military generally includes only persons aged 18–64, it is a much younger population in general than the overall population in the MOA and the MSB. This is demonstrated in Figure 4 which breaks the military population in MOA and MSB by 5-year age group as a percent of the total military population. A second key difference in terms of age is the fact that longevity in the military is quite limited. Over 40 percent of the military population are young adults from 20–39 years of age, while in the general population this same group comprises only 24 percent of the total.

Another key feature of the military and dependent population is that because of the regular rotation schedule, the military population appears not to age—each year soldiers and their families that have lived in town for three years are replaced by soldiers and families that are the same age they were three years ago.

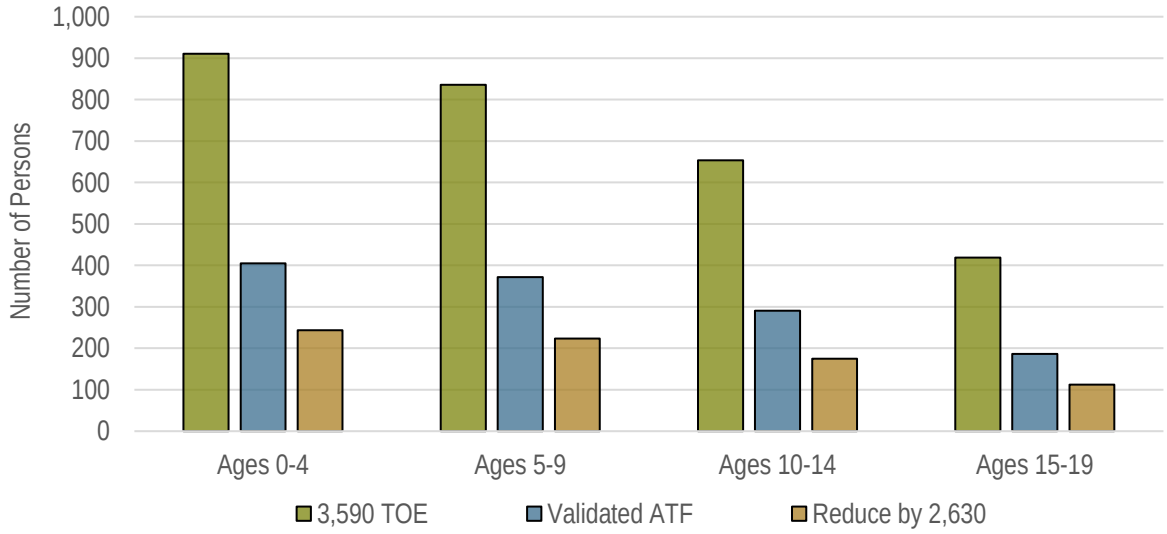
Figure 4. Comparison of Military and Dependent to MOA and MSB Populations to by Age Group



Source: Developed by Northern Economics using data from the Alaska REMI Model.

Figure 5 shows the estimated numbers of children and young adults less than 20 years of age in the dependent population under three different strength levels for the 4-25th: 1) the current TOE of 3,590 soldiers, 2) Under the "Validated" ATF with 1,597 soldiers, and 3) Under the full reduction to 960 soldiers.

Figure 5. Dependent Population Aged 0–19 by 5-year Cohort Groups under Three Strength Levels



Source: Developed by NEI using data from USARAK (Te 2016) and the Alaska REMI Model.

Estimates of the Number School Children Attend ASD and MSBSD Schools

The process used by the study team to derive estimates of the number of children attending schools in the MOA and in the MSB was relatively complex and therefore the discussion has been relegated to Appendix on page 142 of the report. USARAK data indicate there were approximately 2,600 children ages 0–18 associated with the 4-25th at the ASL in May 2016. The study team estimates that of these, 1,558 are of school age. By combining data from ASD and from USARAK, the study team estimates that based on the May 2016 ASL, there are a total of 1,152 ASD students associated with the 4-25th and another 406 attending schools in the MSB.

Table 11. ASD and MSBSD Students Associated with the 4-25th

	Current Conditions		With Reduction Options	
School District	3,590 TOE	3,351 ASL	Validated ATF	Reduce by 2,630
4-25th Students Attending School in the MOA	1,235	1,152	549	330
4-25th Students Attending School in the MSB	435	406	193	116
All School Attendees Associated with the 4-25th	1,670	1,558	743	447

Residential Arrangements of Soldiers and Dependents of the 4-25th

Table 12 shows the study team's assumed distribution of soldiers and their dependents across five types of living arrangements under current conditions and with the two reduction options. In general, the same set of living arrangement assumptions used for soldiers were applied to dependents with one major exception—the estimated counts of school children attending schools in the MOA and MSB as described above take precedent over the MOA/MSB split derived from PFD applications.

Table 12. Residential Arrangements of Soldiers and Dependents of the 4-25th

	Current Conditions		With Reduction Options	
Residence Location	3,590 TOE	3,351 ASL	Validated ATF	Reduce by 2,630
Unaccompanied Soldiers Living On-Base	1,661	1,550	740	445
Unaccompanied Soldiers Living Off-Base in MOA	53	50	23	13
Soldiers and Dependents Living On-Base	3,954	3,694	1,757	1,054
Soldiers and Dependents Living Off-Base in the MOA	1,472	1,368	656	397
Soldiers and Dependents Living Off-Base in the MSB	870	813	387	233
Total Count of Soldiers and Dependents	8,010	7,475	3,563	2,142

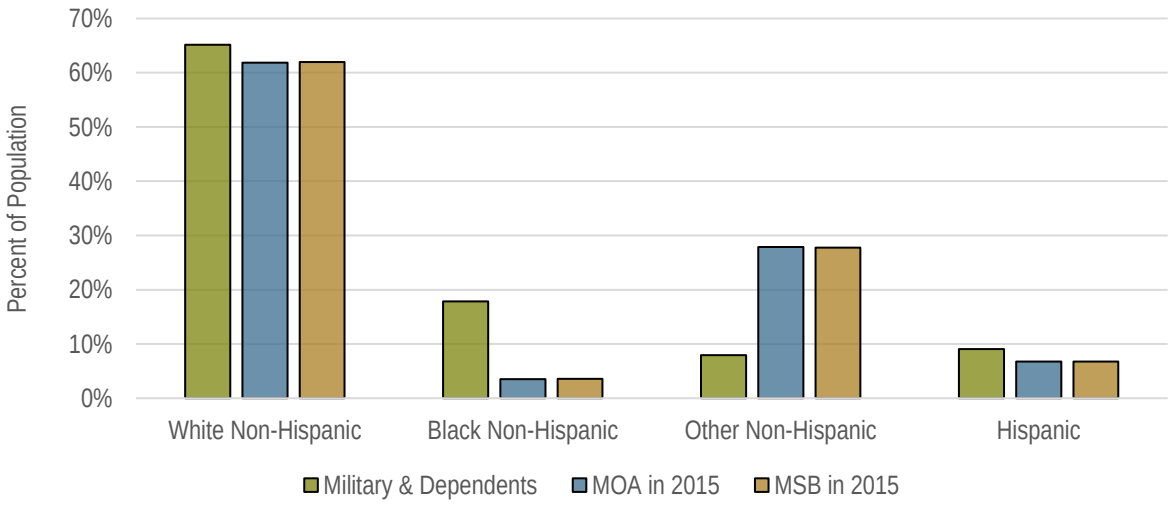
Source: Developed using NEI assumptions using PFD Application data (ADOR, 2016) and on-base housing estimates from USARAK (2016).

2.1.2.4 Assumed Racial and Ethnic Characteristics of the 4-25th and Its Families

Information on the racial and ethnic characteristics of the 4-25th was not requested by the study team, although there were indications in key informant interviews that in general the military and its dependents have a noticeably different racial and ethnic mix than the baseline population of the MOA and MSB in general. The Alaska REMI Model does include information on race and ethnicity for military populations and their dependents and this information is summarized here. Because of the differences between military populations and non-military populations in the MOA and MSB, the proposed force reduction is likely to have a measurable impact on the region's racial and ethnic mix.

Figure 6 summarizes the racial/ethnic mix in military populations with their dependents and compares them to the mix in the MOA and MSB in 2015. The military population is 65 percent White non-Hispanic, 18 percent Black non-Hispanic, 8 percent Other non-Hispanic and 9 percent Hispanic. In the MOA, 62 percent are White non-Hispanic, 4 percent are Black non-Hispanic, 28 percent Other non-Hispanic and 7 percent Hispanic.

Figure 6. Race/Ethnic Mix in Military Population Compared to Populations in the MOA and MSB



2.2 Existing Conditions

This section provides an overview of the demographic, economic, and housing conditions in the MOA and the MSB that are likely to be affected by the force reduction at JBER. Socioeconomic data presented here were obtained from the Alaska REMI Model developed by Regional Economic Models, Inc. for, and with the collaboration of, Northern Economics, Inc. A key foundation of the REMI model is an aggregation of historic data from a variety of state and federal agencies, including the U.S. Census Bureau, U.S. Bureau of Labor Statistics, ADOLWD, and others.

Section 2.2.1 provides a summary of the historic and existing socioeconomic conditions in the MOA. This is followed by a similar section (Section 2.2.2) for the MSB. Both of these sections will describe the population in terms of overall size, age, and racial and ethnic diversity. The sections will also describe the labor force, as well as employment, wages and salaries, and personal consumption. Finally, the sections will provide historic and current indicators regarding housing stocks and housing prices.

2.2.1 Municipality of Anchorage

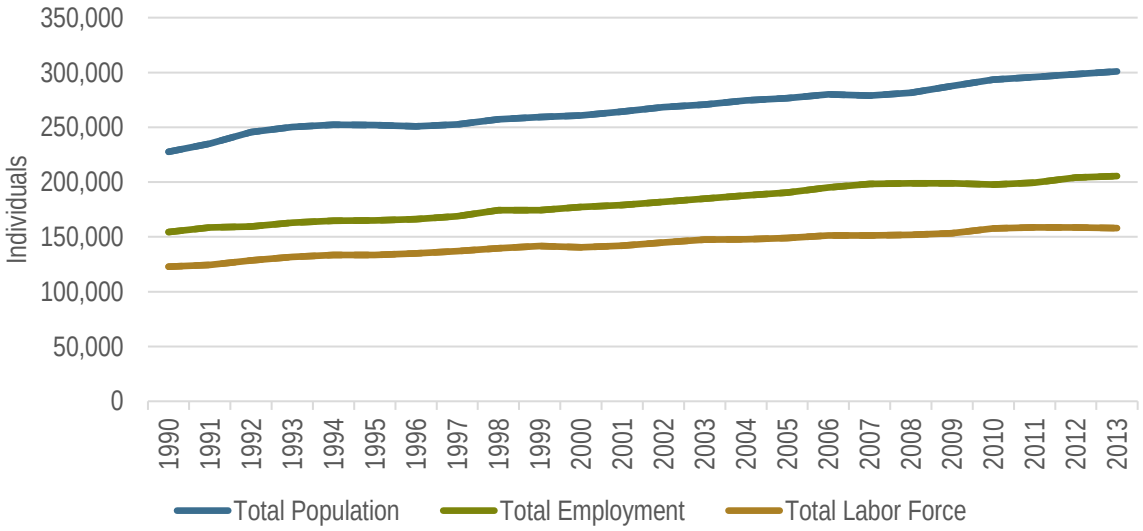
The MOA is located between the two northern arms of the Cook Inlet and is considered the primary urban center of the state. Anchorage, a Unified Home Rule Municipality, also encompasses the nearby communities of Girdwood and Eagle River, which are located on the Turnagain Arm and the southern shore of the Knik Arm, respectively. Anchorage is connected to the Alaska state highway and railway systems, and thus is accessible by road and rail as well as by air and water (Himes-Cornell et al. 2013).

Anchorage is located in what traditionally was an Athabascan area, as coastal Athabascans once lived along the shores of the Cook Inlet. Anchorage began as a staging area for gold miners in 1887 and in 1922. The community was incorporated as a city in 1920 and experienced an increase in development during World War II and the Cold War due to its strategic position to Japan and the Soviet Union, respectively. A massive earthquake damaged much of Anchorage in 1964, but the city was ultimately rebuilt and grew as a result of development associated with the oil and gas industry (Himes-Cornell et al. 2013).

2.2.1.1 Population, Employment, and Labor Force

Figure 7 provides an overview of the population, employment, and labor force changes from 1990 to 2013. The total population of the MOA in 2013 was nearly 301,000 individuals. The total population in 1990 was nearly 228,000 and increased through 1994 to a total of just over 252,000 before declining slightly to approximately 251,000 in 1996. From 1997 to 2006 and from 2008 to 2013, however, the total population increased annually. Total employment in the MOA in 2013 was over 205,000, growing from a total of around 154,000 in 1990. The total labor force in the MOA was approximately 158,000 in 2013, up from nearly 123,000 in 1990.[15]

Figure 7. Anchorage Population, Employment, and Labor Force, 1990-2013



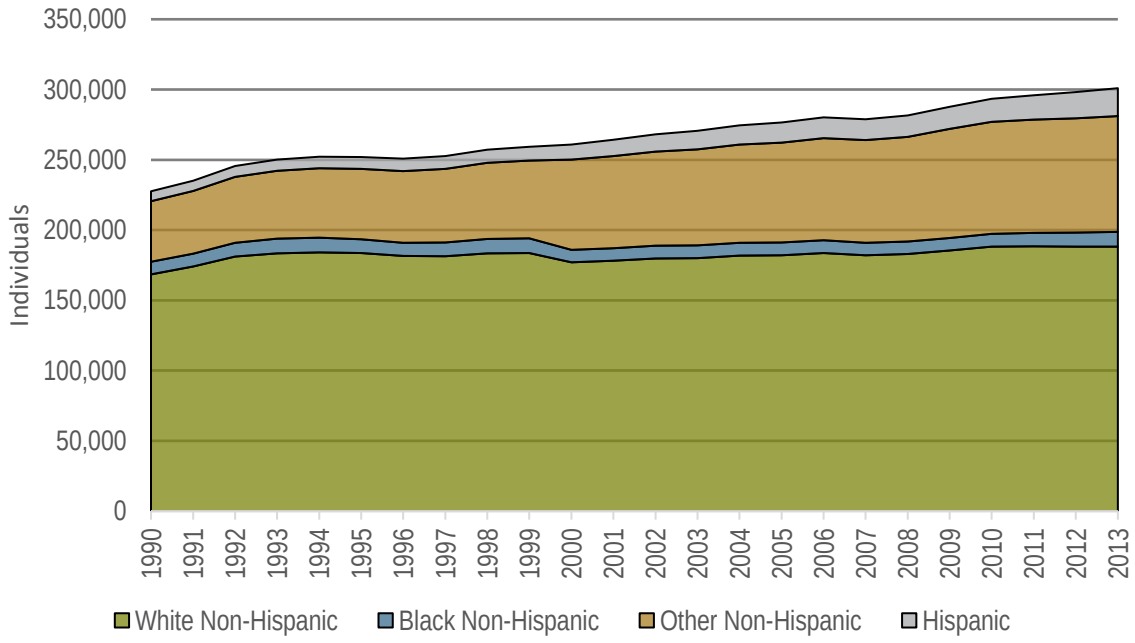
Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

[15] Total employment exceeds the total labor force in the MOA because employment statistics are tabulated at the place of work and labor force statistics are tabulated at the place of residence. Since the MOA is the major employment center in the region, residents from outside the MOA are employed in the MOA. Furthermore, those in the military are not considered part of the labor force but are considered employed.

2.2.1.2 Race and Ethnicity

Figure 8 shows the total population of the MOA, divided into major racial/ethnic categories, from 1990 to 2013. The categories include White non-Hispanics, African-American/Black non-Hispanics, "Other" non-Hispanics (which includes Asian, Alaska Native/American Indian, and Native Hawaiian/Other Pacific Islander non-Hispanics), and Hispanic/Latino (who can be of any race). Since 1990, the number of White non-Hispanics has increased from over 168,000 to over 188,000 in 2013; the relative percentage of White non-Hispanics has decreased from a high of 74.0 percent in 1990 to a low of 62.5 percent in 2013. Since 1990, the overall numbers of African-American/Black non-Hispanics in the MOA have fluctuated from about 9,000 to about 11,000. The racial/ethnic groups with the largest growth are those classified as Other non-Hispanics, which totaled approximately 43,000 in 1990 and increased to over 82,000 in 2013. The overall number of Hispanics also increased from an approximate total of 7,000 in 1990 to nearly 20,000 in 2013.

Figure 8. Anchorage Population, by Race/Ethnicity, 1990–2013

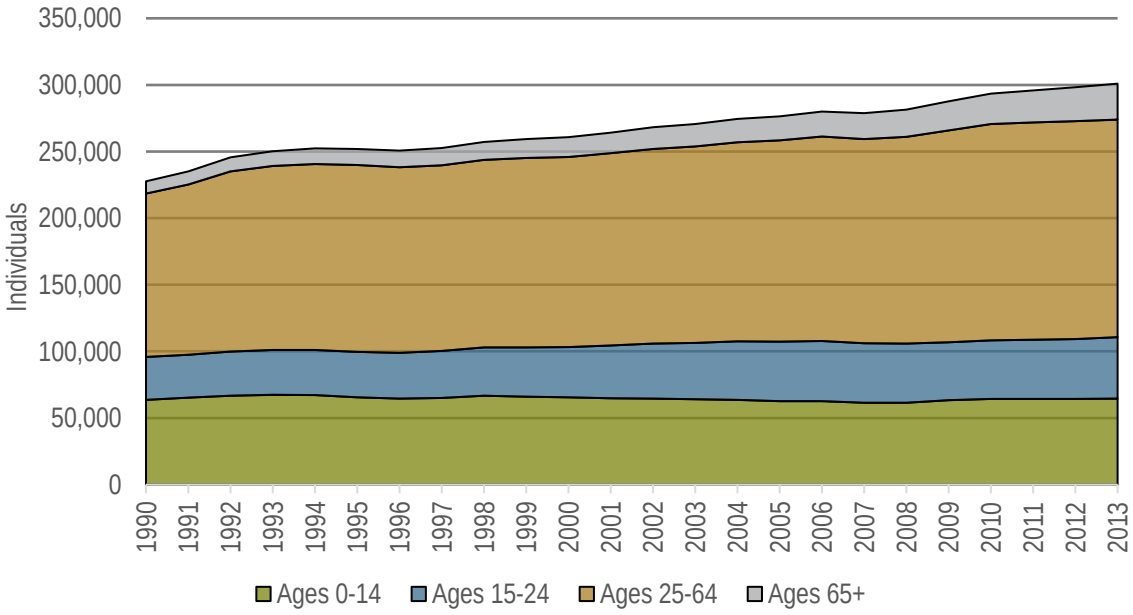


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.1.3 Age Characteristics

Figure 9 shows the total population of the MOA, divided into major age categories, from 1990 to 2013. The total number of people aged 25–64 has increased from a total of nearly 123,000 in 1990 to approximately 163,000 in 2013. From 1990 to 2013, this age cohort represented approximately 53.8 to 55.6 percent of the total population. The next-largest age cohort was those aged 0–14, which totaled nearly 64,000 in 1990 and increased to over 67,000 in 1993 before declining to approximately 61,000 in 2007; by 2013 the total number of people aged 0–14 was approximately 65,000. The number of people aged 65 and over has increased steadily since 1990, from a total of under 9,200 to a total of approximately 27,000 in 2013.

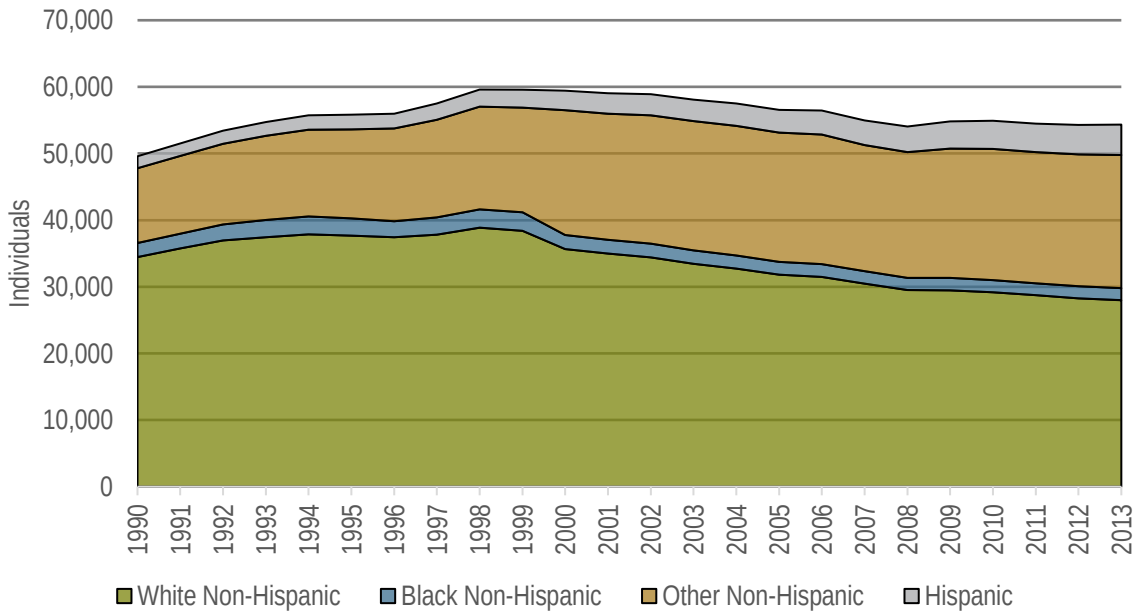
Figure 9. Anchorage Population, by Major Age Categories, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 10 shows the population of school aged children (5 to 17) in the MOA, divided into major racial/ethnic categories, from 1990 to 2013. The total population of school aged children in 2013 was over 54,000. The population of school aged children in 1990 was almost 50,000 and increased to a total of nearly 60,000 by 1998. Since then, the total number of school-aged children has decreased, reaching around 54,000 children in 2008. The number of White non-Hispanic school-aged children in 1990 was over 34,000. This number increased through 1998 to nearly 39,000 children before declining to approximately 28,000 in 2013. Since 1990, the overall number of African-American/Black non-Hispanics has fluctuated between a high of nearly 2,800 (in 1999) to a low of approximately 1,800 (2010). The racial/ethnic groups with the largest overall growth are those classified as Other non-Hispanics, which totaled over 11,000 in 1990 and increased to almost 20,000 by 2013. The overall number of Hispanics/Latinos also increased from an approximate total of 1,800 in 1990 to nearly 4,600 in 2013.

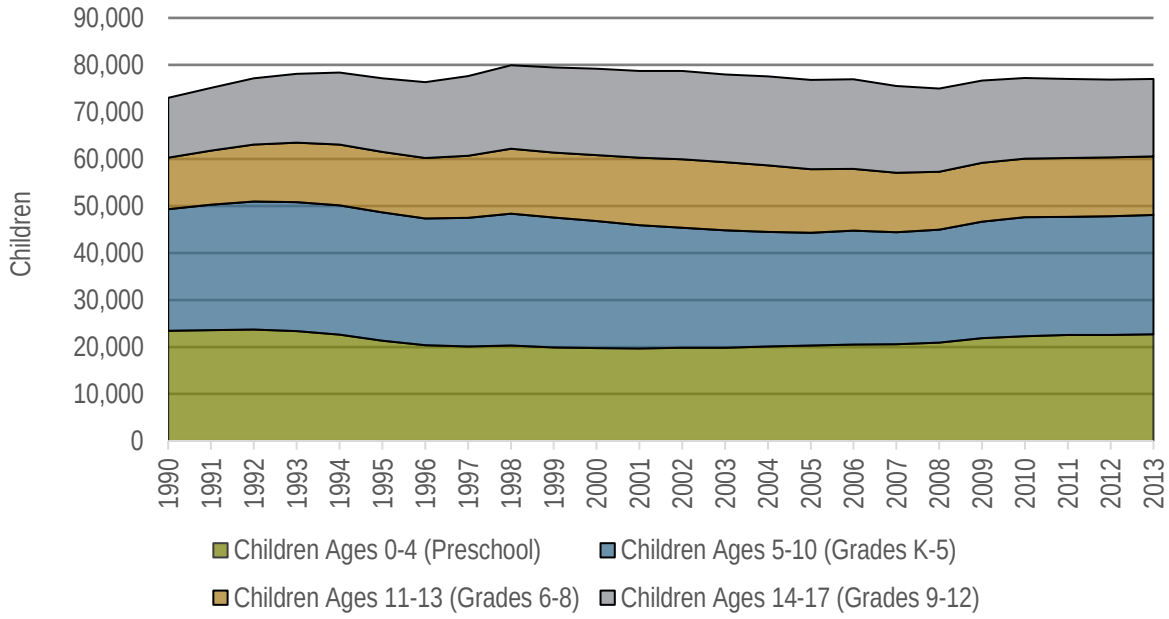
Figure 10. Anchorage School-Aged Children, by Race/Ethnicity, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 11 shows the total number of children in the MOA, ages 0-17, divided by schooling cohorts, from 1990 to 2013. In contrast to Figure 10, the totals in Figure 11 include those children aged 0-4 who may be in preschool. The total population of children in 2013 was over 77,000. The population of children in 1990 was over 73,000 and increased to a total of nearly 80,000 by 1998. Since then, the number of children in the MOA declined to a total of 75,000 in 2008 before rebounding slightly. The schooling cohort with the greatest number of students was Grades K-5, which had over 25,000 students in 2013. The schooling cohort with the fewest students was Grades 6-8, which had a total of over 12,000 individuals in 2013. The total number of children aged 14-17 was over 16,000 in 2013, while the number of preschool children was nearly 23,000 in 2013, representing approximately 29.4 of the total number of children in the MOA.

Figure 11. Anchorage Children, by School Cohort, 1990-2013

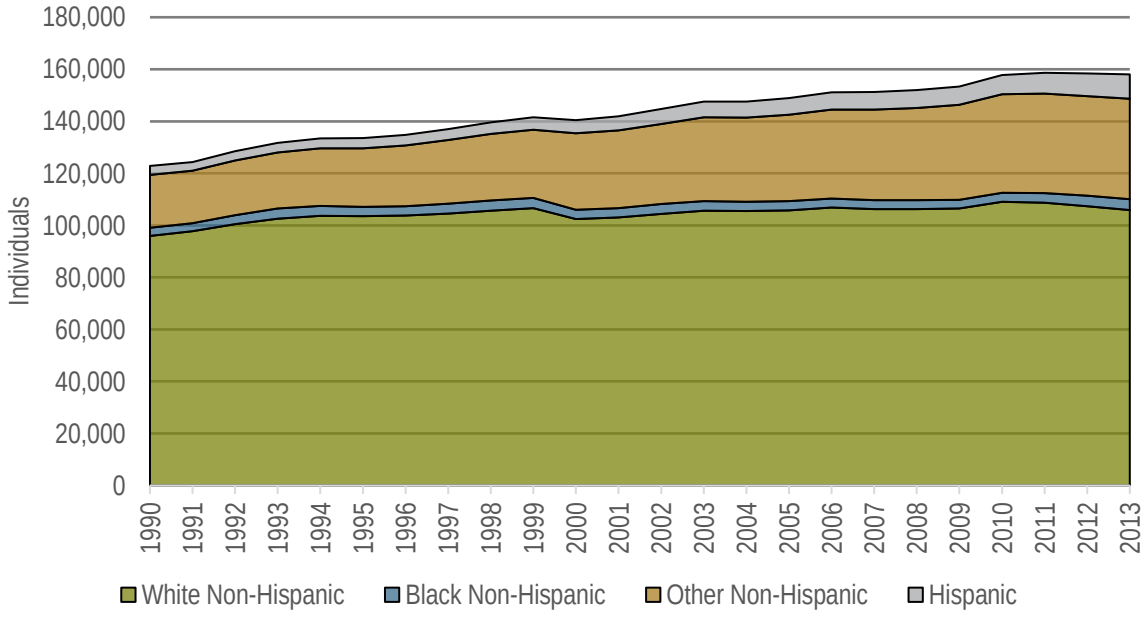


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.1.4 Labor Force

Figure 12 shows the labor force of the MOA, divided into major racial/ethnic categories, from 1990 to 2013. Labor Force is the population of residents aged 16 and older who are either employed or who are seeking employment (i.e. officially "unemployed"). Residents who are not able to work or who are not actively seeking employment are not considered part of the labor force. The total labor force of the MOA in 2013 was over 158,000. The total labor force in 1990 was nearly 123,000 and increased through 2011 to a total of nearly 159,000 before declining to its 2013 total. Since 1990, the number of White non-Hispanics in the labor force has increased from nearly 96,000 to nearly 106,000 in 2013, with a peak of over 109,000 individuals occurring in 2010. Since 1990, the overall numbers of African-American/Black non-Hispanics in the MOA labor force have fluctuated from 3,100 to over 4,200. The racial/ethnic groups with the largest overall labor force growth are those classified as Other non-Hispanics, which totaled over 20,000 in 1990 and increased to nearly 39,000 in 2013. The overall number of Hispanics/Latinos also increased from an approximate total of under 3,400 in 1990 to a labor force of over 9,400 in 2013, representing approximately 6.0 percent of the total labor force in that year.

Figure 12. Anchorage Labor Force, by Race/Ethnicity, 1990-2013

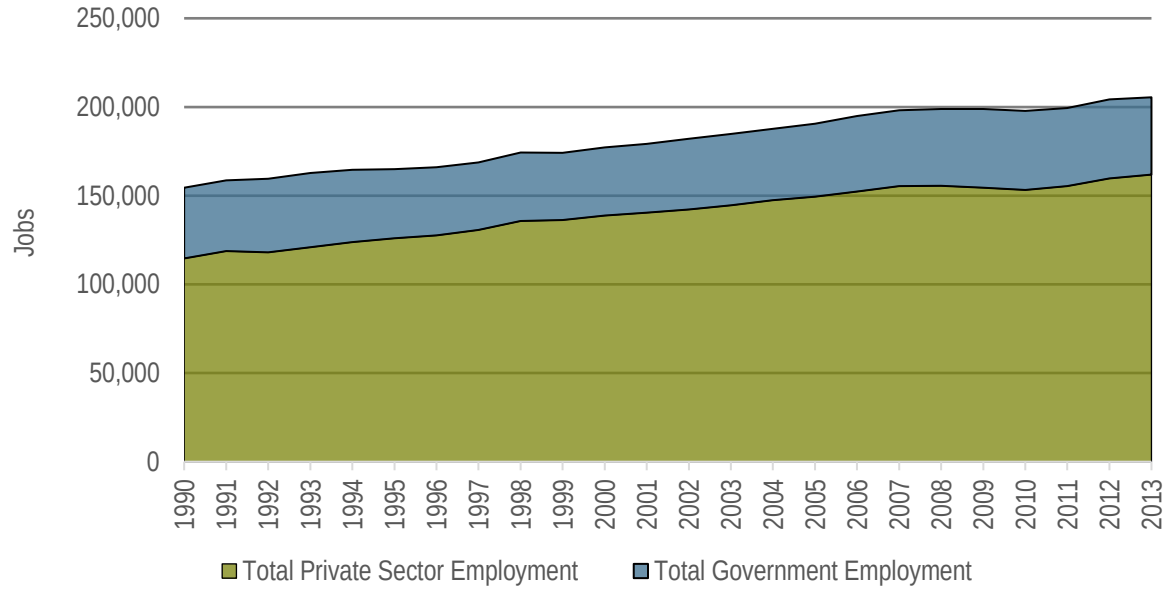


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.1.5 Employment

Figure 13 shows the total employment for the MOA, divided into private sector employment and government employment, from 1990 to 2013. The government employment total includes those employed at the local, state, and federal levels, including federal civilian employees and those serving in the military. Total employment for the MOA in 2013 was over 205,000. The total employment for the MOA increased steadily from 1990 to 2009, when it grew from over 154,000 to nearly 199,000. Total employment decreased slightly in 2010 before rebounding in 2011 and increasing again in 2012. In 2013, total private sector employment represented approximately 78.8 percent of all employment in the MOA, which was an increase from 74.2 percent in 1990.

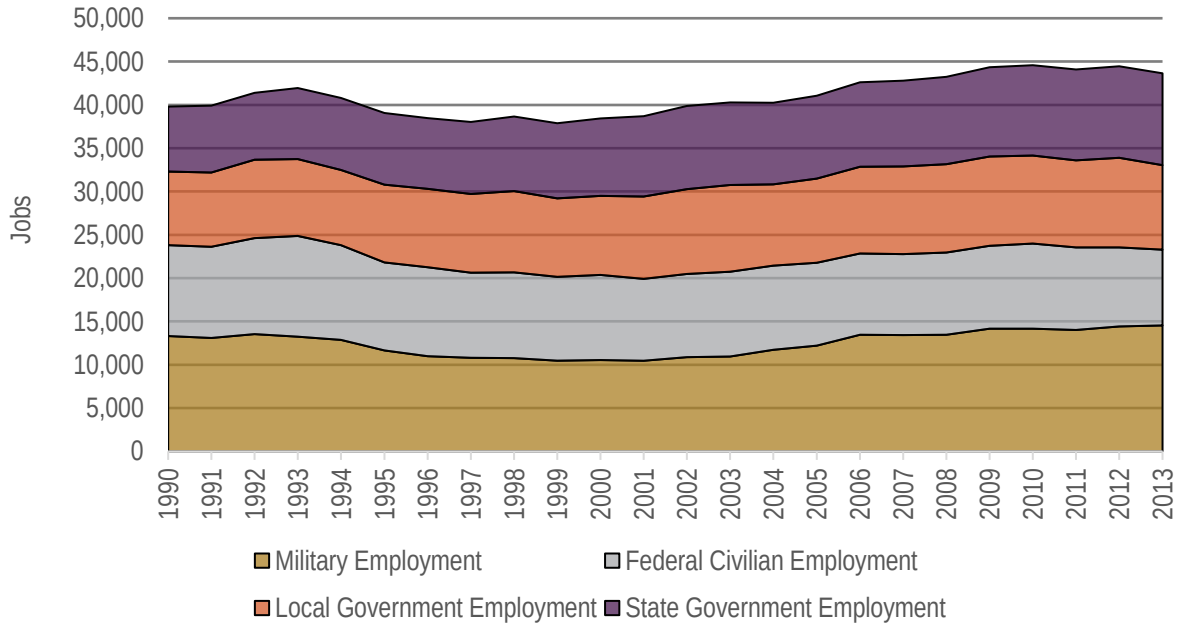
Figure 13. Anchorage Employment, by Private and Government Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 14 shows a more detailed breakdown of total government employment for the MOA from 1990 to 2013, divided into local, state, federal civilian, and federal military employment. Military employment figures include both full-time and part-time members of the U.S. military, including active duty soldiers, airmen, sailors, and marines, as well as members of the Reserve and National Guard.[16] The total government employment in 2013 was nearly 44,000. In 1990, the total government employment was almost 40,000. This total increased to nearly 42,000 in 1993 before declining to a low of under 38,000 in 1999. From 1999 to 2010, the total number of government employees generally increased. In 2011, the total number declined to around 44,000 and it remained near this total in 2012 and 2013. Military employment in 2013 was nearly 15,000. In 1990, military employment in the MOA was over 13,000 before decreasing to around 10,000 to 11,000 in the late 1990s. Since the early 2000s, however, military employment in the MOA has steadily increased. By 2013, military employment represented approximately 33.3 percent of all government employment in the MOA.

Figure 14. Anchorage Government Employment, by Major Sectors, 1990-2013



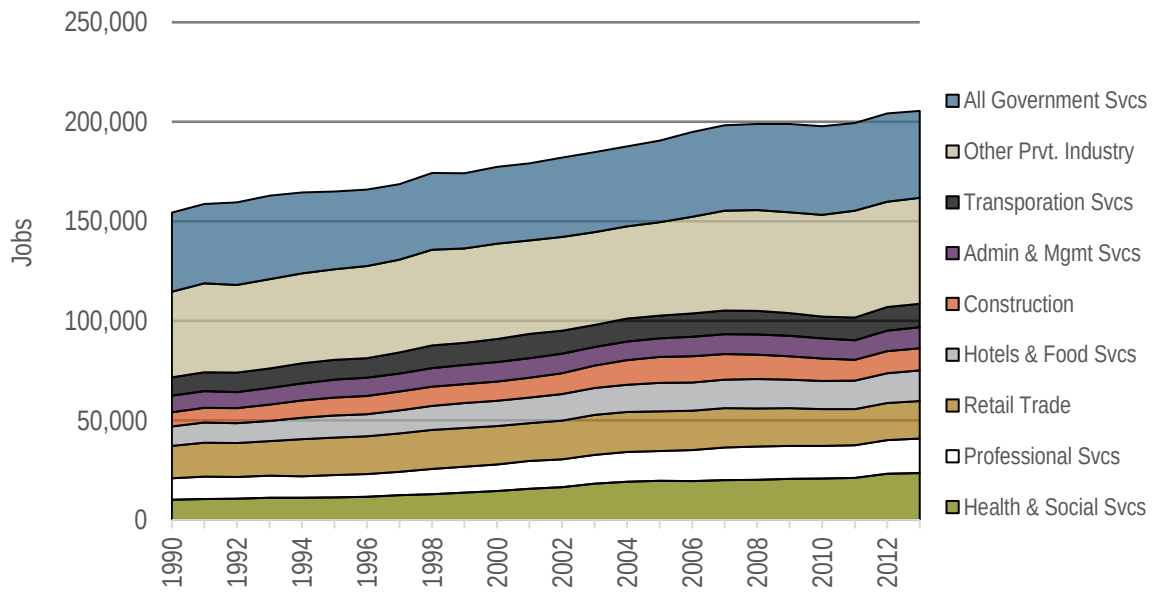
Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

[16] "Active duty" personnel are full-time members of the military who are not members of the Reserve or National Guard. A full-time member of the Reserve or National Guard is not considered to be on active duty.

2.2.1.6 Jobs by Sector

Figure 15 shows the total number of jobs in the MOA, divided into primary employment sectors, from 1990 to 2013. The figure includes health and social services, professional services, retail trade, hotel and food services, construction, administrative and management services, and transportation services. The figure also includes the total government jobs (also seen in Figure 13) and a category called "Other Private Industry" which includes those sectors with relatively few jobs compared to other primary sectors in the MOA, including real estate, finance, and wholesale trade, among others. The total number of jobs in 2013 was over 205,000. The total number of jobs in the MOA in 1990 was over 154,000, which increased to almost 199,000 by 2009. The total number of jobs decreased in 2010 before eventually increasing again in 2011-2013. Aside from government services, the single sector with the greatest number of jobs was health and social services, with nearly 24,000 jobs in 2013, up from over 10,000 in 1990. Retail trade had the second-largest number of jobs in 2013, with almost 19,000; however, the number of retail trade jobs was larger in the late 1990s and 2000s.

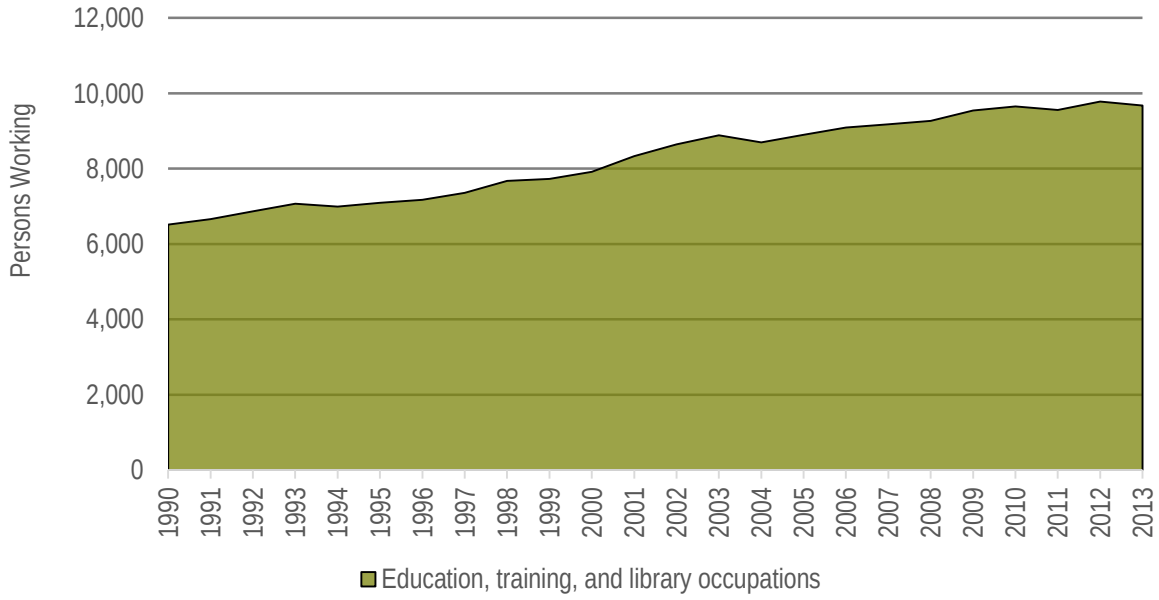
Figure 15. Anchorage Jobs, by Major Private Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 16 shows the total number of education, training, and library jobs in the MOA from 1990 to 2013. In 2013, the total number of education-related jobs was nearly 9,700, which represented an overall increase of approximately 3,100 jobs since 1990, when the total number of jobs was about 6,500. Generally, the number of education-related jobs increased from 1990 to 2003, with a small decline in 1994. In 2004, the total number of jobs declined by about 200 before increasing again in 2005–2010. Another small decline of 100 positions occurred in 2011 before another increase in jobs in 2012 to almost 9,800.

Figure 16. Anchorage Education-Related Jobs, 1990-2013

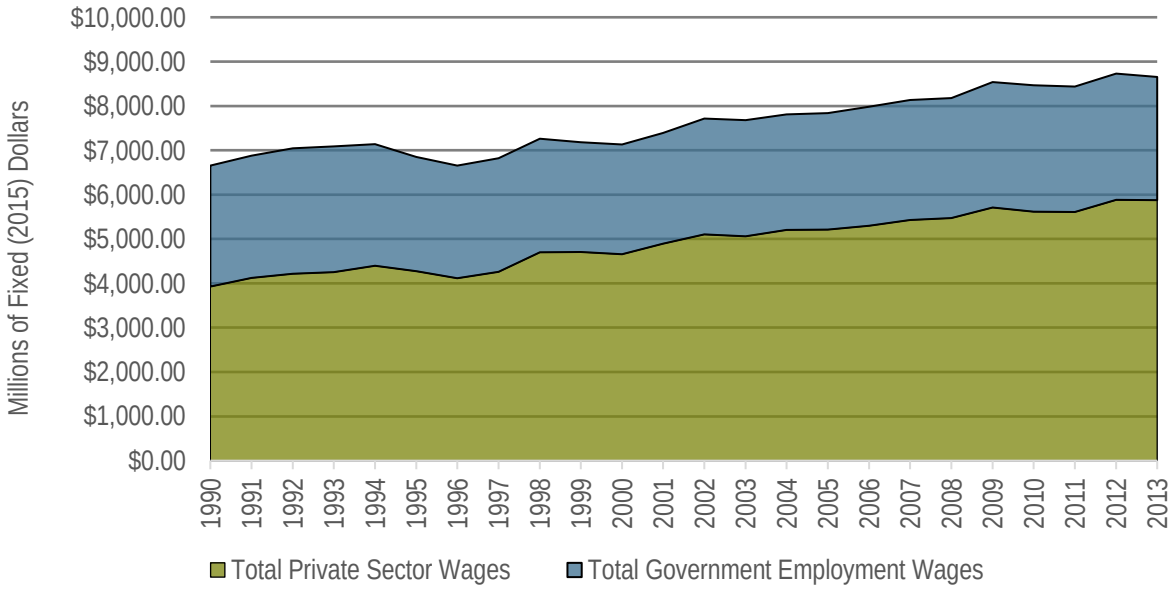


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.1.7 Income and Spending

Figure 17 shows the total wages for the MOA, divided into private sector employment and government employment, from 1990 to 2013. The government wages total includes those employed at the local, state, and federal levels of government, including federal civilian employees and those serving in the military. Total wages for the MOA in 2013 were nearly $8.7 billion. The total amount of wages for the MOA increased from 1990 to 1994, when it grew from around $6.7 billion to $7.1 billion. Wages decreased in 1995 and 1996 back to nearly the $6.7 billion mark before increasing to approximately $7.3 billion in 1998. From 2003 to 2009, wages steadily increased, from $7.7 billion to $8.5 billion. Total wages were generally stagnant in 2010 and 2011 before increasing again in 2012. Wages from private sector employment accounted for approximately 67.9 percent of all wages in the MOA in 2013. This proportion is higher than in the early 1990s when the percentage of private sector wages represented between 59.0 and 61.6 percent of the total wages in the MOA.

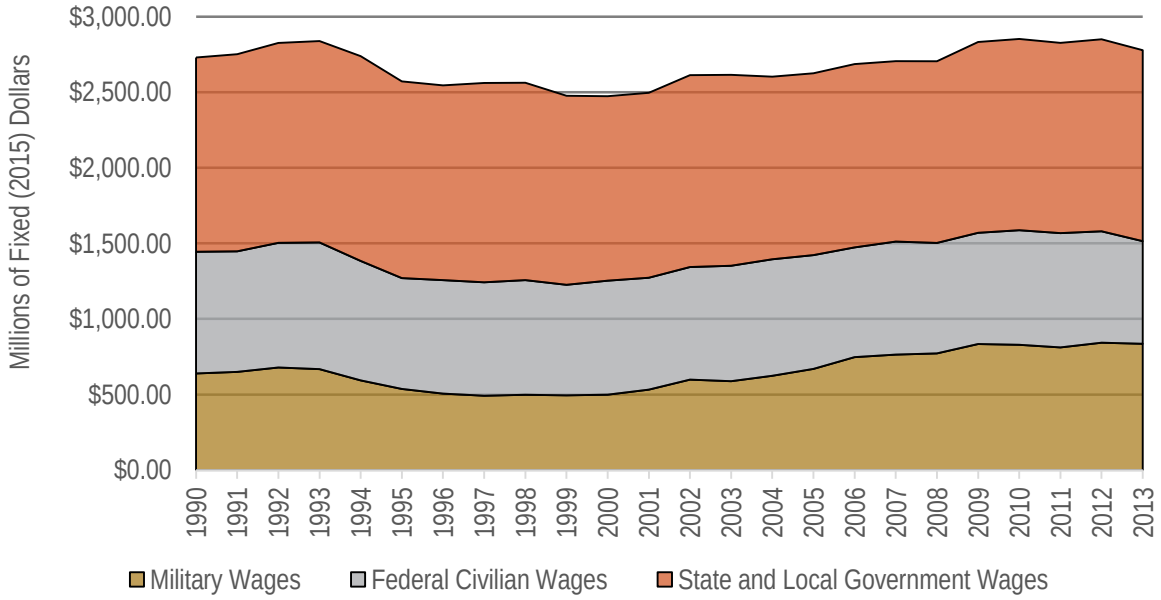
Figure 17. Anchorage Total Wages, by Private and Government Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 18 shows a more detailed breakdown of total government wages from the MOA from 1990 to 2013, divided into local and state government wages, federal civilian wages, and military wages. The total amount of wages from government employment was approximately $2.8 billion in 2013. Government wages in 1990 were over $2.7 billion before increasing to over $2.8 billion in 1993. From 1994 to 2000, government wages declined to a low of less than $2.5 billion. Government wages generally increased or stayed constant year-to-year from 2001 to 2012, ultimately reaching nearly $2.9 billion. Military wages show a similar variation over time, with total wages of nearly $840 million in 2013, representing 30.1 percent of all government wages that year.

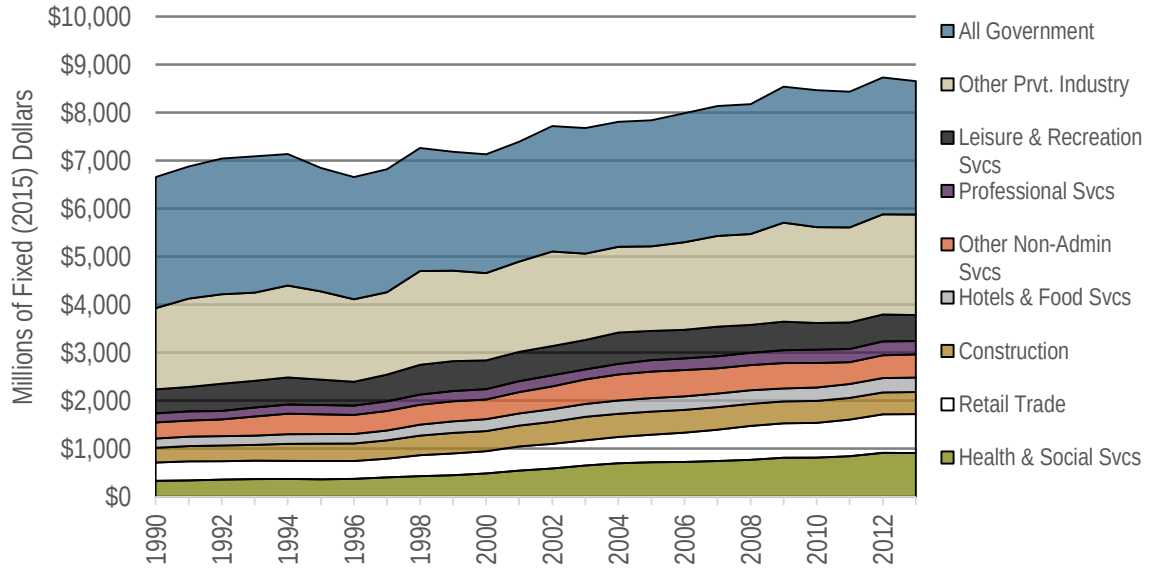
Figure 18. Anchorage Government Wages, by Major Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 19 shows the total wages in the MOA, divided into primary employment sectors, from 1990 to 2013. The total amount of wages in 2013 was nearly $8.7 billion in 2013. In 1990, the total wages were nearly $6.7 billion and increased to approximately $7.1 billion through 1994 before declining to $6.7 billion in 1996. By 2003, total wages were over $7.8 billion and continued to increase through 2009, when total wages exceeded $8.5 billion. Aside from government services, the single sector with the highest total wages was health and social services, with over $910 million in 2013, up from $331 million in 1990. Retail trade had the second-highest total wage amount in 2013, with over $810 million. However, both health services and retail trade had lower wage totals in 1990 compared with leisure and recreation services, which had the highest wage total of any single sector at nearly $501 million.

Figure 19. Anchorage Private Sector Wages, by Major Sectors, 1990-2013



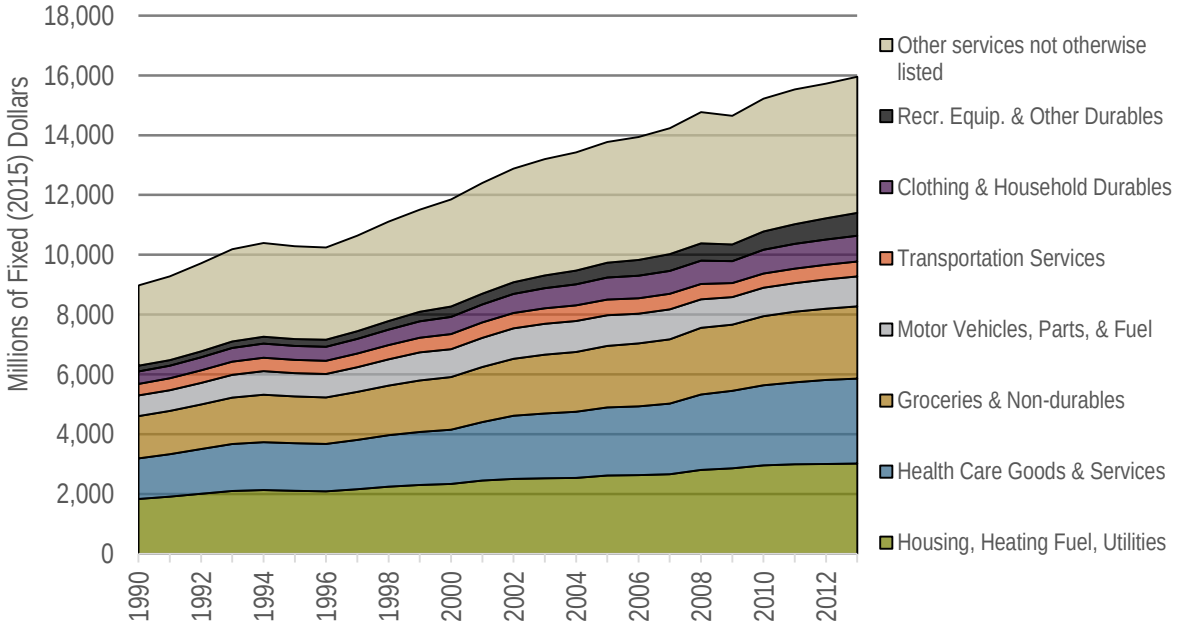
Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015)

Figure 20 shows the total amount spent on goods and services by households in the MOA, divided into primary categories, from 1990 to 2013. The figure includes dollar amounts spent on housing and utilities, health care, groceries, motor vehicles, transportation, clothing and household goods, recreational equipment, and other services. The total amount of money spent on goods and services was almost $16.0 billion in 2013. The total amount of money spent on goods and services in the MOA in 1990 was nearly $9.0 billion. This total generally increased or remained constant through 2008, which had a total of nearly $14.8 billion. Personal consumption declined slightly in 2009, to $14.6 billion, but increased from 2010 through 2013. The category with the largest amount of spending was leisure/recreation, which was almost $4.6 billion in 2013 and represented approximately 28.5 percent of all personal spending. The category with the second-largest amount of spending was housing and utilities, which was over $3.0 billion in 2013 and represented approximately 18.9 percent of all personal spending.

It is important to note here that by definition, personal consumption reflects the household spending patterns of residents by their place of residence, regardless of the location at which purchases are made. In all cases, spending by visitors and by businesses is not included. As an example, when a resident of the MSB buys groceries in Anchorage, it counts as personal consumption in the MSB. Similarly when a family from the MOA travels abroad, their spending counts as personal consumption in the MOA. If a

business in the MOA buys a vehicle paper from a dealer in the MSB, it does not count as personal consumption—not because the spending occurred in the MSB, but because it was a business that made the expenditure and spending by businesses is not included in personal consumption calculations.

Figure 20. Anchorage Personal Consumption Spending, by Major Categories, 1990-2013

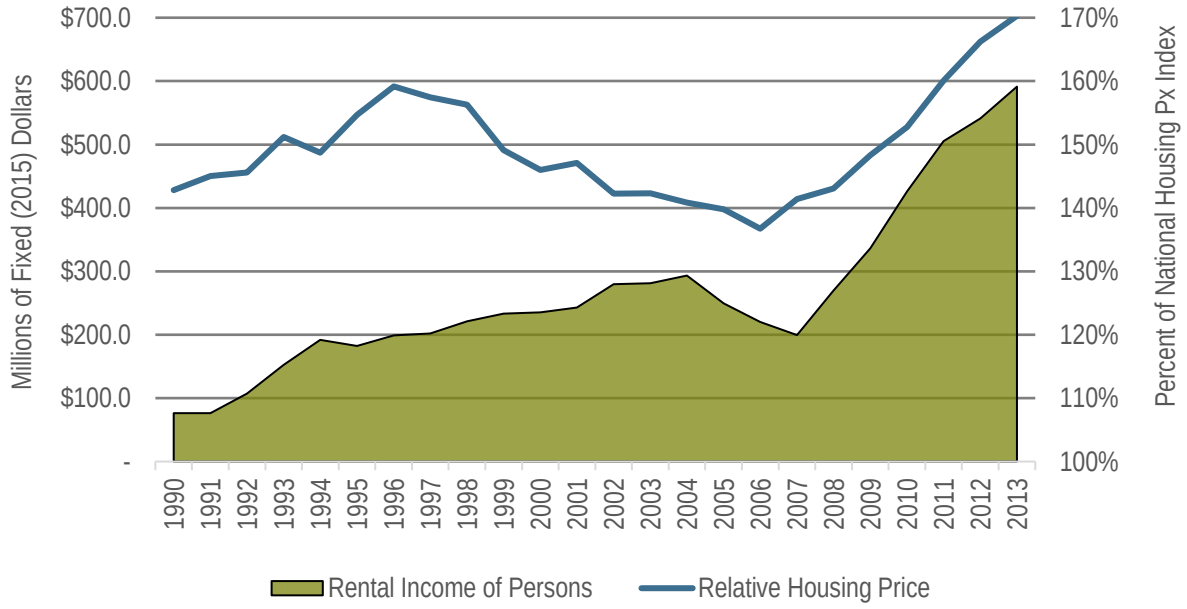


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015)

2.2.1.8 Housing

Figure 21 describes current housing condition in the MOA broken out into rental income and housing prices. Rental income of persons, in green, refers to net income of tenant-occupied housing or the collective net income of the landlords and can be viewed as the size of the rental market. Rental income steadily rose from 1990 – 2004 from just under $100 million to $300 million. After a short decline, rental income in Anchorage has again risen drastically since 2008 toping nearly $600 million in 2013. Relative housing price, in blue, refer the price of homes in Anchorage relative to the national average and have also followed a similar trend. In 1996, Alaska housing prices were 159 percent of the national averages, 137 percent in 2006 and 170 percent in 2013.

Figure 21. Anchorage Rental Income and Relative Housing Prices, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

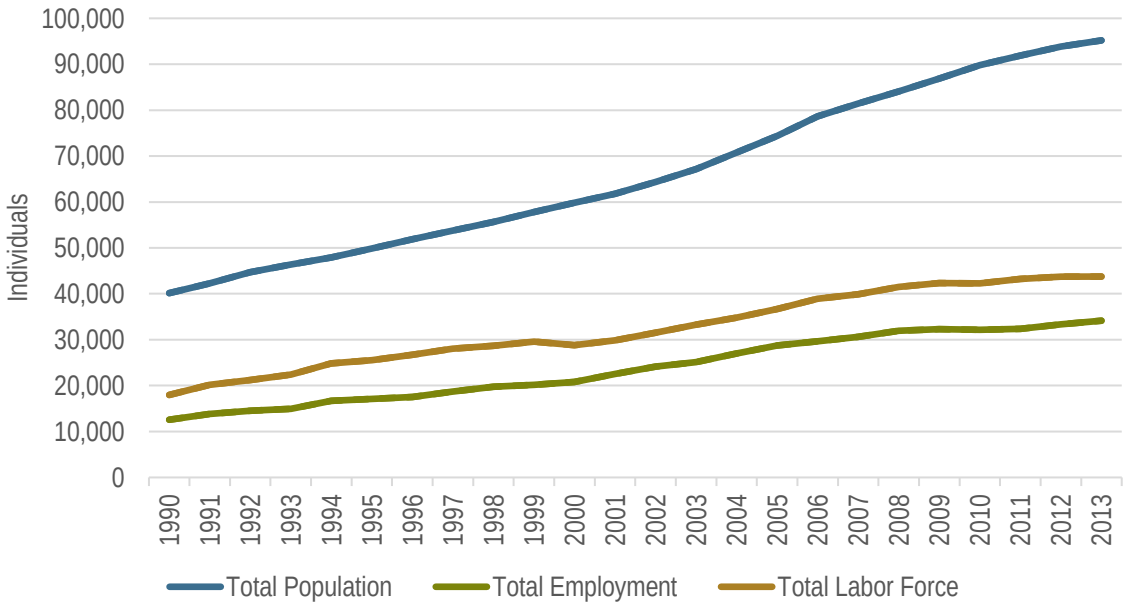
2.2.2 Matanuska Susitna Borough

The MSB is generally comprised of smaller communities, valley farmlands, and wilderness in the area north of the MOA. In terms of land-area, the MSB, which comprises 25,258 mi^2, is slightly larger than the State of West Virginia. Organized cities include Palmer, Wasilla, Houston, and Talkeetna. While Palmer in particular has ties to the agricultural industry, and other communities have also found economic opportunities in the tourism industry, the southern portions of the borough are within commuting distance to Anchorage while providing residents a much more rural lifestyle than is typically available in the MOA. Since 1990, the population of the MSB has grown at an average of nearly 3.7 percent per year. As population in the MOA increases, the communities in the MSB have experienced growth and are generally projected to experience substantial future growth.

2.2.2.1 Population, Employment, and Labor Force

Figure 22 provides an overview of the population, employment, and labor force changes from 1990 to. The total population of the MSB in 2013 was over 95,000 individuals. The total population in 1990 was approximately 40,000 and increased steadily through 2013. Total employment in the MSB in 2013 was over 34,000, growing from a total of almost 13,000 in 1990. The total labor force in the MSB was approximately 44,000 in 2013, up from around 18,000 in 1990.

Figure 22. MSB Population, Employment, and Labor Force, 1990-2013

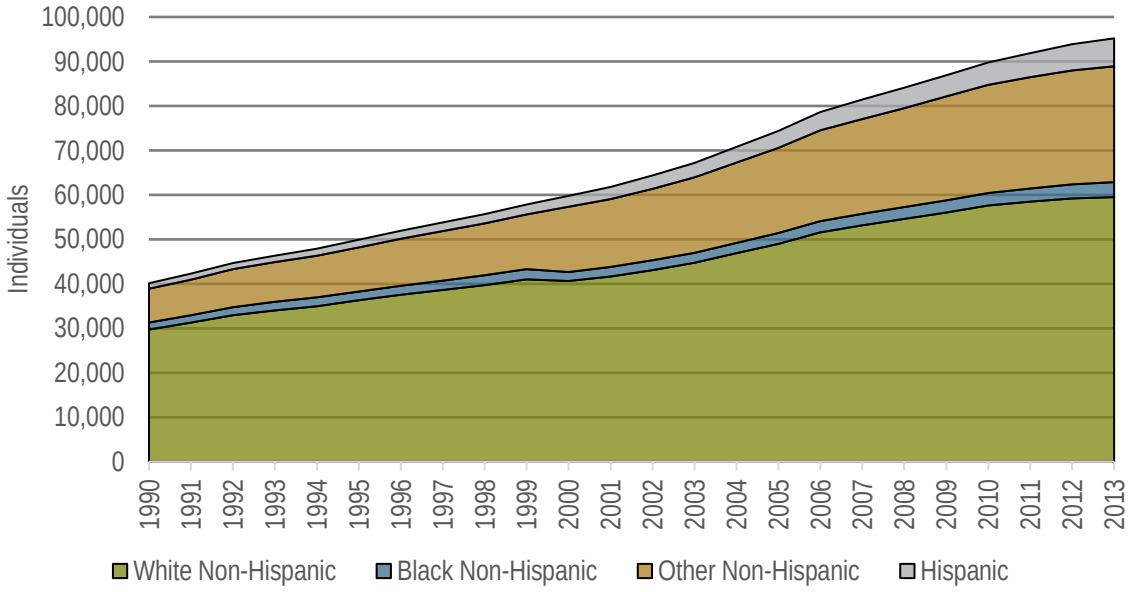


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.2 Race and Ethnicity

Figure 23 shows the total population of the MSB, divided into major racial/ethnic categories, from 1990 to 2013. Since 1990, the number of White non-Hispanics has increased from nearly 30,000 to nearly 60,000 in 2013; the relative percentage of White non-Hispanics has decreased from a high of 74.0 percent in 1990 and 1991 to a low of approximately 62.5 percent in 2013. Since 1990, the overall numbers of African-American/Black non-Hispanics in the MSB have fluctuated from about 1,600 to 3,400. The racial/ethnic groups with the largest relative growth are those classified as Other non-Hispanics, which totaled approximately 7,600 in 1990 and increased to over 26,000 in 2013. The overall number of Hispanics also increased from an approximate total of 1,300 in 1990 to nearly 6,300 in 2013.

Figure 23. MSB Population, by Race/Ethnicity, 1990-2013

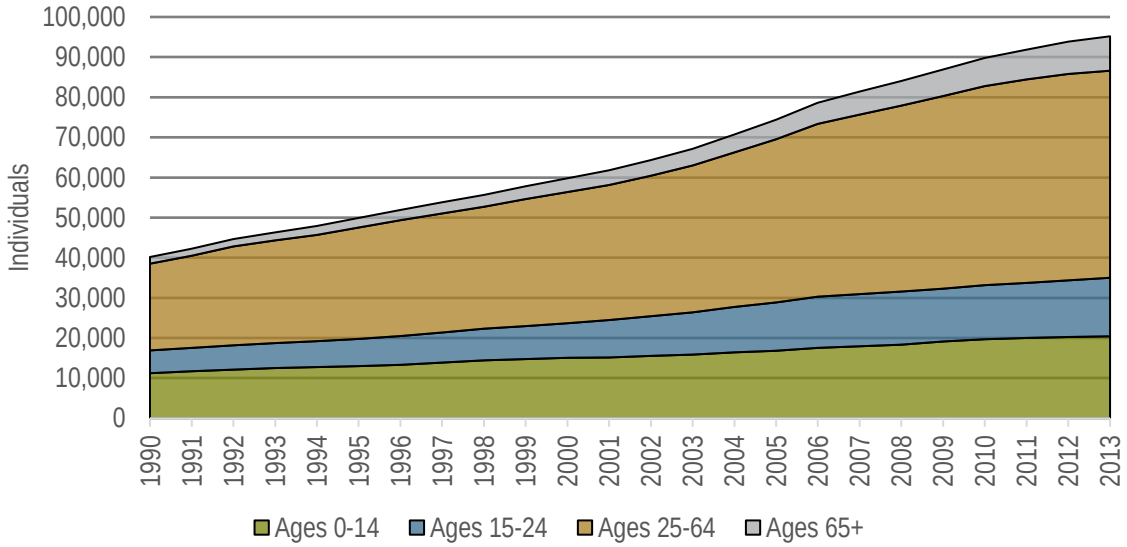


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.3 Age Characteristics

Figure 24 shows the total population of the MSB, divided into major age categories, from 1990 to 2013. The total number of people aged 25–64 has increased from a total of almost 22,000 in 1990 to approximately 52,000 in 2013. From 1990 to 2013, this age cohort represented approximately 53.8 to 55.6 percent of the total population. The next-largest age cohort was those aged 0 to 14, which totaled over 11,000 in 1990 and increased to over 20,000 by 2013. The number of people aged 65 and over has increased steadily since 1990, from a total of 1,600 to a total of approximately 8,600 in 2013.

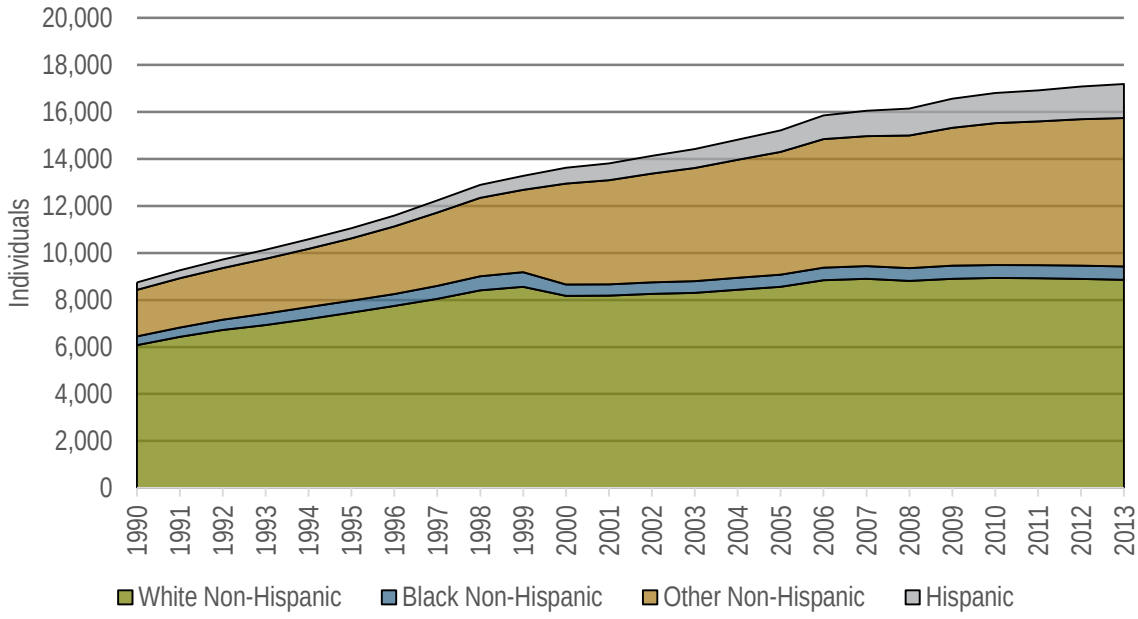
Figure 24. MSB Population, by Major Age Categories, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 25 shows the population of school aged children (5 to 17) in the MSB, divided into major racial/ethnic categories, from 1990 to 2013. The total population of school aged children in 2013 was over 17,000. The population of school aged children in 1990 was over 8,700 and it has increased annually through 2013. The number of White non-Hispanic school aged children in 1990 was over 6,000 in 1990 and increased to approximately 8,900 individuals by 2013. Since 1990, the overall numbers of African-American/Black non-Hispanics has fluctuated between around 400 and 600 individuals. The racial/ethnic groups with largest overall growth are those classified as Other non-Hispanics, which totaled nearly 2,000 in 1990 and increased to over 6,300 by 2013.The overall number of Hispanics/Latinos also increased from an approximate total of over 300 in 1990 to approximately 1,400 in 2013.

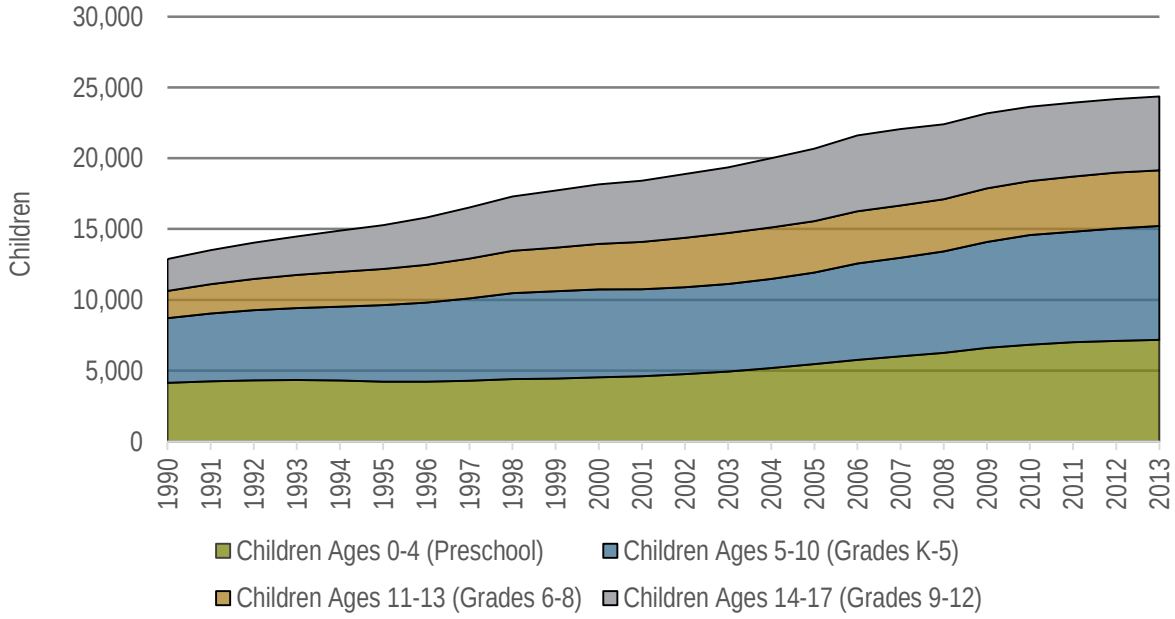
Figure 25. MSB School-Aged Children, by Race/Ethnicity, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 26 shows the total number of children in the MSB, ages 0 to 17, divided by schooling cohorts, from 1990 to 2013. The total population of children in 2013 was over 24,000. The population of children in 1990 was nearly 13,000 and has increased steadily every year through 2013. The schooling cohort with the most number of students was Grades K-5, which had over 8,000 students in 2013. The schooling cohort with the fewest number of students was Grades 6-8, which had a total of over 3,900 individuals in 2013. The total number of children aged 14 to 17 was over 5,200 in 2013, while the number of preschool children was nearly 7,200 in 2013, representing approximately 29.4 of the total number of children in the MSB.

Figure 26. MSB Children, by School Cohort, 1990-2013

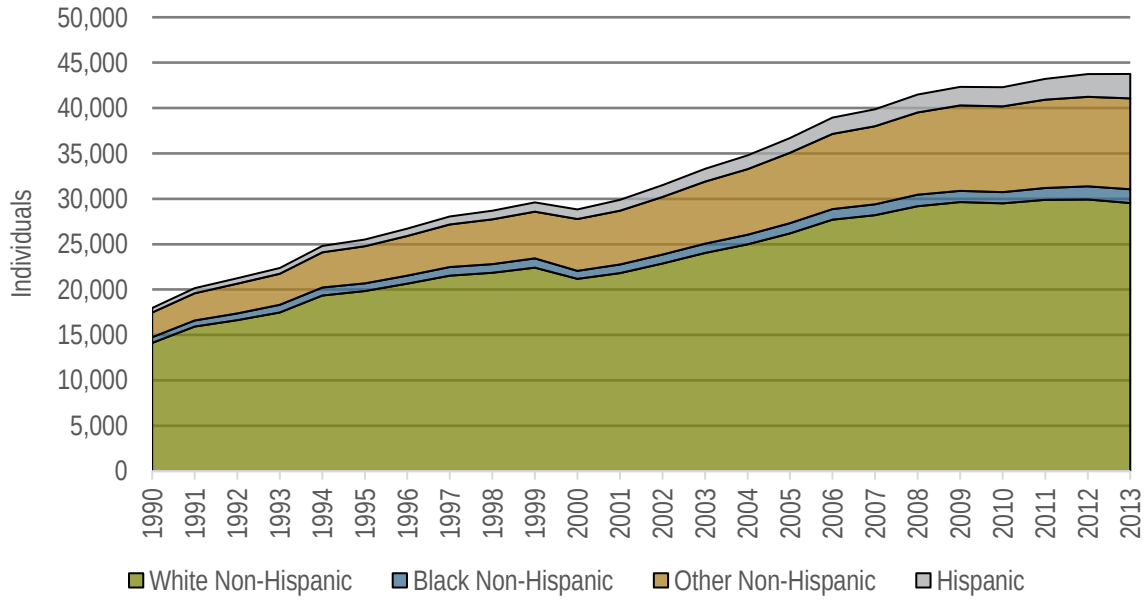


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.4 Labor Force

Figure 27 shows the labor force for the MSB, divided into major racial/ethnic categories, from 1990 to 2013. The total labor force of the MSB in 2013 was nearly 44,000 individuals. The total labor force in 1990 was almost 18,000 and increased through 1999 to a total of nearly 30,000 before declining slightly in 2000. Since 2000, the total labor force has increased every year through 2013. Since 1990, the number of White non-Hispanics in the labor force has increased from around 14,000 to almost 30,000 in 2013. Since 1990, the overall numbers of African-American/Black non-Hispanics in the MSB labor force have increased from 600 to 1,500 in 2013. The racial ethnic groups with the largest proportional increase are those classified as Other non-Hispanics, which totaled over 2,700 in 1990 and increased to over 10,000 in 2013. The overall number of Hispanics/Latinos also increased from an approximate total of around 500 to almost 2,700, representing approximately 6.2 percent of the total labor force in 2013.

Figure 27. MSB Labor Force, by Race/Ethnicity, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.5 Employment

Figure 28 and Figure 29 summarize employment for the MSB. Figure 28 divided into private sector and government employment. Total employment for the MSB in 2013 was over 34,000 individuals. The total employment for the MSB increased steadily from 1990 to 2009, when it grew from nearly 13,000 to over 32,000 individuals. Total employment stayed relatively constant in 2010 and 2011 before increasing in 2012 and 2013. In 2013, total private sector employment represented approximately 83.9 percent of all employment in the MSB, which was an increase from 77.8 percent in 1990. Figure 29 shows a more detailed breakdown of total government employment. The total government employment in 2013 was approximately 5,500 individuals, up from 2,800 in 1990. Employment increased to around 3,300 1995. Since 1997, the total number of government employees in the MSB has increased annually or remained relatively constant. Military employment shown represents reserves and National Guards and by 12.1 percent of all government employment in the MSB.

Figure 28. MSB Employment, by Private and Government Sectors, 1990-2013

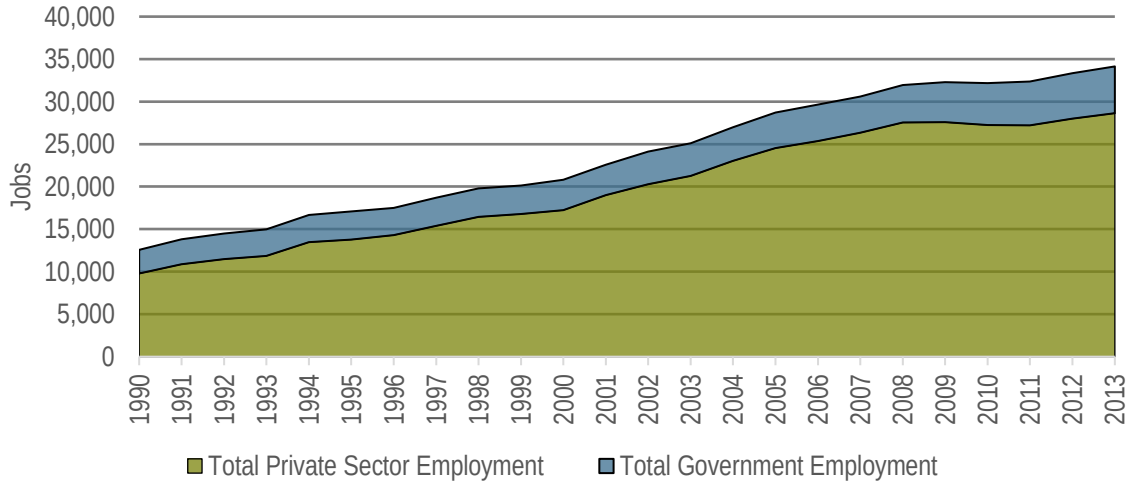
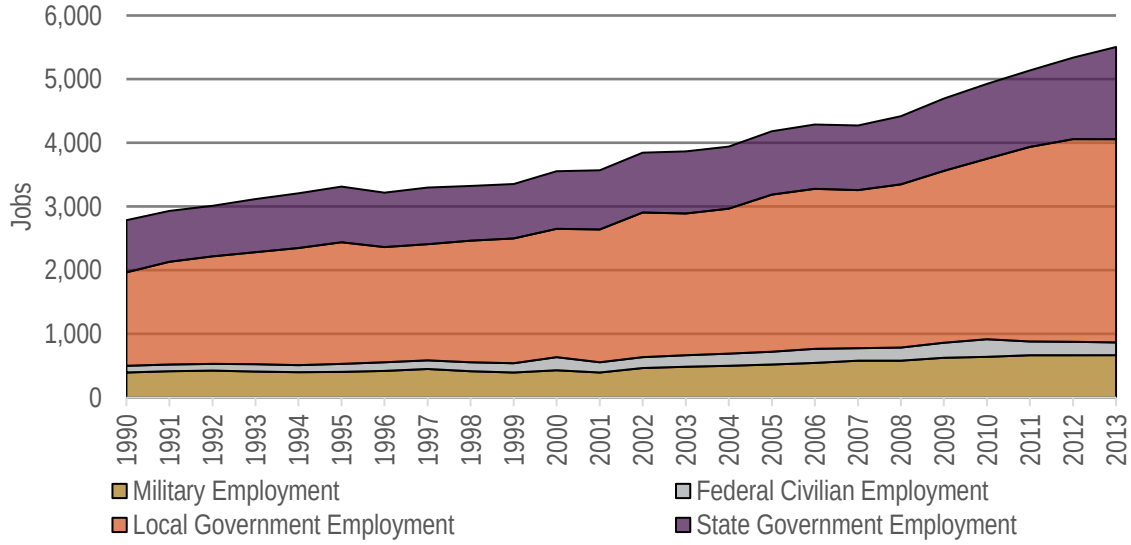


Figure 29. MSB Government Employment, by Major Sectors, 1990-2013

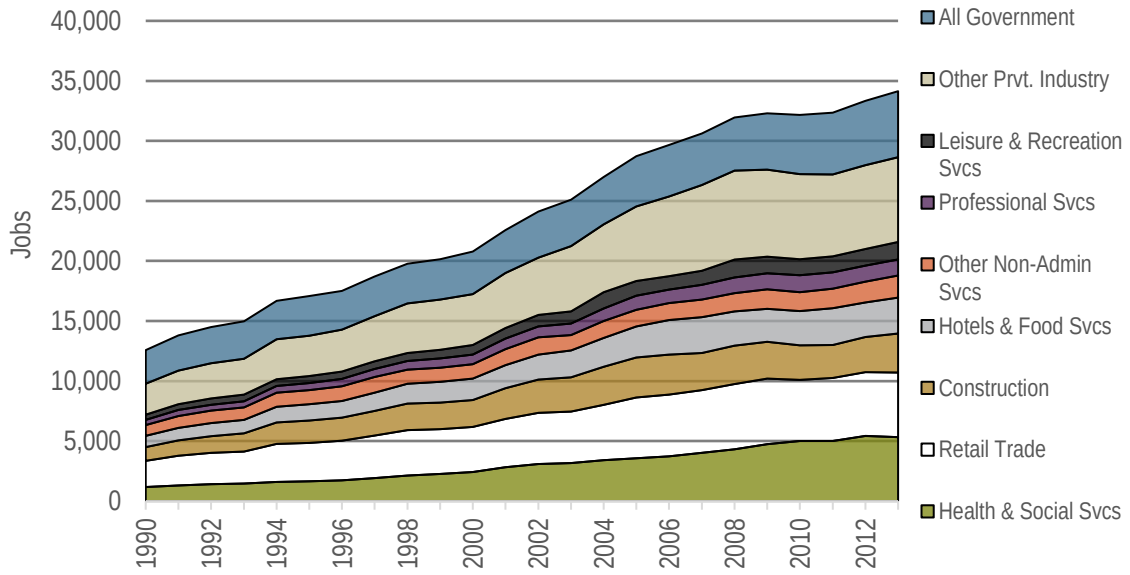


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.6 Jobs by Sector

Figure 30 shows the total number of jobs in the MSB, divided into primary employment sectors, from 1990 to 2013. The total number of jobs in 2013 was over 34,000. The total number of jobs in the MSB in 1990 was nearly 13,000, which increased steadily until 2008, at which point growth remained relatively constant until increases in 2012 and 2013. Aside from government services, the single sector with the greatest number of jobs was retail trade, with nearly 5,400 jobs in 2013, up from nearly 2,200 jobs in 1990. Health and social services had the second-largest number of jobs in 2013, with over 5,300.

Figure 30. MSB Jobs, by Major Private Sectors, 1990-2013

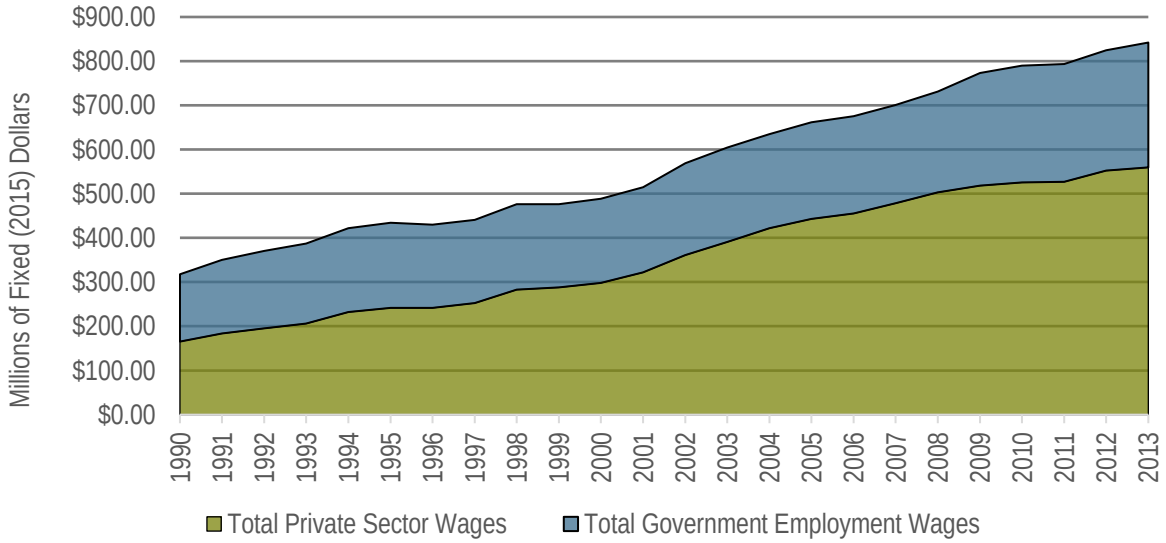


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.7 Income and Spending

Figure 31 shows the total wages for the MSB, divided into private sector and government employment, from 1990 to 2013. Total wages for the MSB in 2013 were over $840 million. The total amount of wages for the MSB increased steadily since 1990, when it was nearly $320 million. Wages from private sector employment accounted for approximately 66.5 percent of all wages in the MSB in 2013. This proportion is higher than in the early 1990s when the percentage of private sector wages represented between 52.0 and 55.1 percent of the total wages in the MSB.

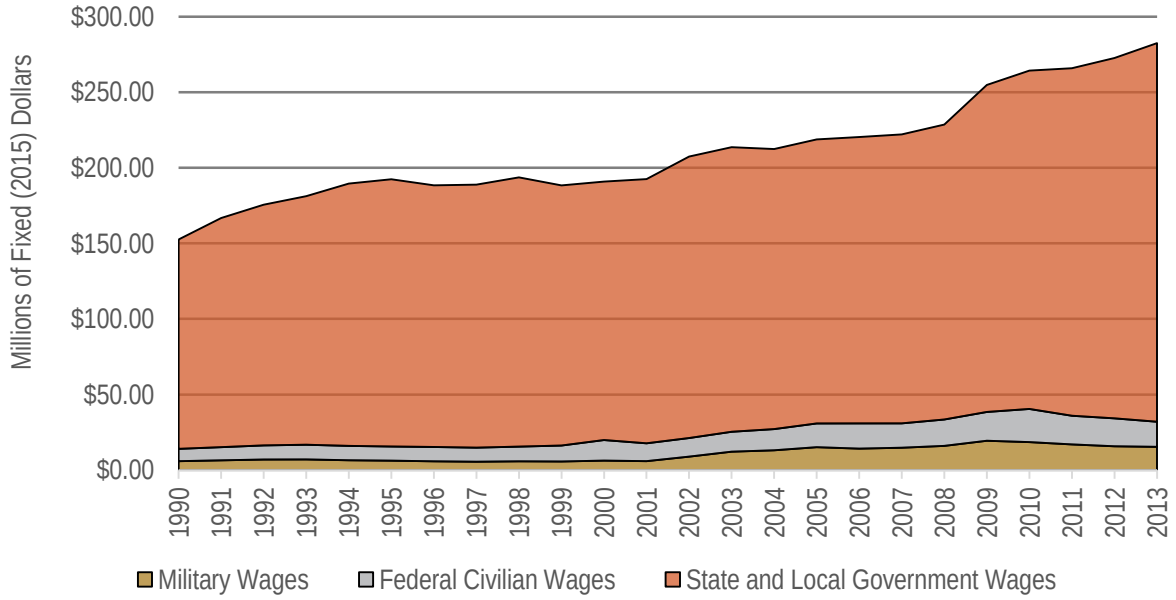
Figure 31. MSB Total Wages, by Private and Government Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 32 shows a more detailed breakdown of total government wages from the MSB from 1990 to 2013, divided into local and state government wages, federal civilian wages, and military wages. The total amount of wages from government employment was approximately $282 million in 2013. Government wages in 1990 were almost $153 million before increasing to almost $194 million in 1998. Slight decreases occurred in 1999 and 2004. Since then, government wages generally increased or stayed constant year-to-year. The majority of government wages in the MSB are earned from jobs at the local and state government level. Military wages were over $15 million in 2013, representing approximately 5.5 percent of all government wages in the MSB that year.

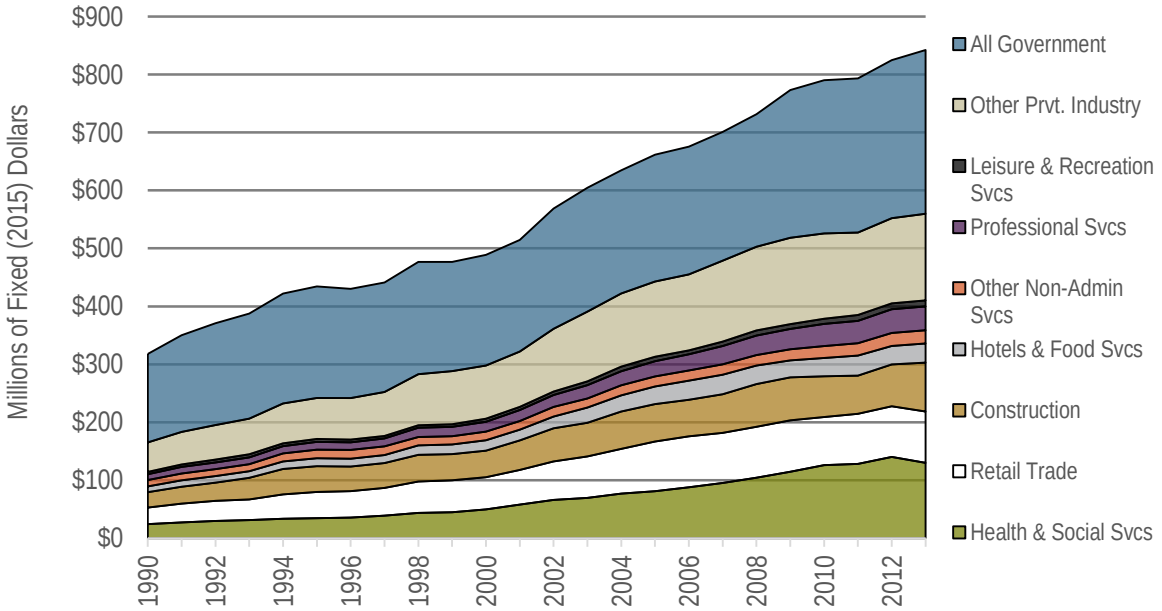
Figure 32. MSB Government Wages, by Major Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 33 shows the total wages in the MOA, divided into primary employment sectors, from 1990 to 2013. The total amount of wages was over $842 million in 2013. In 1990, the total wages were nearly $318 million and increased to almost $434 million in 1995 before declining slightly in 1996. By 2001, total wages had exceeded $514 million and continued to increase annually through 2013. Aside from government services, the single sector with the highest total wages was health and social services, with over $130 million in 2013, up from over $24 million in 1990. Retail trade had the second-highest total wage amount in 2013, with nearly $89 million. In 1990, retail trade had the highest amount of wages of any single sector aside from government.

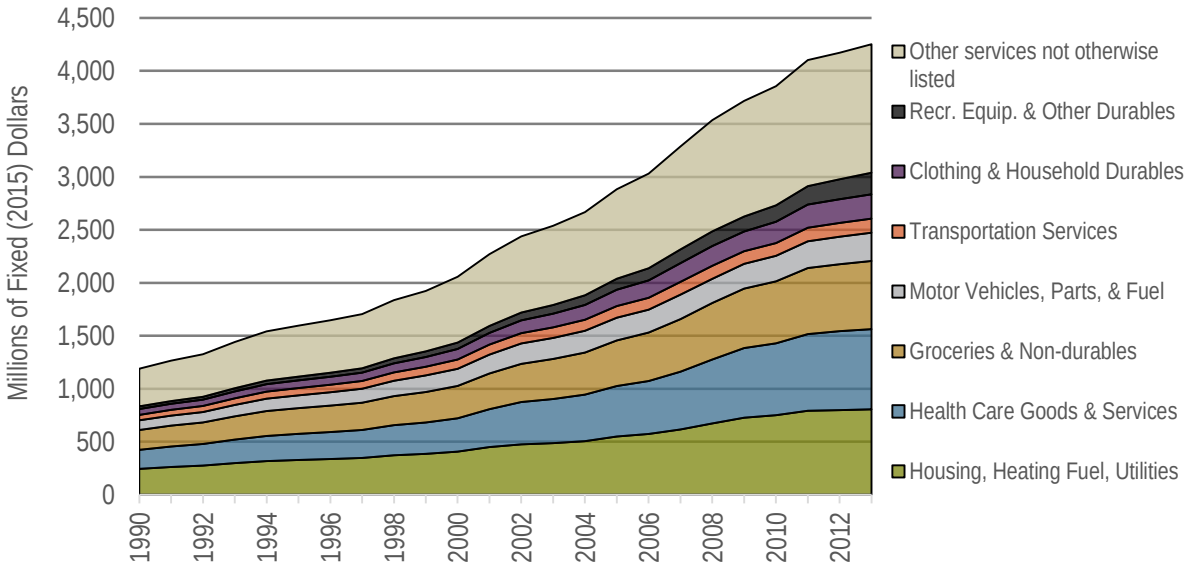
Figure 33. MSB Private Sector Wages, by Major Sectors, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

Figure 34 shows the total amount spent on goods and services by households in the MSB, divided into primary categories, from 1990 to 2013. The total amount of money spent on goods and services was almost $4.3 billion in 2013. The total amount of money spent on goods and services in the MSB in 1990 was nearly $1.2 billion. This total generally increased annually from 1990 to 2013. The category with the largest amount of spending has been the catch-all category of "other services not otherwise listed", with spending over $1.2 billion in 2013, and represented approximately 28.5 percent of all personal spending. The category with the second-largest amount of spending was housing and utilities, which was near $810 million in 2013 and represented approximately 18.9 percent of all personal spending.

Figure 34. MSB Personal Consumption Spending, by Major Categories, 1990-2013

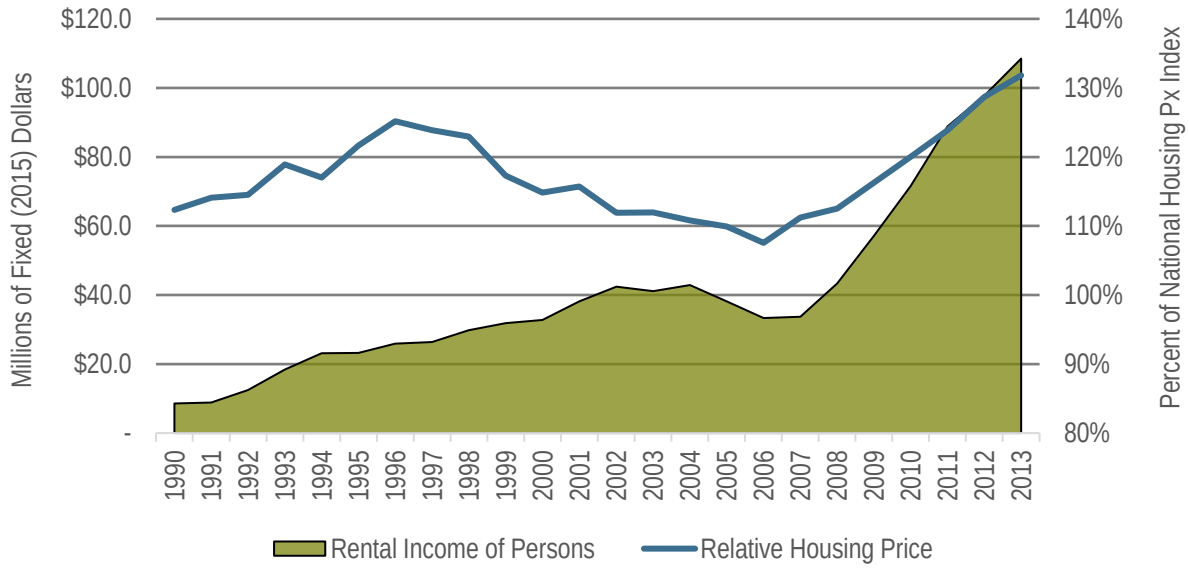


Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

2.2.2.8 Housing

Figure 35 describes current housing condition in the MSB broken out into rental income and housing prices. Rental income (in green) matched Anchorage in form, steadily rising from 1990 to 2004 from around $10 million to over $40 million. After a short decline between 2004 and 2007, rental income in the MSB has rose drastically, reaching over $100 million in 2013. Relative housing prices, in blue, were at 119 percent of the national average in 1990. In 1996 the market rose to 125 percent followed by a decline to 108 percent in 2006. In 2013, the housing market in the MSB was 130 percent of national averages.

Figure 35. MSB Rental Income and Relative Housing Prices, 1990-2013



Source: Figure developed by Northern Economics based on data from the Alaska REMI Model (REMI, 2015).

3 Qualitative Impacts

This Chapter provides a compilation from the Stakeholder and Public Process reflecting the general public's perspective of how the military and JBER contribute to the social and economic fabric of the region, and how potential impacts of the proposed force reduction are likely to be manifest. This public input is used to guide the analysis in terms of the topics that were investigated and reported upon.

3.1 Economic and Community Role of JBER Military Members and Families

Tend to be reliable homeowners and renters

Many people regard military families as being reliable, honest, and hardworking, with steady jobs, and they have long been a firm component of the housing market, even when oil dips and other sources of growth or home buying falter. Due to rapid turnover, the military contributes substantially to real estate and retail activity, and helps create a more robust market than other communities of comparable size.

Send their children to community schools

At Gruening Middle School in Eagle River, approximately 50 percent to 60 percent of students are from military families. The school receives grants from the military for such things as buses and after-school activities. Military dependents also enroll in other Anchorage School District and MSBSD schools. The Anchorage School District receives Federal Impact Aid for military dependents, particularly those that live on base.

Attend colleges and universities in the community

Military personnel, dependents, and veterans complete their college education in the area. Veterans were the most common military group in attendance. Veterans are often former active duty military who served at JBER and decided to come back to the area to complete their education. About 60 to 80 percent of the student body at Wayland Baptist University and about 10 to 12 percent of the student body at the University of Alaska Anchorage are military veterans. Veterans are also an important segment of enrollment for the Alaska Vocational and Technical School. Military personnel, dependents, and veterans bring funding to colleges and universities in the form of Tuition Assistance, the Post-9/11 GI Bill, and other military education benefits.

Bring a skilled workforce to the area

Military personnel are also important as employees. The police department reported a high rate of veteran employment, and up to 75 percent of security personnel for firms providing event security are military. In addition, the spouses of military personnel are employed in many sectors across the city, including hospitals, food and beverage, retail, service, and education. A good portion of retail employers encouraged military spouses to keep their jobs in other locations of the national chains if they have to relocate.

Spend money in the retail and restaurant sectors

The military has long been a major component of the retail sector, with a disproportionately large role in retail sales due to their age and short terms of residence in Anchorage. Whether buying new vehicles for Alaska conditions, or furnishing houses and purchasing supplies for babies and young children, service members and dependents were recognized as composing up to 30 percent of the clientele for many of these businesses.

The military personnel are a major economic driver in northeast Anchorage—the Tikahtnu Center was developed in large part to serve a military market, and it is now a major commercial center for the city. Sales to military personnel from the food and beverage sector are heavily concentrated near the bases. Specifically for beverage sales, military personnel represent 25–35 percent of sales. Military customers

also tend to be more interested in ethnic foods. For example, someone who has been stationed in Germany will be more interested in patronizing a German restaurant.

Military personnel buy vehicles, sporting goods, and firearms more frequently than the average consumer. Many lower-level enlisted soldiers may take on debt to do so.

Tend to be younger

Military personnel are generally young and many are unattached, so they tend to seek entertainment in the city. This can include frequenting bars, patronizing restaurants, and going to movies.

Volunteer in the community and are engaged in community activities

Military families have important roles in the community through volunteering and fulfilling public roles, and the military provides a certain amount of stability to the community.

Support recreation and tourism related businesses

Military service members and their families are very active in recreational activities, whether fitness recreation or hunting and fishing. They tend to buy sporting goods and use recreation/tourism services. Recreation equipment vendors were not represented, but those in attendance noted that sales to military members would be a noticeable income source to large vendors such as Cabela's, Bass Pro Shops, and 6th Avenue Outfitters, as well as smaller vendors like Barney's and AMH. Like other Alaska residents, military personnel invite out of state friends and families to visit.

The Alaska Department of Fish and Game (ADF&G) makes a special effort in outreach and education at JBER since many service members are new to the state and want to hunt and fish. ADF&G also cooperates with military authorities to enforce hunting and fishing regulations on base.

Support veterans in the area

Veterans make up a substantial percentage of Alaska's population. Approximately 10 percent of Alaska residents are veterans, which is one of the highest rates in the nation. The rate of military personnel that stay in the state after retirement is over 50 percent. As a result, Alaska supports veterans through good health care and available employment. There are also community groups for veterans. Military personnel and their families provide a continuing source of new veterans as some people come back to or choose to stay in Alaska after retirement from the military. In addition, some services for veterans are partly based upon the current number of active duty military personnel at JBER.

3.2 Economic Impacts of the Proposed Force Reduction

Housing Market Impacts

Focus group and key informant participants noted that if the military force were to be reduced, there would be impacts to the availability and values of real estate in the housing market. An increase in housing inventory at a time of potentially declining numbers of buyers due to other economic factors could result in declining property values. There would likely be an increase of housing availability on base. One interviewee noted that there is currently a housing shortage in the MOA, and a force reduction could provide some relief toward that shortage. A reduction in force could also impact the housing market in Eagle River, Wasilla, and Palmer. Cost of homes is lower in those areas than in Anchorage, and there are a large number of military residents.

Education Impacts

Key informants noted that school enrollment could decline if there were fewer military personnel with dependents. Fewer military children attending Gruening Middle School in Eagle River could reduce the funds from military grants for buses to the base and for after-school activities. In the ASD, it was

estimated that a reduction of 1,000 students would likely eliminate approximately 42 teacher positions and 4 staff positions.

There could be ripple impacts to military enrollments at the University of Alaska University system, as well as other smaller colleges, such as Wayland Baptist University and Alaska Vocational and Technical School. Money sourced from military education benefits would be lost.

State and Municipal Budgetary Impacts

Focus group attendees emphasized the compounding effects of reduced state and municipal spending with likely large job losses and declines in consumer spending. The reduction in military forces would have an immediate effect on the Alaska economy. The fiscal issues facing Alaska could have a more long term and drawn out impact on the state. With both occurring around the same time, impacts of each could be amplified. Retailers stated that they would potentially have to respond immediately to the reduced sales by reducing inventories or laying off personnel. Participants stated that a loss of retail sales to military personnel would have immediate and drastic consequences.

Retail and Community Impacts

The Muldoon Town Center, Northway Mall, and fast food businesses felt they would be strongly affected, with some businesses in Eagle River potentially affected, although this will be mediated as Eagle River residents do a lot of their spending in Anchorage or other places outside of the community. It was suggested that the MSB would also be adversely impacted because a large proportion of residents are military.

Interviewees stated that moving companies could be heavily impacted. A large proportion of business in this sector comes from the military personnel, and they tend to move a higher volume of cargo than non-military residents. They also contribute heavily to the storage sector of business.

Compounding Economic Impacts

Attendees asserted that a large economic downturn only makes the effects of force reduction worse as people will scale back on bars and restaurants and may substitute less expensive brands for those they would buy during better times. Impacts would ripple out, including into the tourism sector, since fewer military personnel would be here to invite their families to come to Alaska to visit. There was concern that declining population and economic activity might result in postponement of planned business expansions to Anchorage or relocation away from Anchorage for chain restaurants.

Utility and Service Provider Impacts

Although JBER is the largest customer in revenue for Municipal Light and Power, they felt that impacts would be minimal, and they are already looking at offsetting options. Impacts to waste collection with fewer on-base personnel would be "not-negligible." At the Port of Anchorage, fuel shipments could decrease, but if the number of deployments stayed the same, use of the port for that reason would not be impacted.

Impacts from a force reduction on the police and fire departments would depend on whether or not there were vacant lots (which have higher percentage of fires), or if movement off base crowds the Anchorage housing market (which could increase medical responses). Neither the police department nor the public transportation sector would be significantly impacted.

Arts and Entertainment Impacts

With fewer people in Anchorage from the combined effects of the military drawdown and other economic forces encouraging people to leave Alaska, participants stated that the opportunities for arts and entertainment could diminish. Performing arts, movies, and sports venues may not be able to have as many events or attract talent to perform.

Recreation and Tourism Impacts

The reduction in soldiers would proportionally reduce user days and volunteer participation in the recreation sector. As an example, fewer fishing license sales may result in reduced staffing at ADF&G and reduced outreach work. Retail for outdoor recreation could be heavily impacted as well, as military personnel tend to spend money on large items like ATVs. They also tend to spend more money because they are buying gear "from scratch"—meaning they often do not own the proper equipment before coming to Alaska and must purchase all necessary gear.

Veteran Support Impacts

Participants in focus groups and attendees at public meetings expressed concern that a force reduction could result in a decline of the community support for veterans (such as health care). One commenter at a public meeting expressed concern for the psychological effect a lack of these types of supports could have on veterans.

4 Regional Level Quantitative Impacts

In this chapter we document the impacts of the proposed force reductions from a quantitative perspective using the Alaska REMI Model. As described in Section 1.2.3 on page 8, the Alaska REMI Model uses a complex series of algorithms to estimate the socioeconomic impacts of a change to existing conditions. The Alaska REMI Model is dynamic in that it recognizes that most changes to communities and economies are not instantaneous one-time shocks that can be captured and summarized with relatively simple tools. Instead, the Alaska REMI Model recognizes that the driving factors of the change are often felt over a period of years, and that the impacts of those changes as they ripple through the community and the economy are wide-ranging and felt not only at the center-point the change but in other components and sectors of the Region.

This report assesses the impact of a proposed transformation of the 4-25th from a full Airborne Brigade Combat Team (ABCT) to a much smaller Airborne Task Force (ATF). As proposed, the reduction in forces would cut the 4-25th from 3,590 soldiers, if fully staffed at strength levels commensurate with its Table of Organization and Equipment (TOE) by 2,630 soldiers to a new TOE with 960 soldiers. While this cut of 2,630 soldiers is the focus of the impact assessment, we also discuss an alternative reduction of 1,993 soldiers to the "Validated" Airborne Task Force (ATF) which would include 1,597 soldiers. Impacts of this second option will primarily be used to indicate that the range of impacts under the potential cuts is quite broad, and are highlighted in Appendix B: Major Indicators Forecasted using Validated ATF.

The vast majority of impacts measured and estimated by the Alaska REMI Model are the result of the reductions in soldiers and their families and the elimination of their spending from the Anchorage economy. As indicated in Section 2.1.2.1, a total of $184.5 million in annual personal consumption would be directly cut from the Alaska economy with the force reduction in place. In addition, earnings of spouses and other dependents of soldier would be eliminated, along with another $26.8 million in estimated direct operations expenditures, most of which are paid to moving and storage companies and to utilities (electricity, natural gas, and waste collection).

As described in Section 2.1.2.1 beginning on page 17, the analysis assumes that force reductions are initiated in June of 2017 and are phased-in consistent with the existing 3-year rotations prevalent in the military. For purposes of the analysis, the phased reductions are assumed to be completed by August 2019. Impacts of the force reduction will of course be felt immediately, and will continue to manifest themselves for many years as the affected communities, populations, and economic sectors adapt. In order to capture these long-lasting effects, the analysis will use figures and tables that summarize impacts from 2016 through 2030—from the year before the impacts would be felt, then looking over the next 14 years to 2030. It should also be reiterated that the analysis does not attempt to incorporate ongoing and future changes to the region and its economy resulting from low oils prices and the resulting fiscal crisis facing the state as whole. Instead, future impacts of the proposed force reduction will be measured against future baseline forecasts of social and economic conditions that are calibrated to reflect the most recent forecasts[17] of population and employment from ADOLWD (ADOLWD 2014, and 2016).

In general, there are two primary factors which lead to the overall changes in economics and demographics of the region as a result of the force reductions:

[17] Current REMI model data have been compiled through 2013; Alaska's current (July 2016) budget deficit, recent decline in worldwide oil prices, and statewide reduction in oil and gas-related employment are not factored into the current REMI model projections.

1) The **Direct Effects** resulting from the fact that fewer soldiers and their families will be living, working and playing in the MOA and the MSB. We have described these direct effects of the full 2,630 soldier reduction in some detail in Section 2.1.2, beginning on page 17.

2) The **Indirect and Induced Effects**: These are effects that occur as a result of the direct action. An example of an indirect effect would include a reduction in employees in a company providing paper products to USARAK. Induced effects are farther removed from the direct effect and, for example, would occur as households reduce spending as a result of changes in employment and income. While some economic tools (input-output models, for example) separate indirect effects from induced effects (which, in economic theory, are different concepts), the Alaska REMI Model doesn't explicitly distinguish between these two types of effects. This analysis will refer to these combined impacts as induced effects.

The impacts that are discussed in this chapter are intended to summarize the "big-picture" outcomes of the proposed force reduction. As such, this chapter will describe region-wide impacts for the MOA and the MSB and will not drill down to specific sectors, or smaller communities and neighborhoods. Individual sections of this chapter will focus on impacts to key elements and indicators of the regional economy including: population and demographic impacts; changes to employment, wages and salaries, and the labor force; changes in personal consumption; and overall changes in the housing market.

Chapter 5 will drill down to examine some of the effects of the proposed closures in more detail. For example, Chapter 5 drills to describe the residential locations of members of the 4-25th within the MOA and the MSB. Chapter 5 also includes a more detailed discussion of the impacts of the 4-25th on retail and restaurant trade, and discusses likely impacts to particular schools within the ASD and MSBSD.

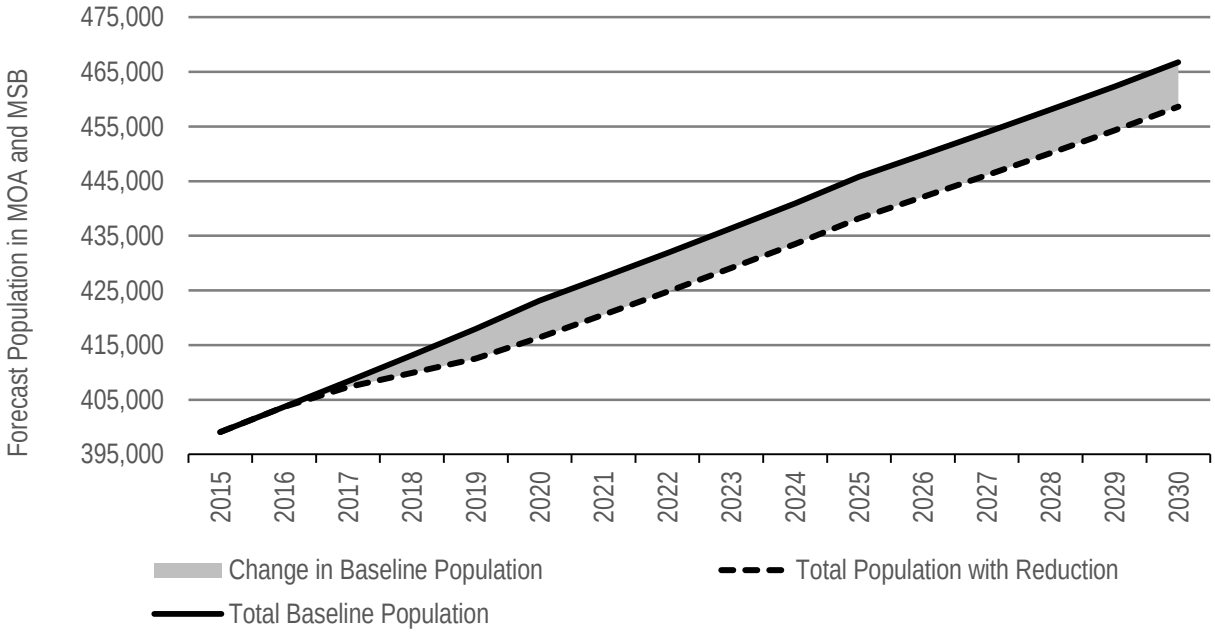
4.1 Demographic Impacts of the Proposed Force Reduction

This section summarizes the demographic effects of proposed force reductions. Section 4.1.1 summarizes the overall population effects, while Sections 4.1.2 through 4.1.3 drill down to summarize changes by area, age structure, and the racial/ethnic mix of the two boroughs.

4.1.1 Impacts on Population in the MOA and MSB

In the region as a whole, we find that a reduction of 2,631 soldiers from the 4-25^{th,} phased in over three fiscal years (FY 2018—FY2020) running from July 2017 through June 2020 will lead to an overall decline in MOA and MSB population **relative to the baseline forecast** of 8,153 persons by the year 2030 (Figure 36). While population in the MOA and MSB is projected to continue to grow even with the force reduction, population in 2030 is 1.7 percent smaller than it would have been otherwise.

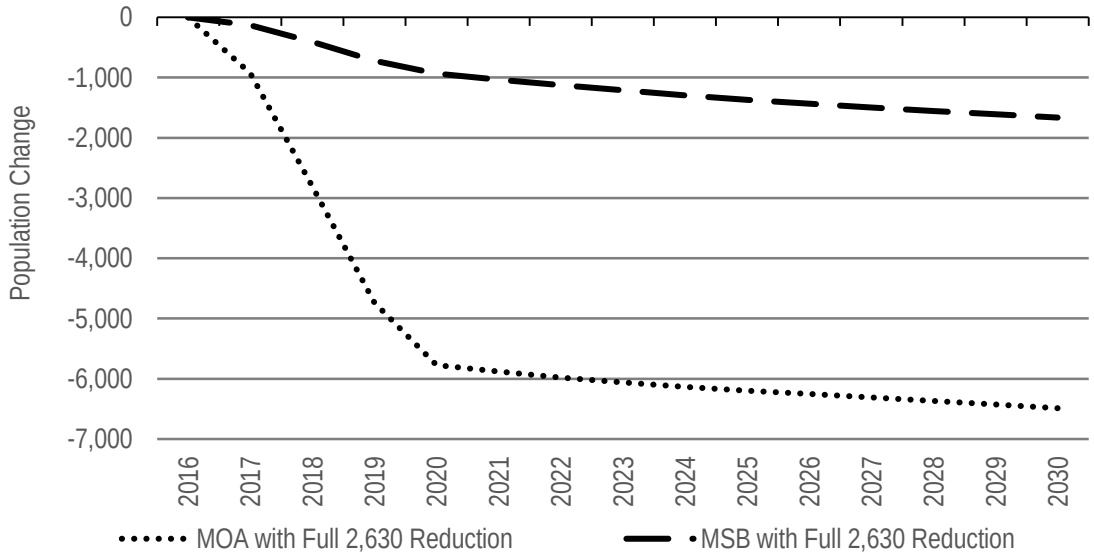
Figure 36. MOA and MSB Population Forecast with and without Force Reduction



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

Population changes relative to the baseline forecast for the MSB and MOA are shown individually in Figure 37 and percent changes by respective region are presented in Figure 38. We project that in 2020, the MOA will have 5,771 fewer people than without the reduction, and by 2030, population in the MOA will be an estimated 6,489 (2.0 percent) less than it would have been in the baseline forecast. In the MSB, we estimate that there will be 936 fewer people in 2020, and 1,664 fewer people compared to the 2030 baseline on account of the reduction, or just over 1 percent.

Figure 37. Changes in Population from Baseline Forecasts in the MOA and MSB



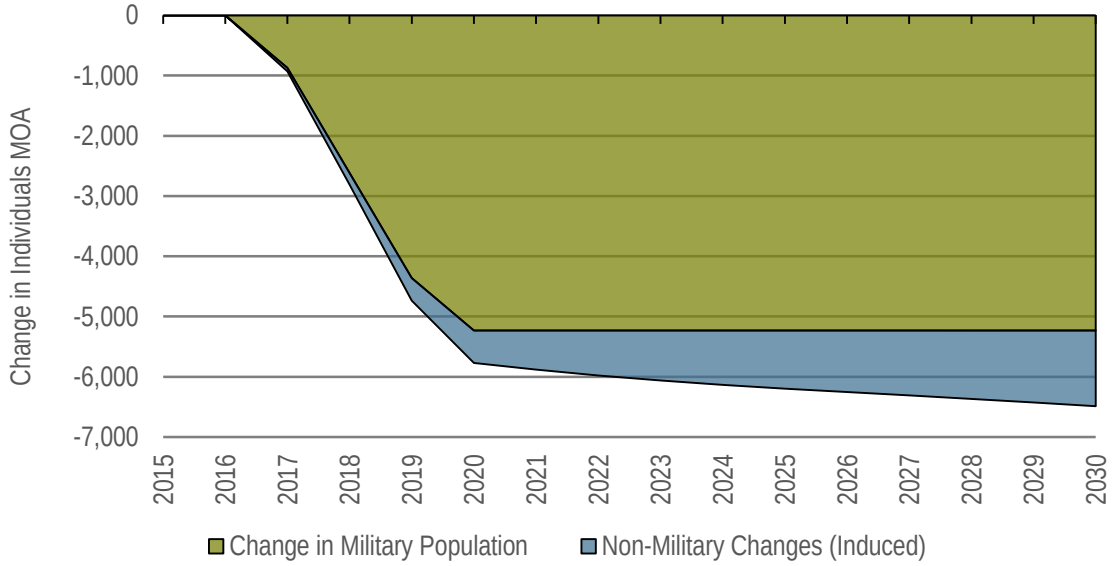
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

Figure 38. Percent Change from Baseline Population Forecasts

Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 39 and Figure 40 show direct changes (in green), and induced changes (in blue) for the respective regions. In the MOA, we project that by the end of the phased reduction (2020) there would be 5,233 fewer soldiers and their dependents, with those numbers then remaining flat for the remainder of the forecast. The induced population changes in the MOA are estimated to reduce by 538 in 2020 and continue for a much longer period, to just over 1,200 by 2030.

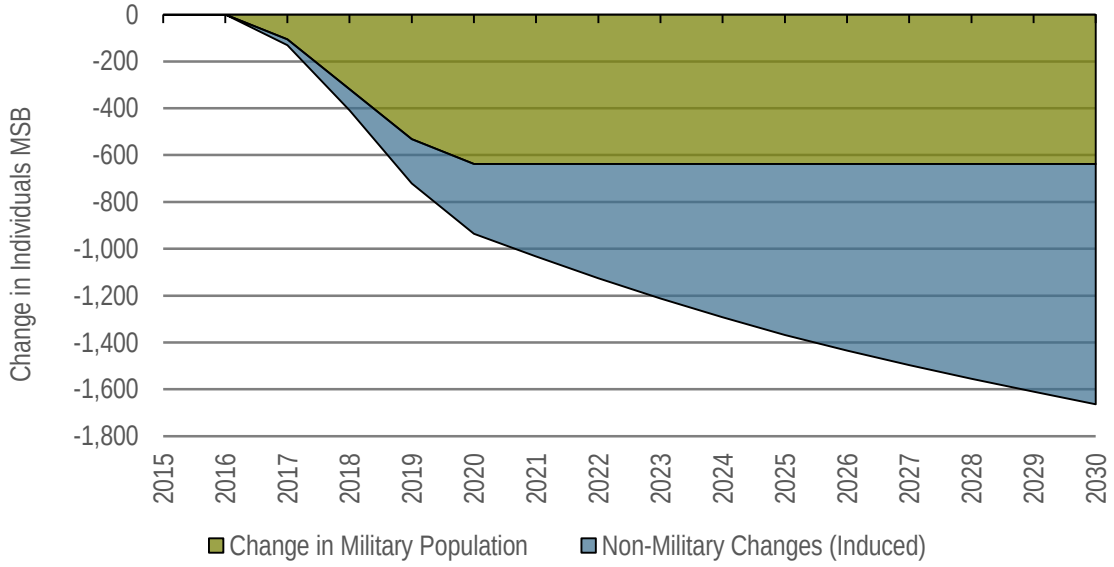
Figure 39. MOA Population Loss by Direct and Indirect Impacts



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

In the MSB, a much larger percentage of the population change is induced in the long run (Figure 40). In 2020 there will be an estimated 638 fewer active duty soldiers and dependents living in the MSB, and a modest induced loss in population of 298. By 2030, however, we estimate that 1,026 persons (62 percent of the total change) will be lost due to induced effects.

Figure 40 MSB Population Loss by Direct and Indirect Impacts



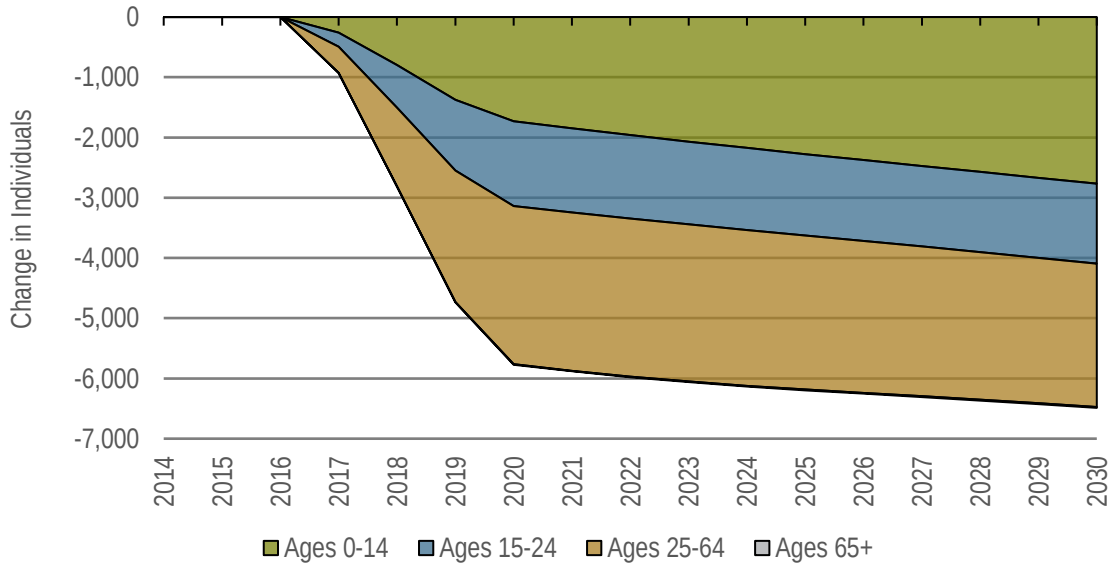
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

A careful examination of Figure 39 and Figure 40 reveals two different patterns in the forecast population changes between the MOA and the MSB. The population decline for the MOA has a very definite kink at the year 2020—the first full year after the reduction is phased in. The population change forecasts for the MSB do not exhibit this kink, and instead the slope of the lines representing the decline remains fairly constant. In other words, the population impacts in the MOA begin to stabilize and flatten relative to the baseline, while the decline in the MSB continues to increase in magnitude. The differing patterns result from the fact that the MOA is the primary source of population growth in the MSB, where the MSB serves as somewhat of an overflow for the MOA. Accordingly, population changes in the MOA need to stabilize for some time before population changes in the MSB, relative to baseline growth, flatten out.

4.1.2 Impact on Age Groups within the Population

Figure 41 shows the direct changes resulting from the full reduction in soldiers and their families along with the induced population changes for the MOA, by age cohort. Three of the four cohorts are readily discernable, the fourth (Age 65+) doesn't appear in the figure because changes in this group are too small to be seen. The fact that there are no forecast reductions in this oldest of age groups is a clear indicator that the average age of the MOA will increase with the proposed force reduction.[18]

Figure 41. Population Changes in MOA by Four Age Groups



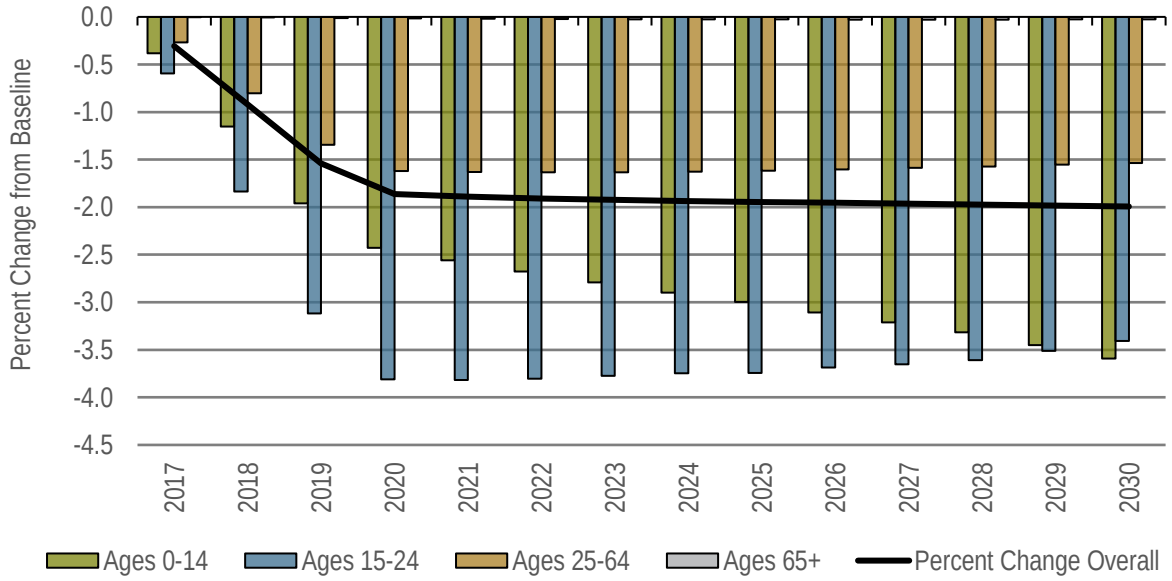
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

In Figure 41 above, we project that 2,381 fewer individuals aged 25–64 will be living in the MOA by 2030, and that decline will nearly match the reductions in the 0–14 age cohort with a reduction of 2,766. Of note is the fact that while the decline in the 25–64 age cohort stabilizes by year 2024, the

[18] The estimated average age of the MOA & MSB population increases from 37.3 years to 37.7 years of age.

magnitude of the decline of younger children (Ages 0–14) continues to increase through 2030.[19] Figure 42 presents the annual percentage change from the baseline forecast that is projected to occur in the MOA by age group. The overall percentage change is also presented as the solid black line. In the figure, cohorts with a percentage change larger than the average will make up a smaller portion of the overall population than in the baseline forecast. In other words, the proportion of persons from 0–24 years of age will be lower in the future with the force reduction than under the baseline forecast.

Figure 42. Percentage Change in MOA Population by Age Group



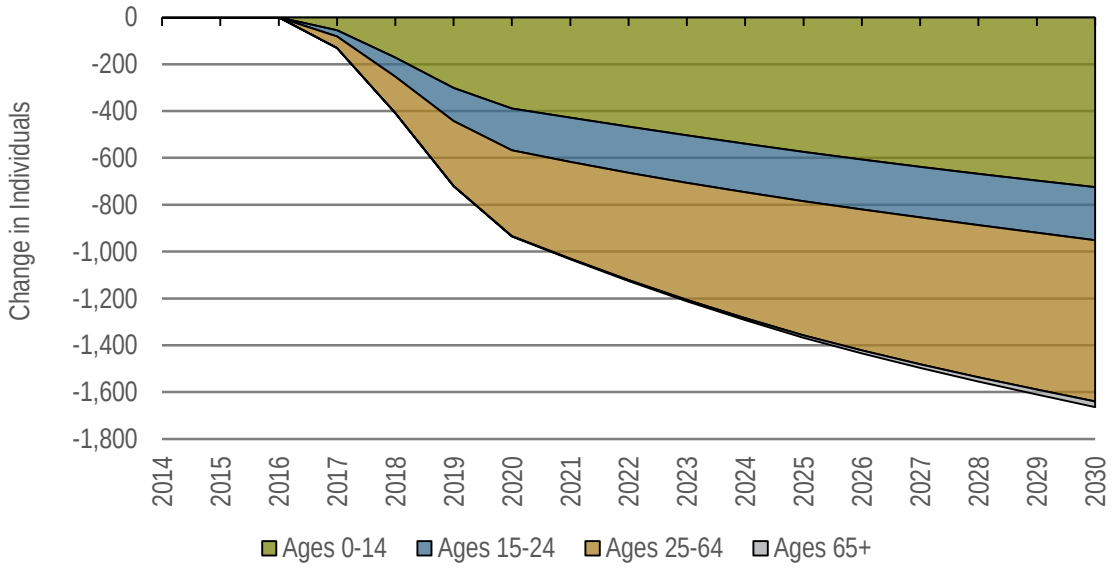
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 43 shows estimated population impacts by age group in the MSB. Of the roughly 900-person loss by 2020, around 400 will come from the 0-14 age cohort. The number of people between the ages of 25 and 64 is estimated to reduce by just under 400, along with 178 between the ages of 15 and 24. By 2030 the MSB will have an estimated 1,664 fewer people. In 2030, impacted age cohorts are largely the similar in proportion to 2020, however a negligible number of people belonging to the over 65 population are expected to be lost. This is a result of soldiers removed from younger cohorts in earlier years that otherwise would have retired in the state.

In percentage terms, the MSB is estimated to lose a higher percentage of people belonging to the 0-14 cohort than any other (2.3% in 2030), followed by ages 15-24 (1.4% in 2030), 25-64 (1.0% in 2030), and a small percentage of over 65 in later forecast years (Figure 44). In contrast to the MOA, where the age 15-24 cohort is shown to initially reduce by the largest amount, higher adolescent population decline in the MSB is expected because of the likelihood of larger family sizes and the fact that single enlisted soldiers are generally required to remain on base at JBER.

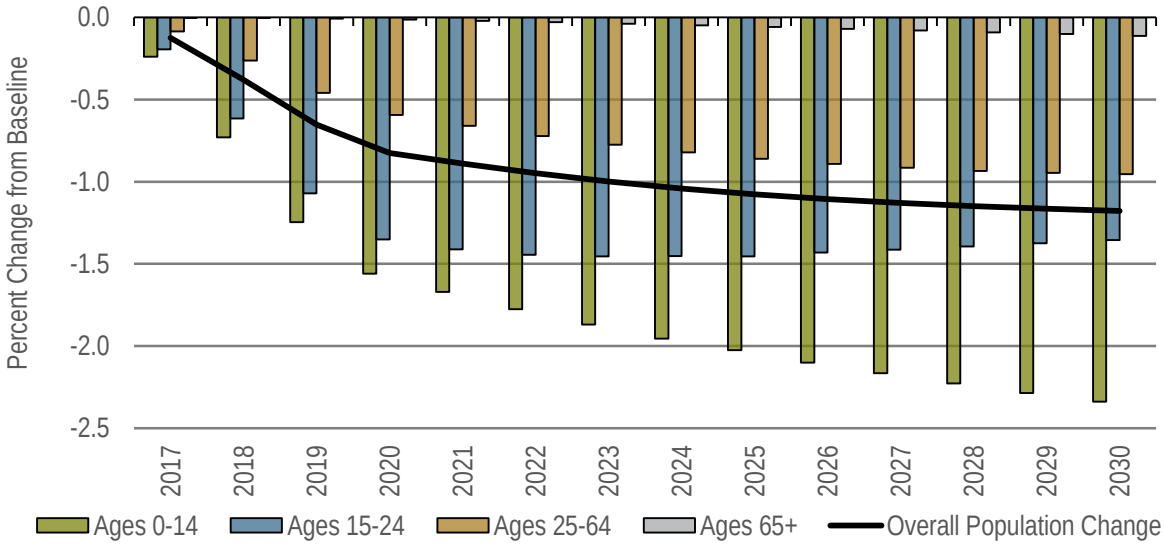
[19] The continuing decline in the number of young children in the MOA through 2030, which is in contrast to the leveling off that occurs with the Age 15-24 Cohort and the Age 25–64 Cohort, is a result of a decline relative to the baseline in natural population increases (i.e. births). This decline results from the relatively sudden decline in the "child-bearing" population.

Figure 43. Population Changes in MSB by Four Age Groups



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 44. Percentage Change in MSB Population by Age Group



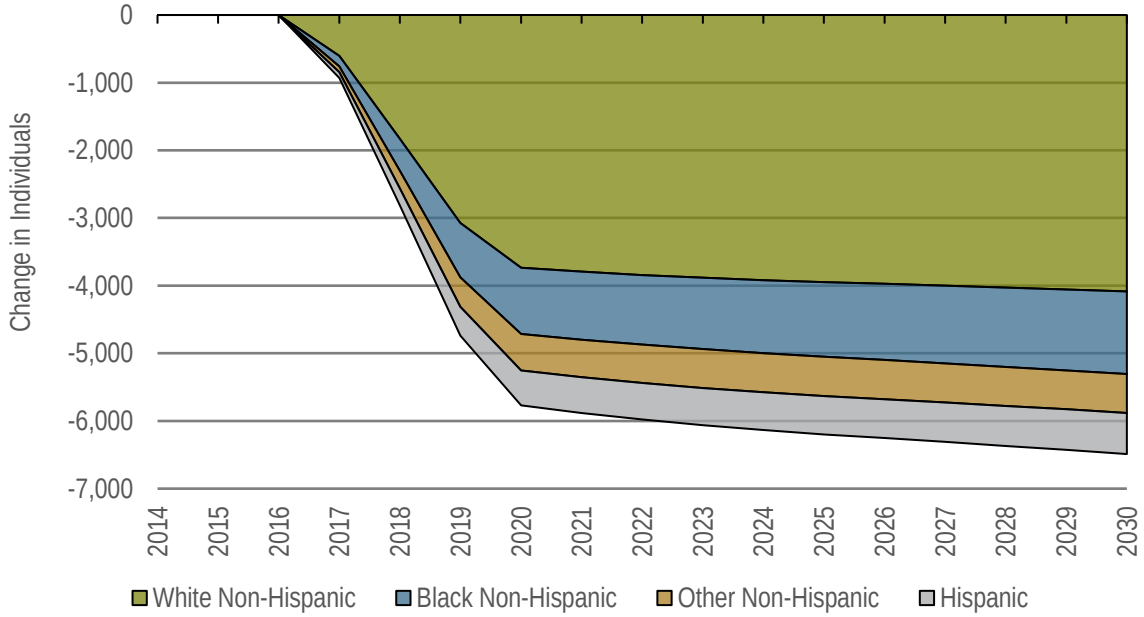
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

4.1.3 Impacts on Racial and Ethnic Diversity

The majority of the change in the Anchorage population resulting from the force reduction will be in the number of White non-Hispanics; however, there are also sizeable reductions in the number of all of the other racial/ethnic groups tabulated. Figure 45 shows that the total decline in the number of White non-Hispanics by 2030 relative to the baseline is projected to be 4,085. The total reduction change in the number of African-American/Black non-Hispanics—the racial/ethnic group with the second-largest absolute decline—is projected to be 1,221. By 2030, the decline in Other non-Hispanics is projected to be 574 and the decline in Hispanic/Latinos is anticipated to be 608 individuals by 2030 in the MOA.

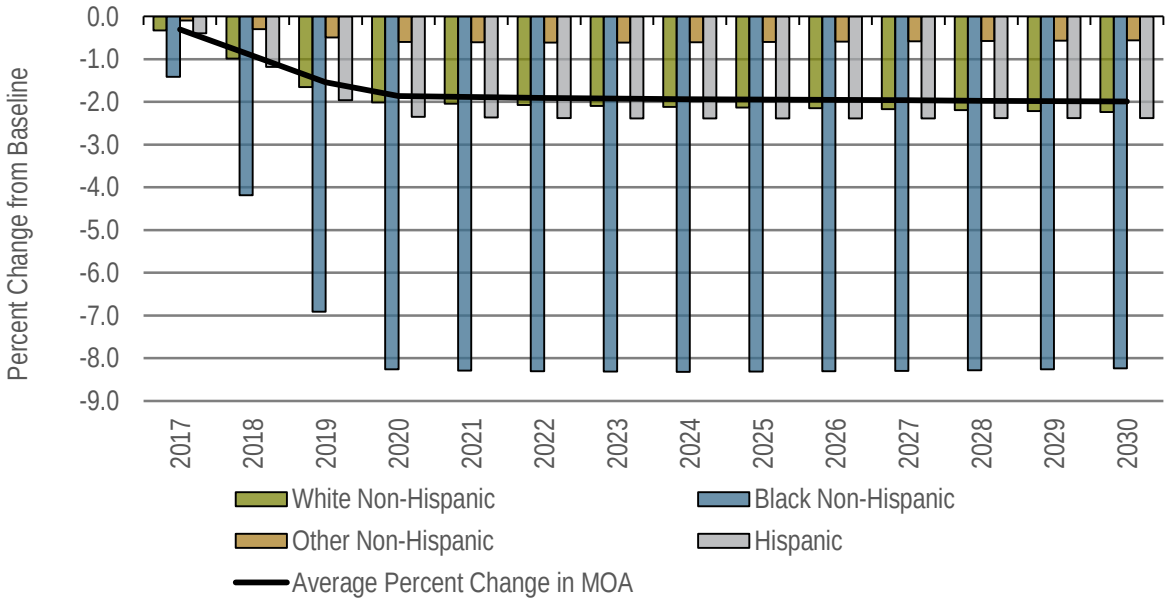
As noted in the discussion around Figure 6 on page 24, the racial/ethnic mix of the 4-25th is much different from that of the MOA and the MSB as a whole. Figure 46 presents a graphical representation of the annual percentage change from the baseline forecast that is projected to occur under the full reduction. In the figure, the solid black line represents the average percentage change for the MOA's population as a whole. If the racial/ethnic mix were to remain unaffected by the change, then the percentage change for each group would equal the average. With fewer soldiers and dependents, there will be a greater percentage reduction of Black Non-Hispanic than of all other groups, with declines exceeding 8.0 percent by 2020. Conversely, because the percentage of Other non-Hispanics in Anchorage is higher than within the 4-25th, the percentage decline for that racial/ethnic group is anticipated to be relatively low (less than 1.0 percent).

Figure 45. Change in MOA Population by Race/Ethnicity



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 46. Percentage Change in MOA Population by Race/Ethnicity

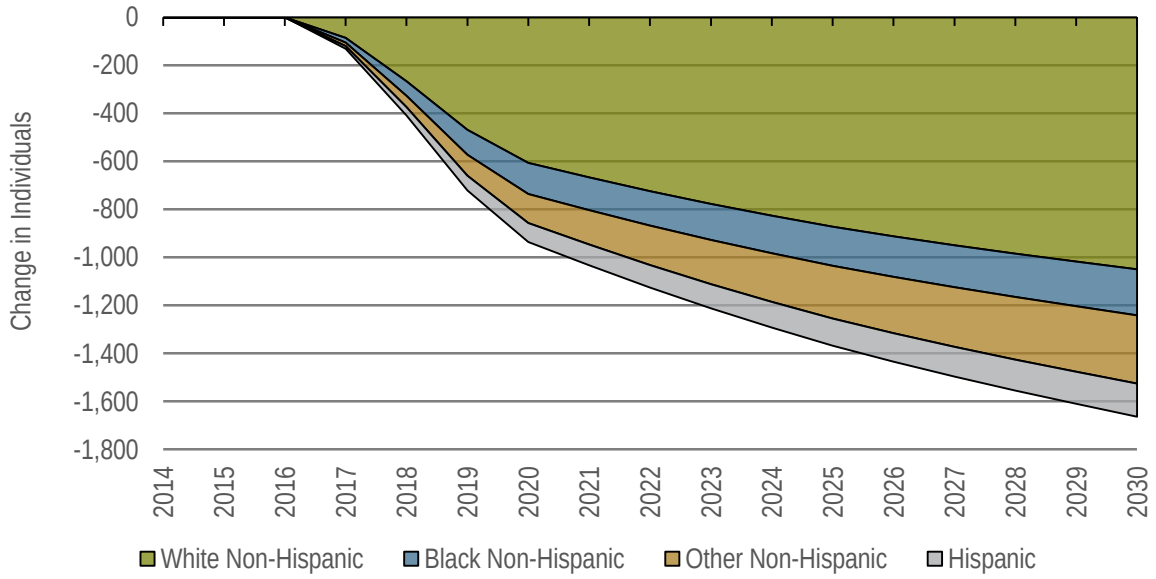


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 47 describes impacts to the MSB population in terms of race and ethnicity. Like impacts to the MOA, the MSB's project population loss associated with the reduction will be largely represented by fewer White non-Hispanics by 2030 (roughly 1,000). Other non-Hispanic and Black non-Hispanic populations are estimated to decline by 284 and 192 respectively, followed by the Hispanic population declining by just over 130 by 2030.

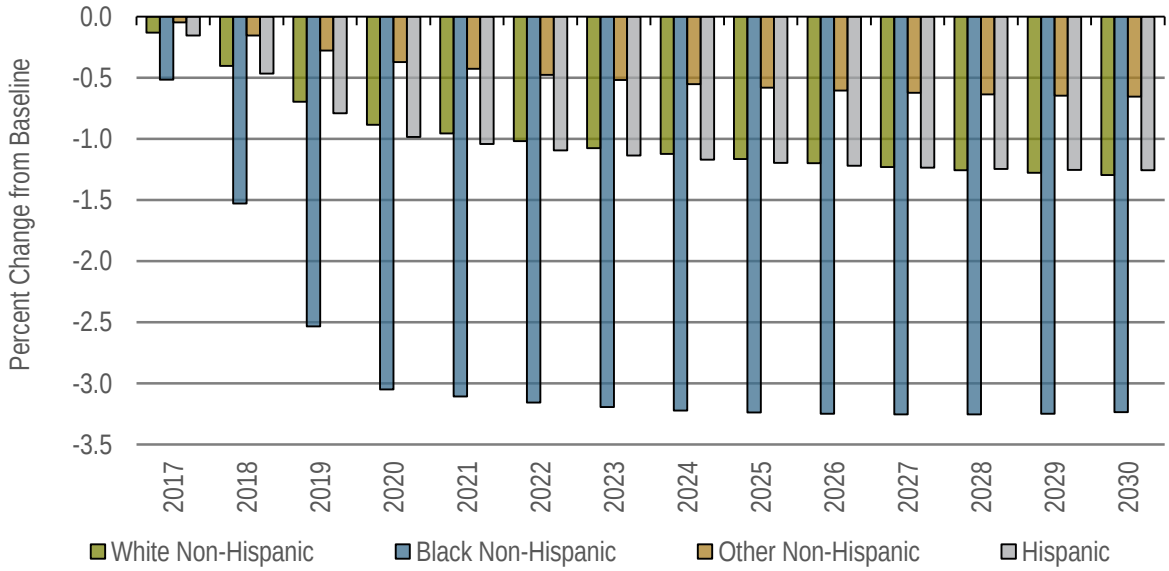
Although White non-Hispanics make up over 50 percent of the estimated population impacts in the MSB, the reduced in White non-Hispanic population caused by the force reduction represents just over 1 percent of the total White non-Hispanic population in the Borough as a whole (Figure 48) in 2030. The estimated reduction in Hispanic population will represent just over one percent of the total Hispanic population in the MSB and other non-Hispanic population reduction will come in at less than one percent of total other non-Hispanics. The 200 or so fewer Black Non-Hispanics estimated by 2030 represent the largest percentage reduction in the MSB of 3.2 percent.

Figure 47. Change in MSB Population by Race/Ethnicity



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 48. Percentage Change in MSB Population by Race/Ethnicity

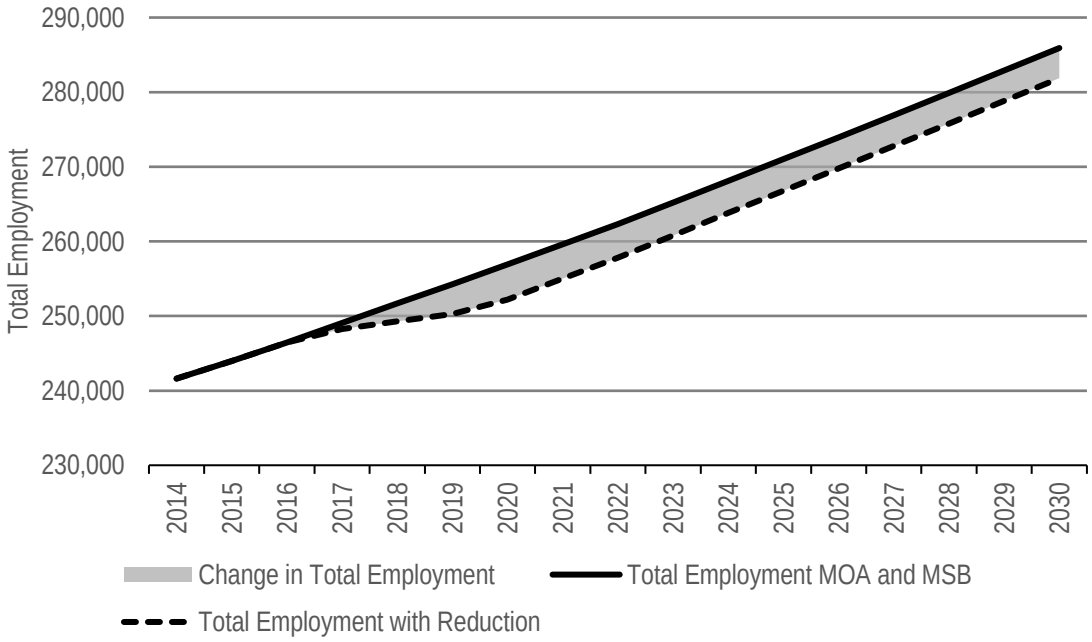


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

4.2 Employment Impacts of the Proposed Force Reduction

Total employment in the MOA and MSB is expected to increase into the future under baseline conditions. However, as a result of the force reduction, we expect lower job growth amounting to 4,720 fewer jobs by 2020, after which, employment will resume a trajectory similar to baseline growth (Figure 49). It is important to note here that employment impacts do not necessarily mean employees are being laid off, but rather, largely represents a reduction in active duty military and dependents rotating into JBER, or the number of jobs not created or filled by new employment that would have occurred otherwise.

Figure 49. MOA and MSB Employment Forecast with and without Force Reduction



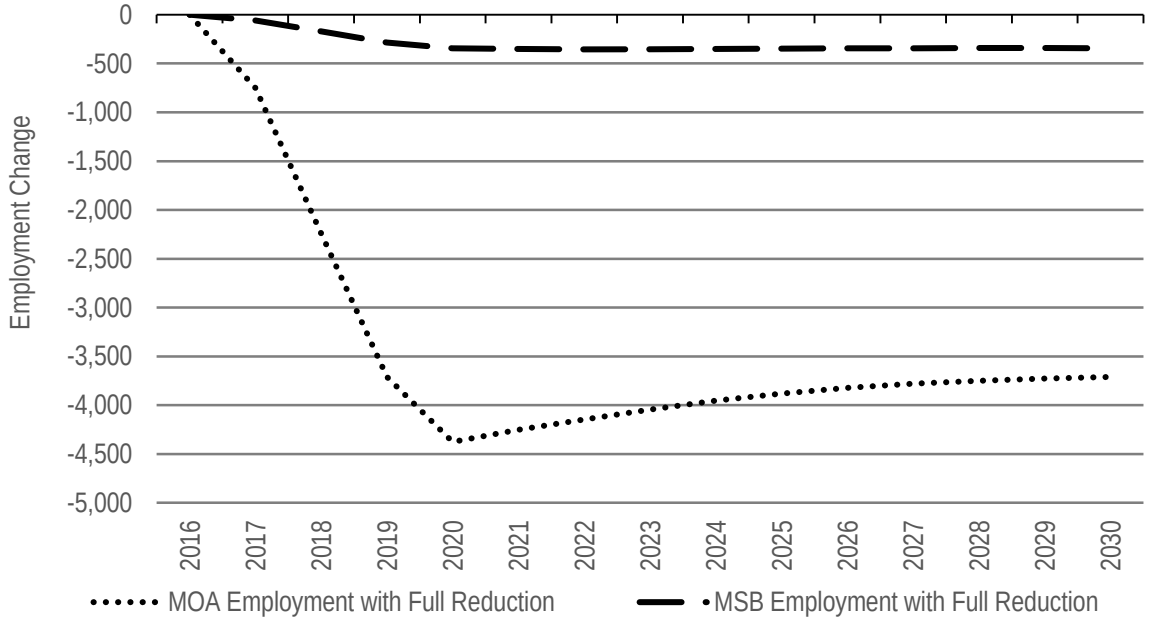
Note: Assumes the full 2,630 soldier reduction in the 4-25th.
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 50 presents the expected change in the total number of jobs broken out by MOA and MSB. Figure 51 gives the job reduction estimates in percentage terms of total baseline employment. In the MOA, we estimate a loss of 4,376 jobs associated with the reduction or 2.0 percent of total in 2020. In the MSB, we estimate 344 fewer jobs by 2020 or 0.9 percent of total employment.

As with changes in population, the pattern of changes in forecast employment is different in the MOA from the MSB. It is also important to note that employment is tallied at the place of work regardless of the place of residence. Since many persons that live in the MSB work in the MOA, the employment impacts reported for the MOA are felt in both locations. Interestingly, losses in the MOA associated with the force reduction are expected to lessen by 2030 to around 3,500, while losses in the MSB show slight recovery, but remain relatively flat compared to the Anchorage profile. The partial recovery in the MOA could be explained by the fact that in-demand positions, vacated by military dependents, will be filled over time after the reduction. The flatter employment profile associated with the MSB is also expected for reasons mentioned above. Since military and dependent employment is counted at the place of work, the MSB private and government employment impacts are largely induced. This means

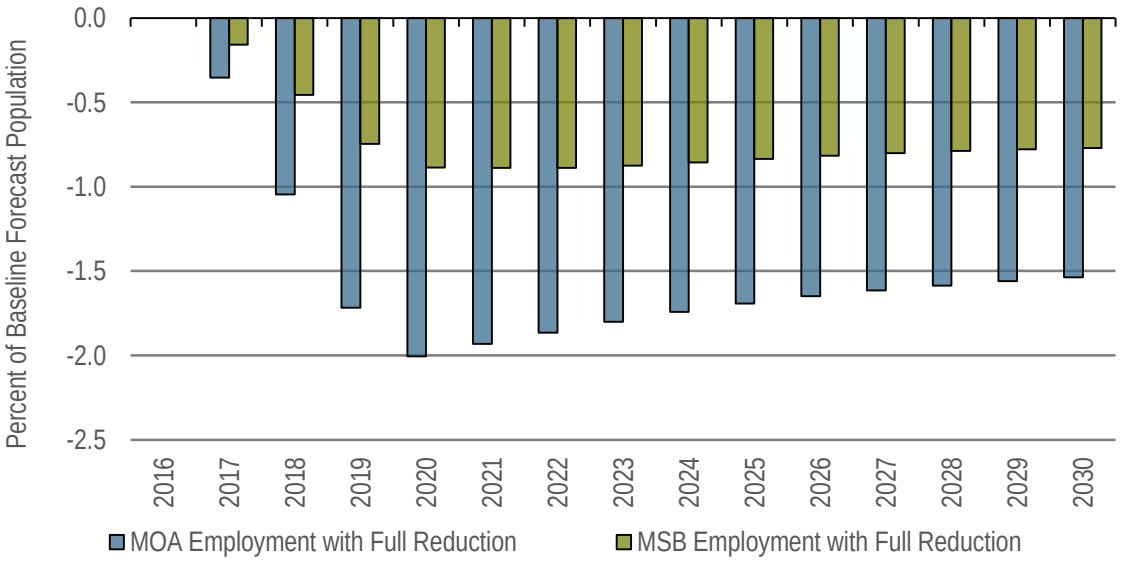
that the fewer jobs in the MSB are a function of persistent reduced spending, and likely represent a new employment equilibrium, rather than interim job vacancies.

Figure 50. Changes in Employment from Baseline Forecasts



Note: Assumes the full 2,630 soldier reduction in the 4-25thSource: Estimated by Northern Economics using the Alaska REMI Model

Figure 51. Percent Change from Baseline Employment Forecasts under Two Force Reduction Options

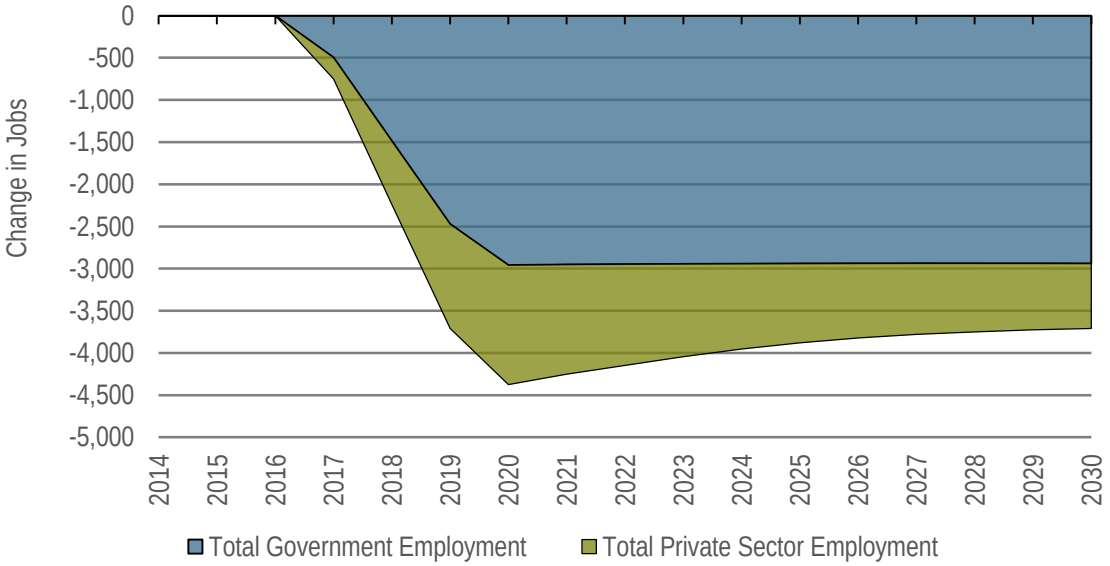


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

Figure 52 shows the projected employment changes in the MOA for government and the private sector under the full 2,630 reduction. By 2020, of the 4,376 reduction in employment, government employment is projected to decline by 2,958 while private sector employment is projected to decline by 1,417.

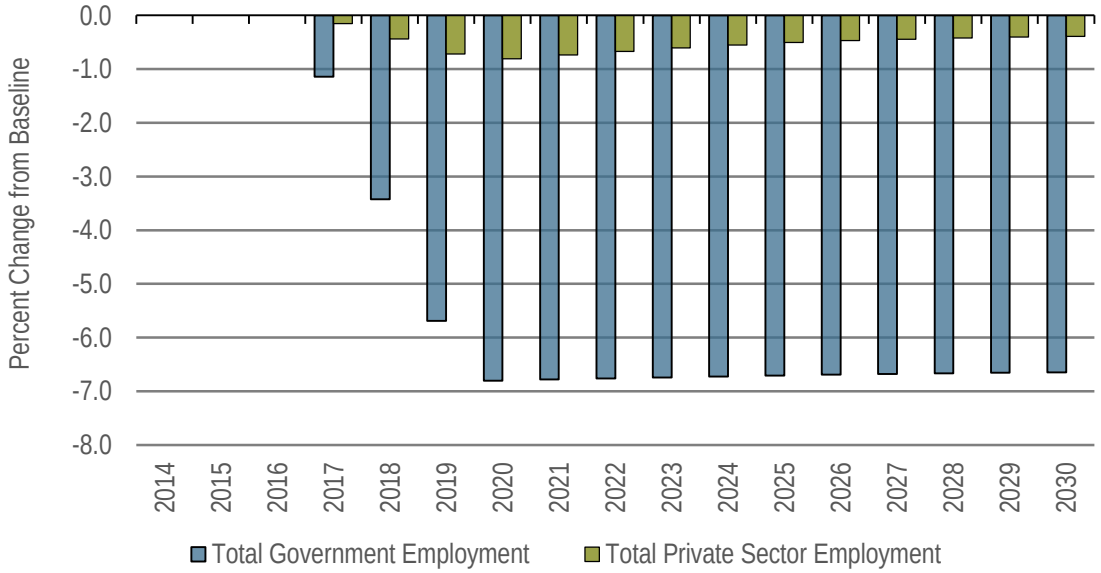
Figure 53 presents the annual percentage change from the baseline forecast of employment that is projected to occur with the full reduction in the MOA. The results indicate that there will be almost seven percent fewer government jobs by 2020 than projected in the baseline forecast. The percentage decrease remains in excess of six percent through 2030.

Figure 52. Projected Change in Private Sector and Government Employment in the MOA



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

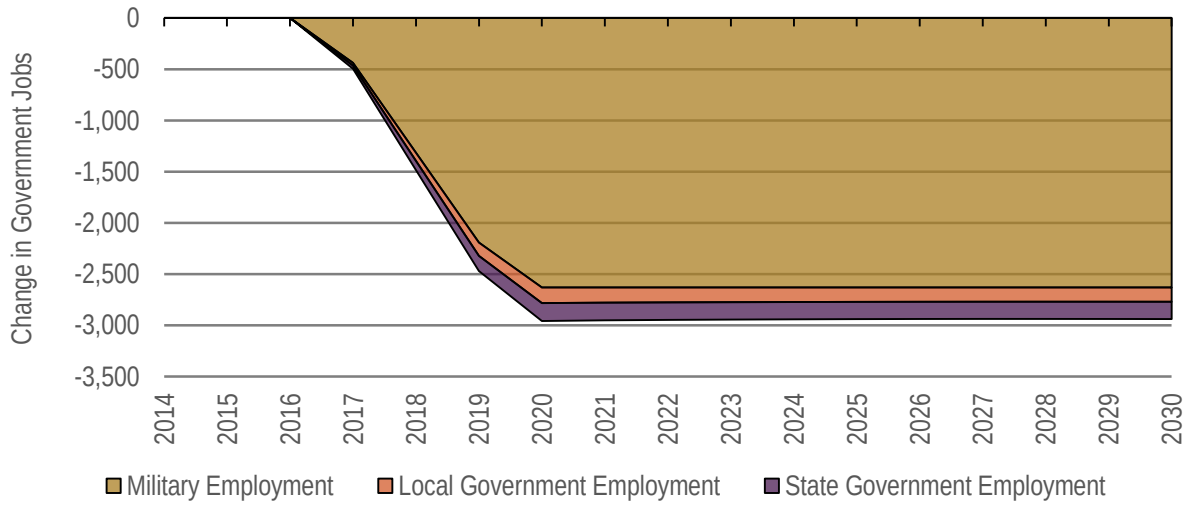
Figure 53. Percentage Change from Baseline Employment Forecasts in the MOA



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 54 shows the total change in government employment as a result of the full reduction in the MOA through 2030. The vast majority of changes in government employment are the direct employment reductions associated with the 4-25th (i.e., a reduction of 2,630 jobs by 2020). There are no projected reductions in federal civilian employment, because in general, changes in federal civilian employment occur only as a direct change mandated by an action of Congress or the Executive Office—the possibility of induced changes to federal civilian employment are not built into the REMI models. Government employment reductions beyond these direct effects are associated with the induced employment changes in State Government and/or Municipal Government. Of the latter, most are due to changes in the number of school district employees; these changes will be discussed in more detail in Chapter 5. As noted previously, government employment on the whole is anticipated to decline by 2,958 by 2020 compared to the baseline projection. Declines in local government and state government employment are anticipated to be 152 and 175 by 2020 compared to baseline projections, respectively.

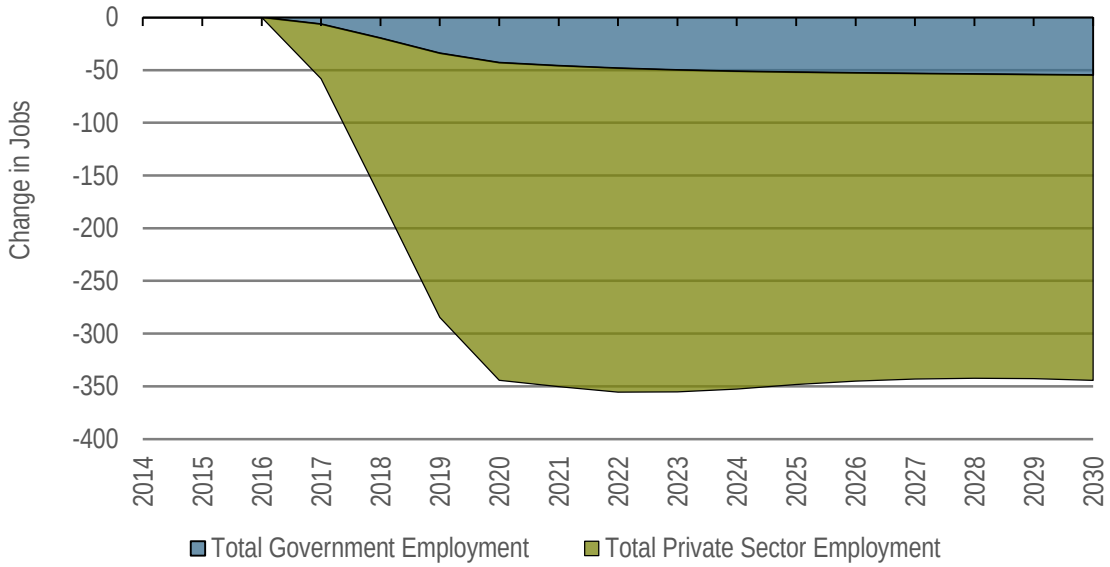
Figure 54. Government Employment Changes from the Projected Baseline in the MOA



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Shown graphically in Figure 55, by the year 2030 employment in the MSB is projected to decrease relative to the baseline by 350 overall, with a decline of 290 jobs in the private sector and a decline of 55 jobs in government sector. Again, in the MSB, all employment changes are induced because the direct employment reductions—the 2,630 soldiers from the 4-25th—all accrue to the MOA in spite of the estimated 131 soldiers associated with the 4-25th that live in the MSB.

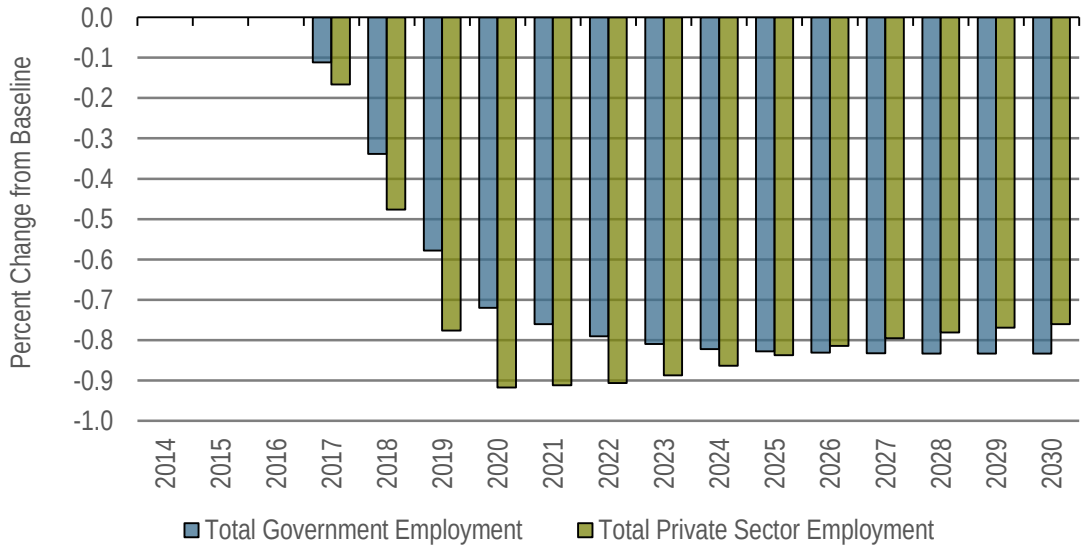
Figure 55. Projected Change in Private Sector and Government Employment in the MSB



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

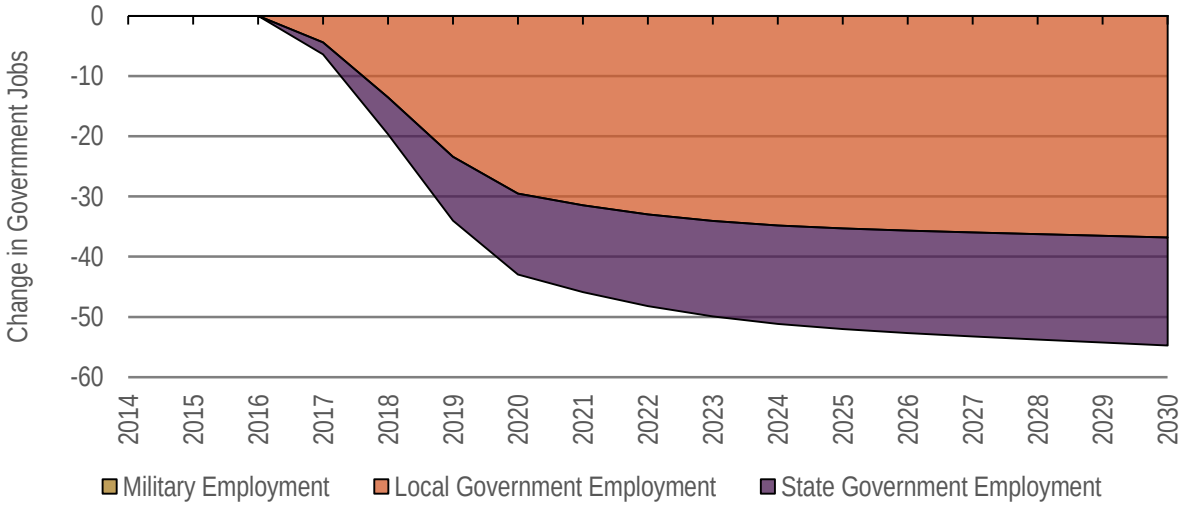
In percentage terms shown in Figure 56, MSB employment impacts are estimated to be minute. Private sector employment is anticipated to decrease around 0.9 percent from the baseline by 2020 before rebounding slightly by 2030; government employment is anticipated to decrease steadily from 2017 through 2030, peaking in 2030 at decline of 0.8 percent relative to the baseline. Shown in Figure 57, government job reductions in the MSB will consist of roughly 70 percent local and 30 percent state employment.

Figure 56. Percentage Change from Baseline Employment Forecasts in the MSB



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

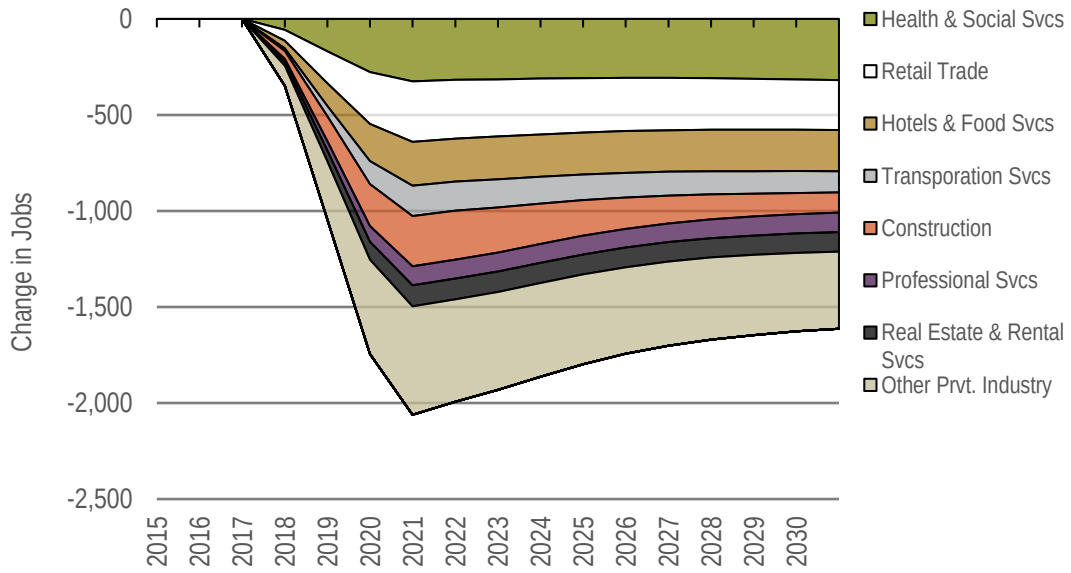
Figure 57. Government Employment Changes from the Projected Baseline in the MSB



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

Figure 58 breaks out employment impacts for the top seven sectors within Private Industry in the MOA (shown in aggregate in Figure 52). An eighth group "Other private industry", in beige, represents an aggregate of industries not specifically listed. All of these private sector employment effects are considered induced impacts in the Alaska REMI model. In 2020, health care and retail trade will be the most heavily impacted sectors, losing just over 300 jobs each relative to the forecasted baseline. Construction is estimated to lose 261 jobs while the Alaska REMI model estimates negative job impacts of around 228 in hotel and food services, and 158 in transportation and warehousing in 2020. Real estate, and professional services report roughly 100 fewer jobs by 2020 each. As mentioned before, job impacts from the reduction, in terms of private employment in Anchorage, are forecast to become smaller in magnitude by 2030. This trend is apparent in all reported sectors, but stronger in construction and other private industry.

Figure 58. Anchorage Private Employment Changes from Projected Baseline



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Impacts to private sector employment in the MSB, as shown in Figure 59, vary in comparison to the MOA in both the top seven selected sectors, and in the magnitudes of change. In 2020, estimates show retail to be the heaviest affected, losing 64 jobs compared to the baseline. Retail is followed by other services, losing 62 positions; construction is estimated to reduce 57 jobs; health and social services loses 53 jobs; hotels and food services loses 31 jobs; and professional services, leisure and recreation, and real estate services are each reported to lose 10 to 20 jobs over forecasted baselines.

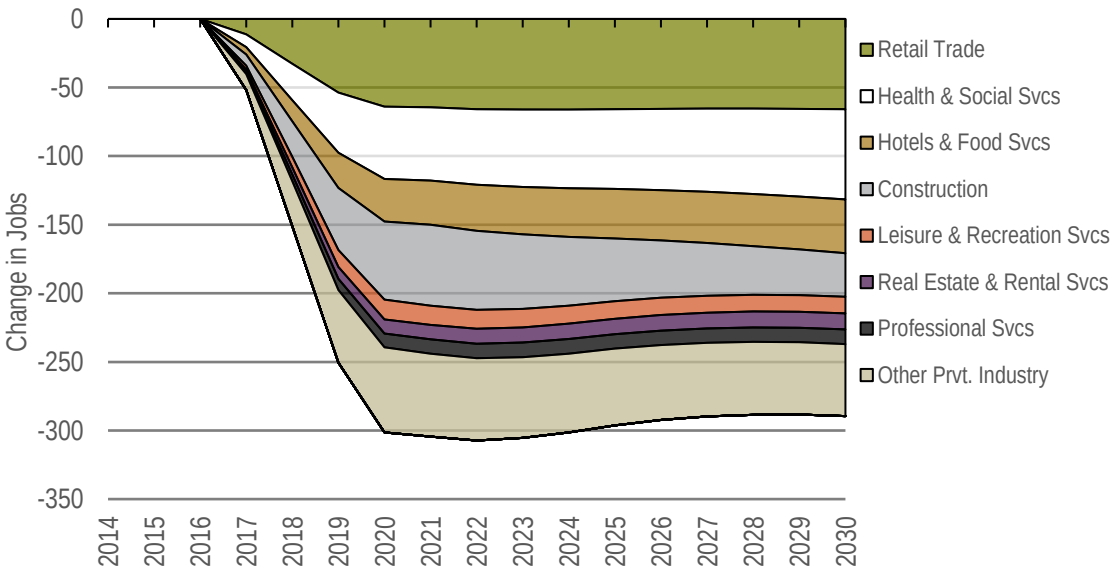
Some industries in the MSB have higher forecasted impacts in 2030, such as healthcare, while others such as construction, begin to recover by 2030. With no direct military employment, and the fact that nearly half of the MSB persons who have jobs commute to Anchorage for work (Kalytiak, 2012),[20] it is reasonable and expected that the industries most affected by a persistent employment loss in the MSB are related to personal consumption and services conveniently accessible to residential areas where military might live, such as shopping centers, restaurants and healthcare. Most of the private industry

[20] MSB residents that work in the MOA are considered part of MOA employment and are not part of MSB employment counts

sectors are projected to experience employment declines of greater magnitude as years pass. The exception to this appears to be the construction sector, which is likely to become less impacted in the long run.

Some sectors, including retail and food services, transportation, and professional services, are discussed in more detail in Section 5.

Figure 59. MSB Private Employment Changes from Projected Baseline

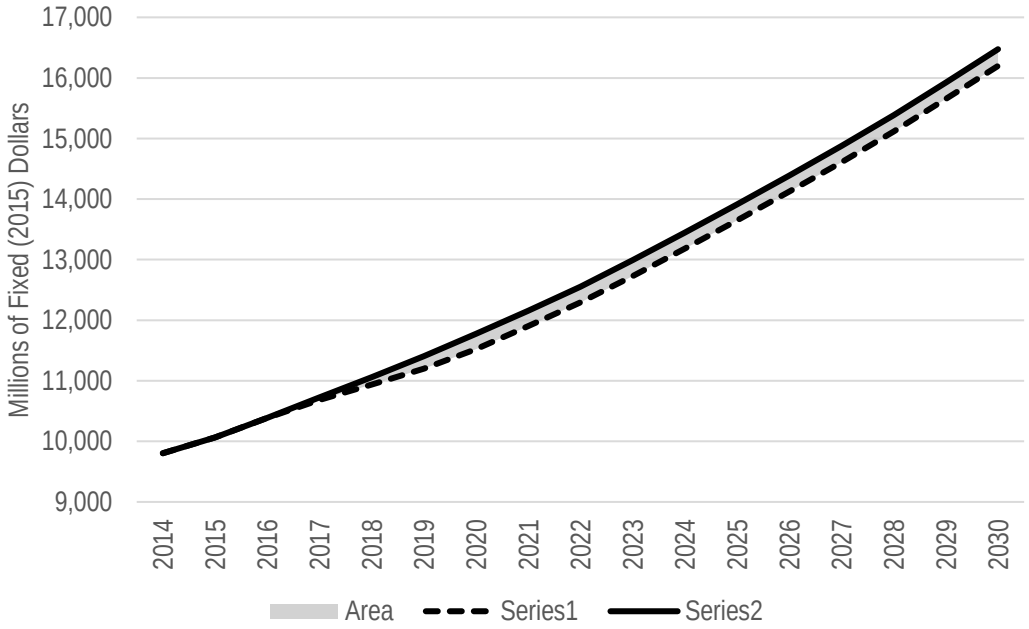


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

4.2.1 Impacts on Government and Private Sector Wages and Salaries

Wages and salaries are expected to decline by $255 million annually by 2020 and reduce by another $276 million by the year 2030 (Figure 60). It is again important to mention that this is relative to the baseline; even with the force reduction impacts, MOA and MSB wages and salary will continue to increase steadily into the foreseeable future, holding all other factors constant.

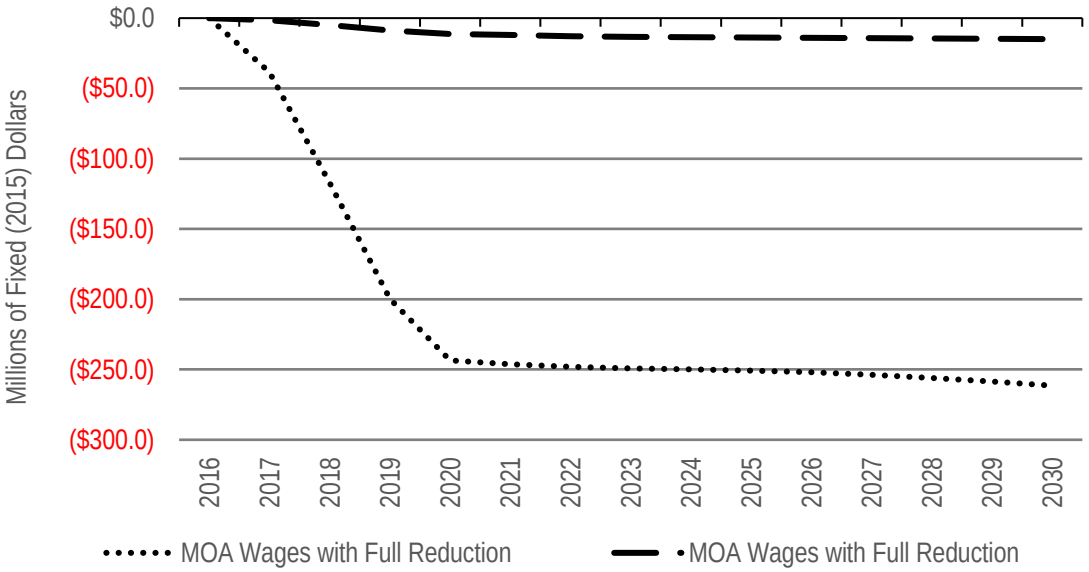
Figure 60. MOA and MSB Wages and Salaries Forecast and Without Force Reduction



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

In the MOA specifically, wage and salary losses amount to $243 million in 2020 and increase to $261 million by 2030 (Figure 61). Like employment, wage and salary impacts in the MSB are substantially smaller than in the MOA. MSB estimated annual losses amount to $11.1 to $14.1 million from 2020 to 2030.

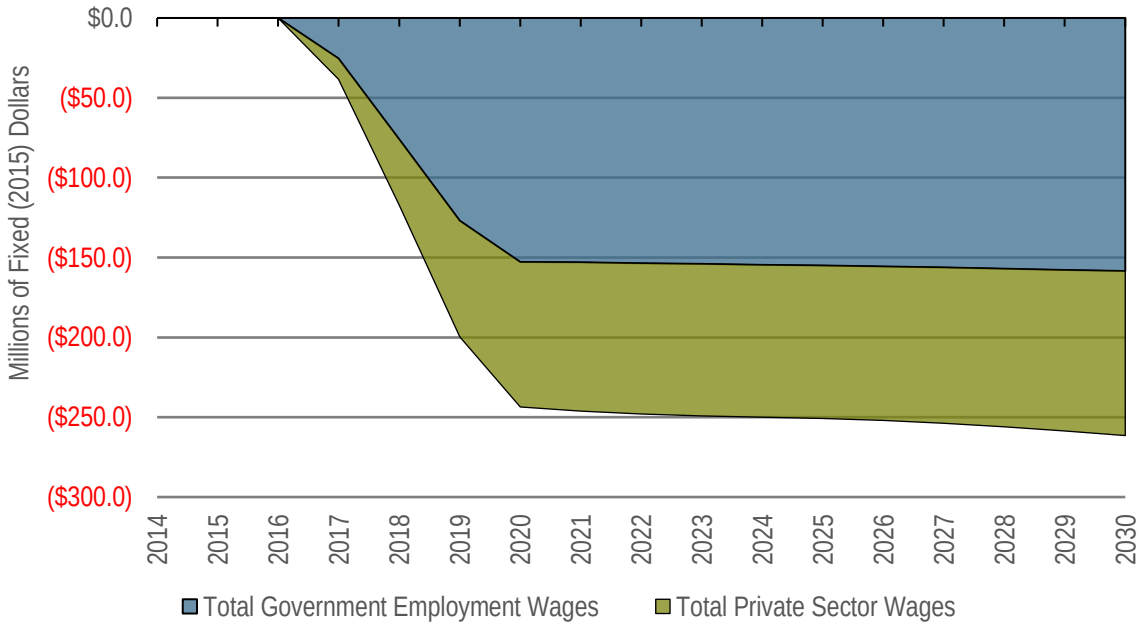
Figure 61. Changes in Wages and Salaries from Baseline Forecasts under Two Force Reduction Options



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

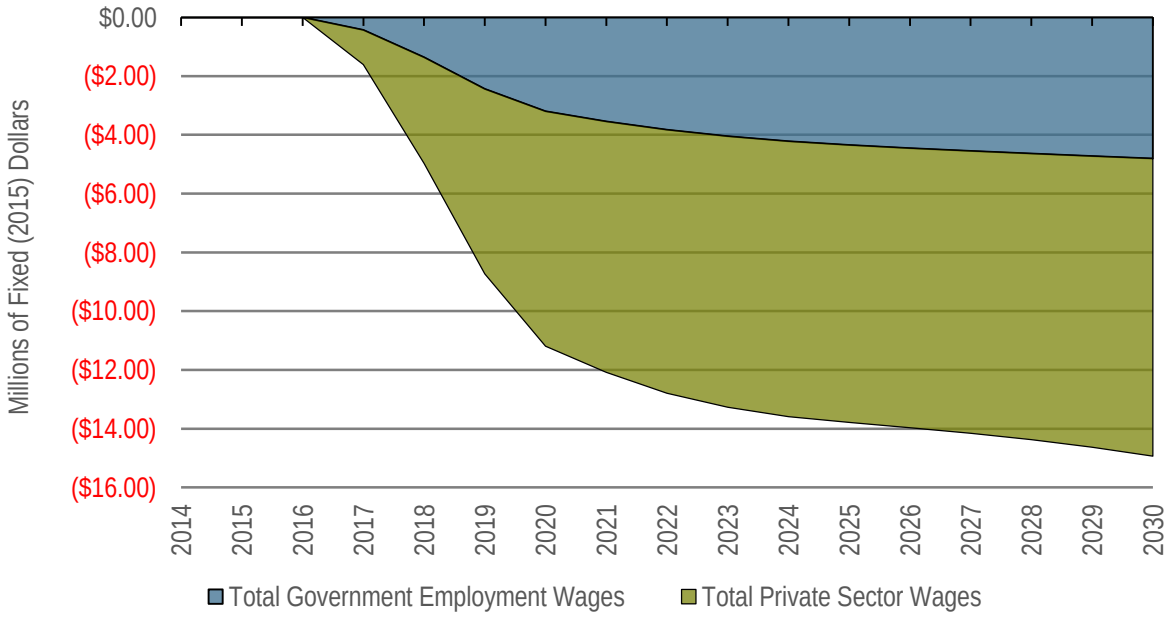
Figure 62 shows the split between Government and Private Industry wage and salary impacts in the MOA. Government wages are projected to decline by $158.5 million by 2030, while private sector wages are projected to decline by $103million. Government and Private Industry wage impacts in the MSB are presented in Figure 63. Total wages in the MSB are also projected to decrease by $14.6 million by 2030 compared to the baseline projections, with a decline of $9.9 million for the private sector and $4.7 million for the government sector. As was the case with the employment figures, the wage impacts in the MSB are all induced because the direct reductions only accrue to the MOA.

Figure 62. Projected Change in Private Sector and Government Wages and Salaries in the MOA



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 63. Projected Change in Private Sector and Government Wages and Salaries in the MSB



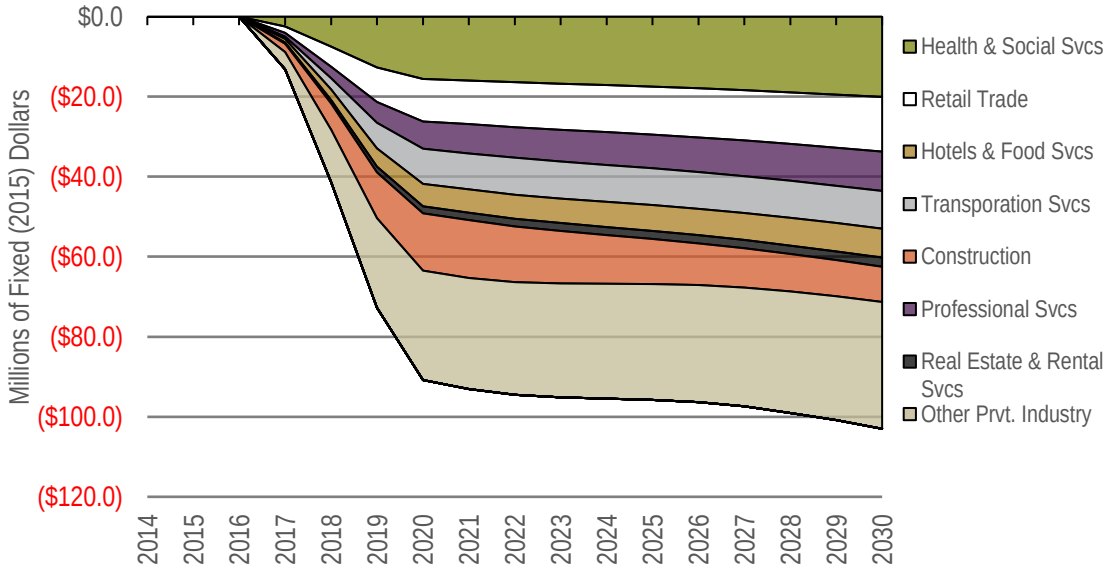
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 64 shows projected salary and wage impacts in the private sector by industry in the MOA. In 2020, health care and social services are estimated to lose some $15 million in wages and salary, which are the highest impacts of all specifically reported private sectors. Construction wages are projected to decline $14.3 million, followed by retail, showing declines of around $10 million. Transportation and warehousing is estimated to lose $8.8 million, while professional services and hotels and food service are projected to lose roughly $6 million each. The real estate sector is estimated to lose $1.8 million. All other industries not explicitly mentioned above make up the remainder of private wage impacts of $27.4 million.

It is interesting to note that impacts to MOA wages in the private sector (Figure 64) do not mirror job impacts from Figure 58 in rank or magnitude precisely. This is because some sectors, such as professional services and construction, represent much higher salaries per employed individual than sectors like retail and food service. This is especially true for professional services, which reported some of the smallest impacts in terms of job loss in 2030, but the third largest impacts of the reported sectors in terms of total lost wages and salaries in the same time period.

With the exception of the construction sector, impacts to wages and salaries are projected to increases over time in the top sectors in the MOA, while impacts to job counts themselves are fairly flat or begin to recover. This is a function of built-in cost of living adjustments within the Alaska REMI model. For example, impacts to retail wages deepen from $10.6 million in 2020 to $13.7 million in 2030 while job impacts are reduced from 315 in 2020 to 259 in 2030 (see Figure 58). Likewise, health and social services projected wage impacts increase from $15.6 million in 2020, to $20.1 million in 2030 while job impacts stay fairly constant in the same time period.

Figure 64. MOA Private Sector Changes from Projected Baseline in Wages and Salaries

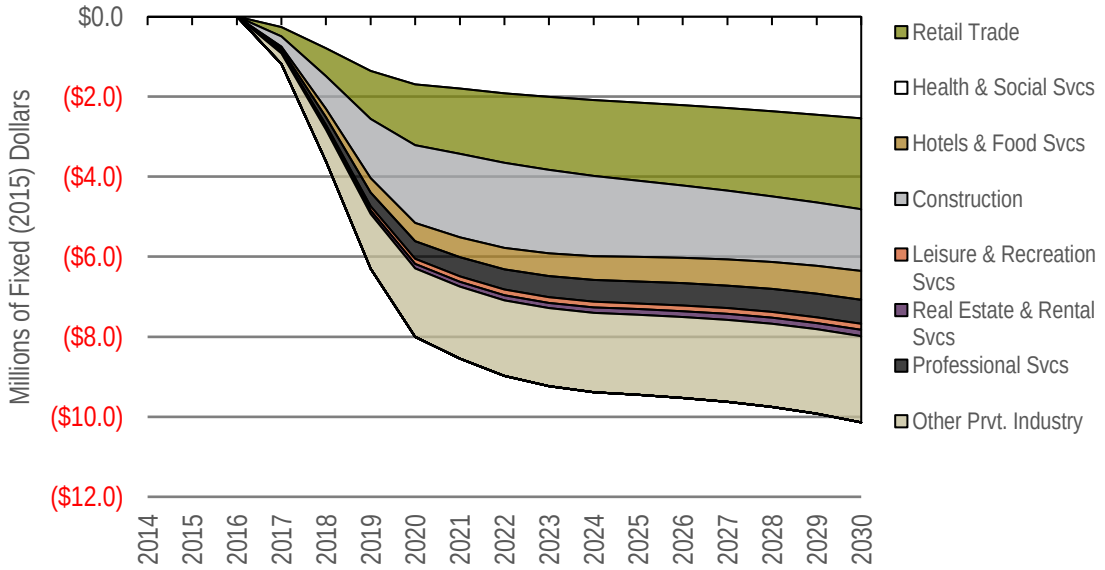


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

While impacts to the MOA and the MSB are displayed separately here, it is important to note the obvious links between the two economies. The MSB has no direct military employment; therefore, the vast majority of impacts in wages are induced and result from spending reduction by MSB residents. Figure 65 shows the forecasted indirect and induced impacts on wages and salary in the MSB. Aside from "other private industries", the top three wage and salary impacts in 2020 in the MSB are health and social services, retail, and construction. Wage losses to the health care industry in 2020 total an estimated $1.7 million, the retail sector bears a loss of $1.5 million, and construction is estimated to lose $1.9 million.

As in the MOA, the magnitude of various industry impacts may be different in terms of jobs and wages. In the MSB this is especially true for hotel and food services. Although hotel and food service represents the third largest job loss in the MSB by 2030—predominately equal with health care and retail—the sector drops to fourth largest in terms of wage impacts.

Figure 65. MSB Private Sector Changes from Projected Baseline in Wages and Salaries

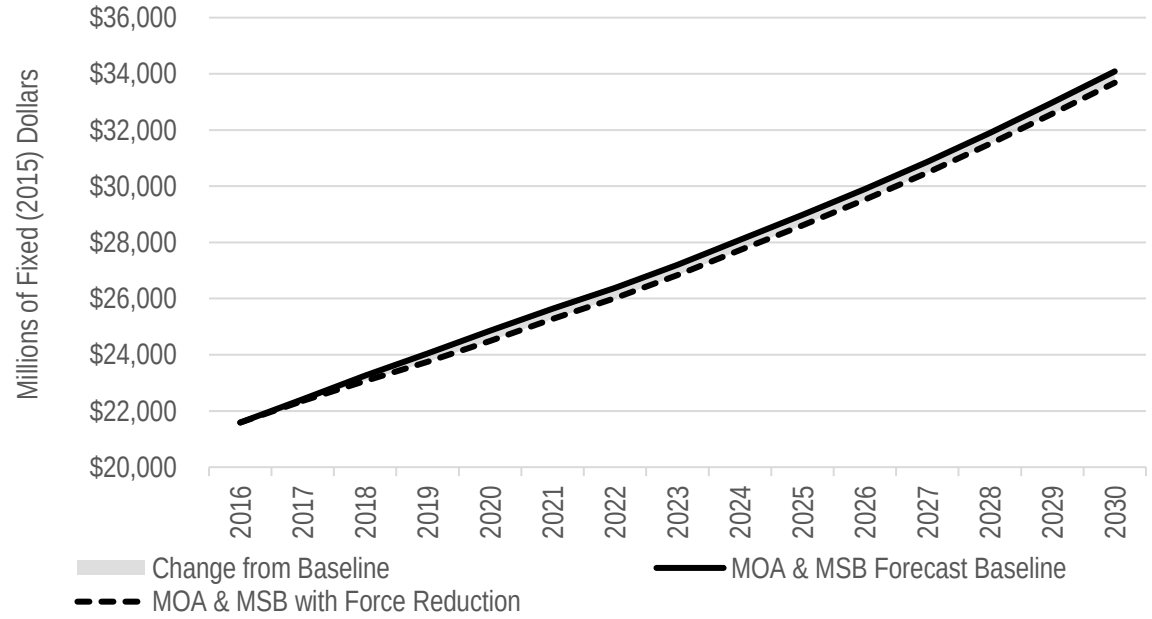


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

4.3 Consumption Impacts of the Proposed Force Reduction

By the year 2030, personal consumption in the MOA and the MSB is forecast to decline a total of $403 million relative to the Baseline Forecast as a result of the full proposed force reduction. While this over a quarter billion-dollar change is significant, it is important to put the decline in context. Figure 66 shows these forecasts for 2016–2030 for the MOA and MSB combined. Under the baseline forecast, personal consumption in the two-borough region is expected to increase from $21.5 billion in 2016 to $34 billion in 2030. With the proposed force reduction (which is assumed to begin in 2017), personal consumption continues to rise, but at a slightly slower pace. By 2020 (the first full year after the phase-in reduction), personal consumption is expected to have declined by $363 million. In the years that follow, the overall magnitude of the decline (relative to the baseline) gradually moves to a decrease of $403 million by 2030. In 2030, personal consumption with the force reduction is 1.2 percent lower than it would have been under the baseline forecast.

Figure 66. Personal Consumption in the MOA and MSB with and without Changes in Force Reduction



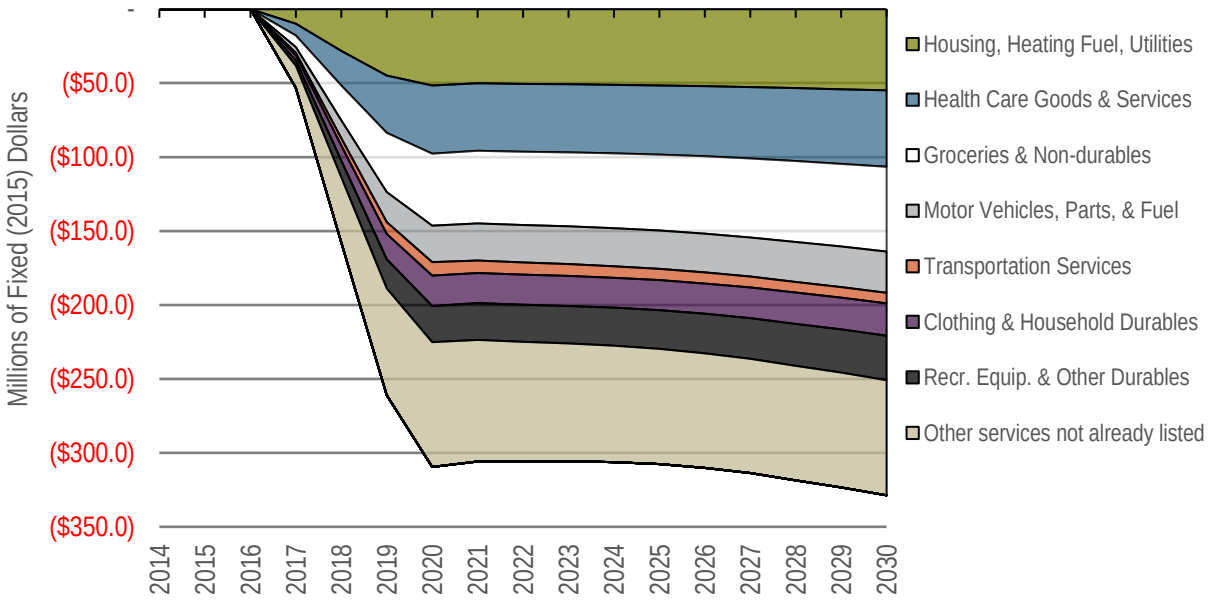
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model

The following two figures show the changes in forecasted personal consumption through 2030, with the full proposed force reduction, relative to the baseline, for the MOA (Figure 67Figure 67) and for the MSB (Figure 68).[21] The figures group spending into eight consumption categories. Declines in personal consumption, relative to the baseline, reach just over$300 million in the MOA in 2020, and increase slightly through 2030. Top consumption impact categories in the MOA in 2020 are housing, heating, and utilities ($51.6 million), healthcare ($46.2 million), and groceries ($48.6 million). In the MSB, declines do not flatten out after the phasing of the force reduction, reaching $55 million by 2020, and then continuing to decline relative to the baseline out to 2030. By 2030 the relative decline in personal consumption in the MSB reaches an estimated $75 million.

The differing patterns likely result from the fact that personal consumption is directly related to population and that the MOA is the primary source of population growth in the MSB. With direct population decline (as the number of military families is reduced) and ongoing reduction in military employment, there is less population overflow from the MOA to the MSB, not only during the phased reduction period but continuing through 2030. Because of these differences, MOA population and consumption changes begin to recover as a percent of the baseline, while MSB population and consumption impacts increase in magnitude.

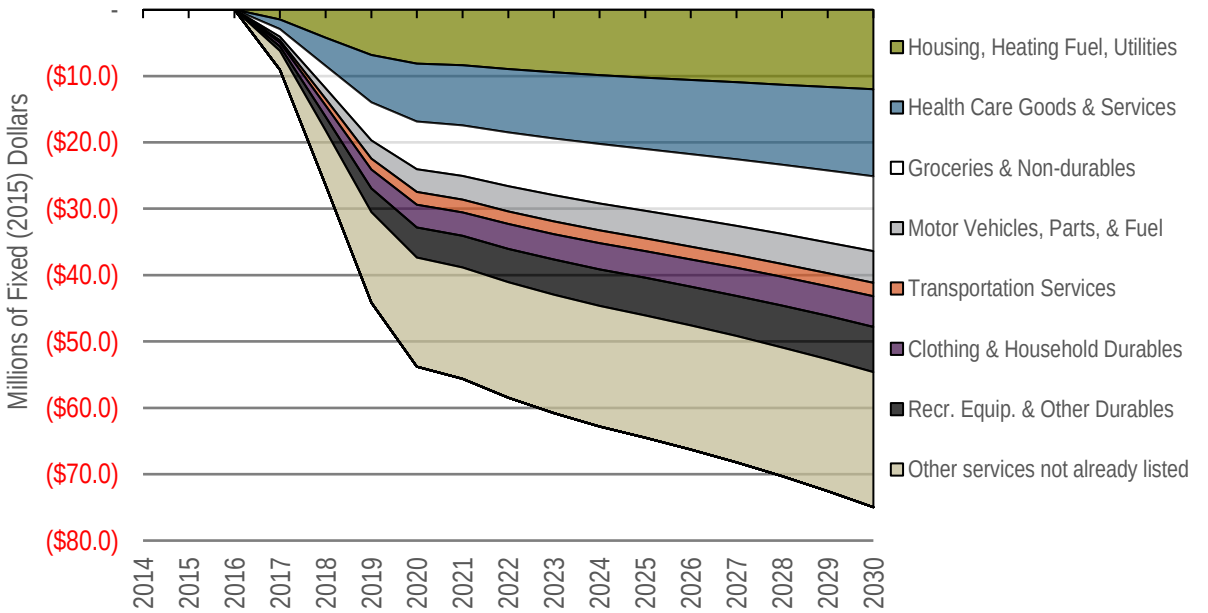
[21] By definition personal consumption reflects the household spending patterns of residents by their place of residence, regardless of the location at which purchase are made. In all cases, spending by non-residents and by businesses, governments, or other entities is not included.

Figure 67. Forecast Reductions in Personal Consumption in the MOA by Spending Category



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 68. Forecast Reductions in Personal Consumption in the MSB by Spending Category

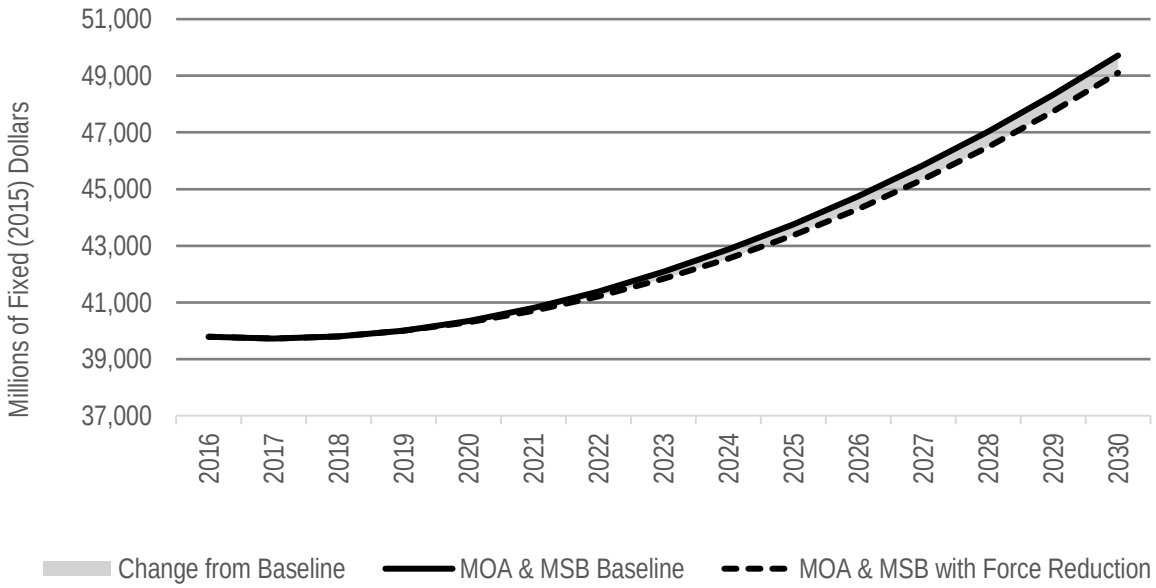


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

4.4 Housing Market Impacts of the Proposed Force Reduction

The reduction of the 4-25th ABCT is estimated to cause direct, indirect and induced effects in the real estate markets in both the MOA and the MSB. The military represents rental income to the economy as well real estate ownership. With the 4-25th reduction, landlords lose tenants, and housing stock previously owned by the military and their dependents is released to the real estate market. As a result, less housing stock is built, rental income drops, and housing prices decrease due to an upward supply shock and reduced demand. Like other economic indicators in the MOA and MSB, housing stock and rental income are generally increasing in baseline scenarios. Under the JBER force reduction scenario, housing stock (Figure 69) and rental income are still projected to increase, but at lower rates, as discussed below.

Figure 69. Capital Stock in the MOA and MSB with and without Changes to the Force Reduction

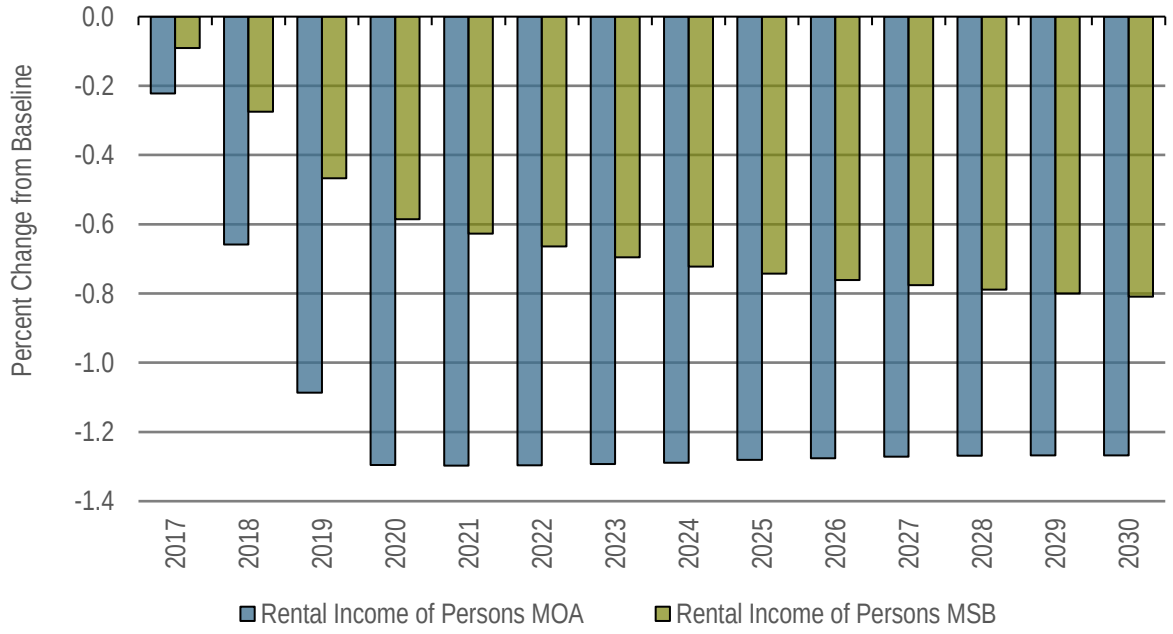


Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Housing stock as a whole in the MOA and MSB is estimated to reduce by $150 million in 2020, increasing to $553 million by 2030. When put in perspective, less housing as a result of the reduction amount to roughly 0.5 percent of projected housing in 2020. Since housing stock is projected to grow around 3.6 percent between 2016 and 2020 in the base case, the force reduction would mean a 3.1 percent growth instead, holding all else constant.

Figure 70 shows estimated impacts to rental income in the MOA and MSB in terms of percentage change from baseline. In Anchorage, rental income (a proxy for the size of the rental market) decreases an initial 1.3 percent by 2020, while rental income in the MSB shows negative impacts of nearly 0.6 percent. Between 2020 and 2030, impacts to the MOA remain fairly flat. MSB rental income impacts, however, slowly increase in severity over time. From 2020 to 2030, negative impacts to rental income go from 0.6 percent to 0.8 percent below baseline conditions.

Figure 70. Percent Change from Baseline in MOA and MSB Rental Income



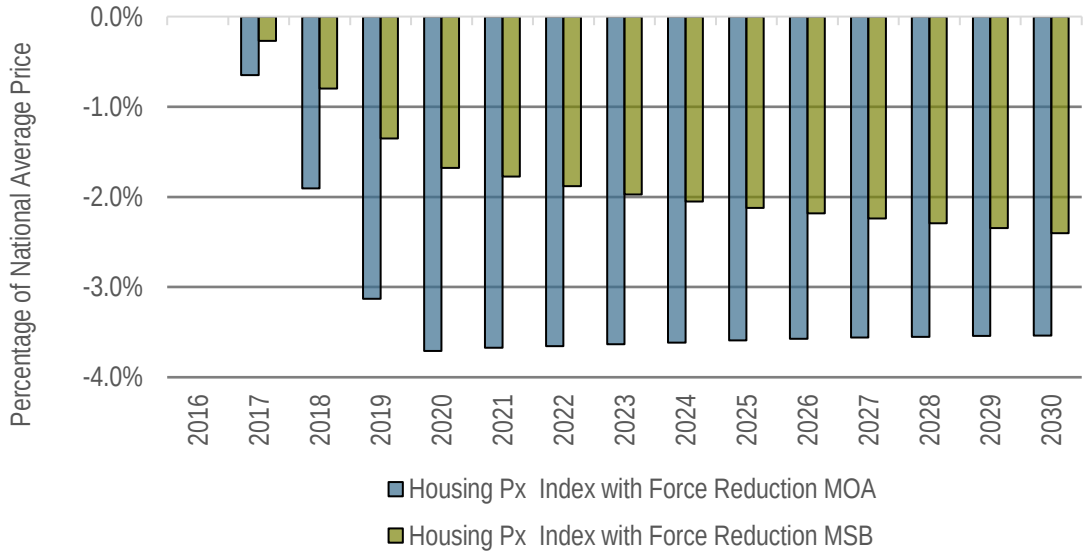
Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

As mentioned above, reducing the number of active duty military and their families from the Anchorage area will likely free up additional housing stock, or supply, as well as contribute to an overall loss in housing demand. The effects of this supply and demand shift are represented in Figure 71 in terms of housing prices. The housing price index shows the average price of houses relative to the average price of house in the U.S. as a whole. From 2017–2020, housing prices in Anchorage are projected to drop roughly 1 percentage point per year until they are just under 4 percent below baseline conditions in 2020. Changes in housing prices are expected to remain flat at 3-4 percent below baseline conditions through 2030. Baseline prices in Anchorage, relative to the national average, are projected to remain flat with or without the proposed reduction.

The proposed force reduction in the 4-25th is projected to reduce housing prices in the MSB by 1.6 percentage points in 2020, and by 2.2 percentage points in 2030, relative to the baseline. It is clear that rental income and housing price impacts, as a result of a 4-25th reduction, largely follow population impacts in the MOA and MSB discussed above in section 4.1.1. While the MSB and the MOA both incur negative housing effects in terms of rental income and prices in the short run, the MSB continues to realize negative impacts as population pressure from Anchorage and housing demand are curbed into the future.

See Section 5.2 for a more detailed discussion on estimated impacts on housing types and geographic location.

Figure 71. Percentage Point Change from National Average Housing Prices



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

5 Quantitative Impacts to Individual Components of the Affected Region

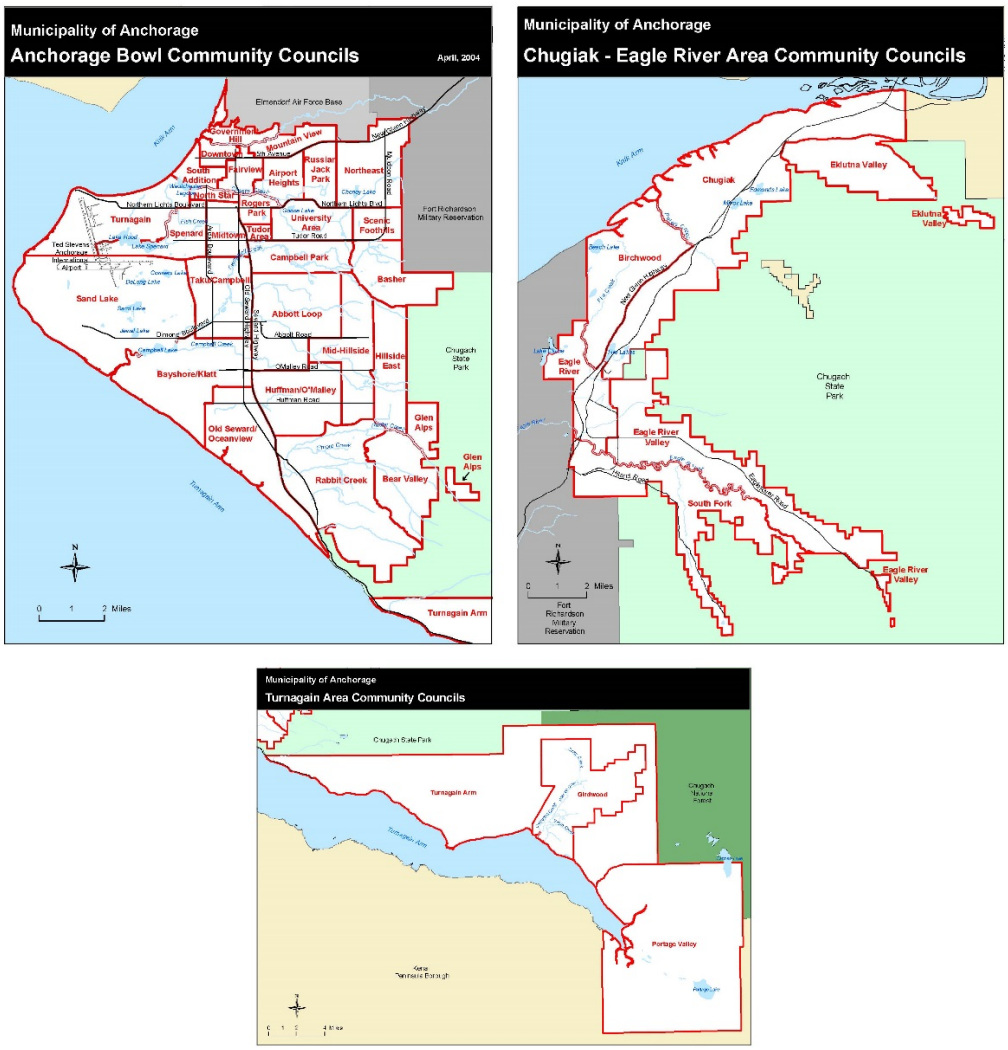
Various sectors affected by the military in Anchorage and the Mat-Su were specifically chosen for a more detailed analysis and discussion. Sector selection for this chapter was largely based on public comment, stakeholder focus groups, and key informant interview feedback, along with suggestions from the BEAR Working Group. In general, we find that the public are genuinely concerned about community impacts, housing, schools and retail in the face of a reduction. Key informants revealed mixed opinions regarding their specific sectors. Some, such as moving and storage, indicated heavy military involvement, and a loss to the industry if personnel numbers were to reduce. Others, such as electric utilities, indicated less exposure to the reduction, or having mitigating measures in place.

This chapter is arranged by sector in such a way that the public, key stakeholders, and policy makers alike may identify information relevant to their specific interests. Topics, in order of appearance, include community impacts, housing, retail, public schools, utilities, transportation moving and storage, and native corps and other contracts. We begin each section by presenting or reiterating any REMI results specific to the industry or sector, followed by a detailed description of military connection and any direct impacts calculated aside from REMI as a result of a 4-25th force reduction. Where possible, geographical specificity is offered through GIS analysis.

5.1 Community and Community Council Population Impacts

Military families have important roles in the community through volunteering, fulfilling public roles, and providing a certain amount of stability. While there are many different definitions of communities, one way they can be defined in Anchorage is through community councils. The Federation of Community Councils was formed in 1976 to provide support, technical assistance and ensure self-determination to the 38 different communities in the MOA that it represents (See Figure 72) (Federation of Community Councils 2016). Each council represents a self-governing body made up of residents and business owners who meet periodically to discuss, craft, and vote on local actions.

Figure 72. Municipality of Anchorage Community Councils



Source: MOA (2004)

Table 13, on the following page, gives a breakdown of MOA population by community council. Using Census Data (2016a) at the block level, spatially joined to community council boundaries in GIS, we see that the Northeast district contains the largest total population of 90,275, with the Northeast community council itself containing 31,000 people within its boundary. Northeast and Northwest districts contain approximately 49,000 people each, with Spenard and Abbot Loop containing 12,321 and 24,249 people respectively. The Southwest district contains 56,669 people with 24,003 residing in Sand Lake. The Eagle River Chugiak area contains some 34,235 people in its boundaries, with Eagle River and Eagle River Valley community councils containing over 22,000 of the Eagle River Chugiak population.

Table 13. Anchorage Community Level Military Demographics

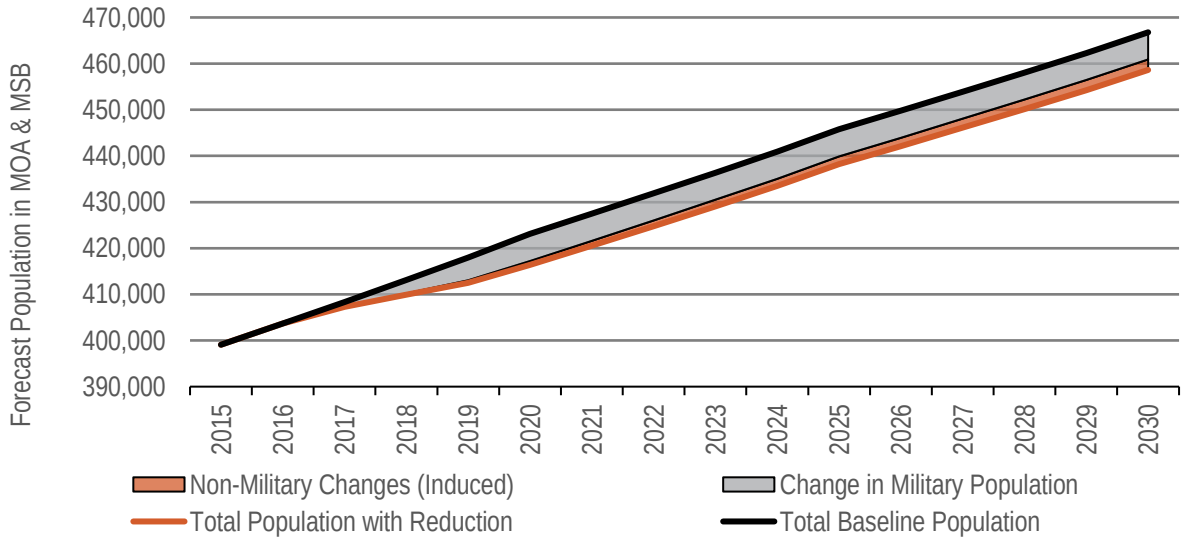
Community Council	Total Population	Current Active Duty Estimate
Eagle River Chugiak	**34,235**	**1,180**
Birchwood	2,156	29
Chugiak	7,993	137
Eagle River	10,923	402
Eagle River Valley	11,386	567
Eklutna Valley	78	0
South Fork	1,699	45
Northeast	**90,275**	**1,224**
Airport Heights	6,215	54
Basher	406	2
Campbell Park	8,312	105
Mountain View	7,832	42
Northeast	31,021	544
Rogers Park	3,494	22
Russian Jack Park	11,730	155
Scenic Foothills	9,181	164
Tudor Area	1,887	9
University Area	10,197	125
Northwest	**49,096**	**331**
Downtown	1,571	18
Fairview	8,487	71
Government Hill	3,194	27
Midtown	4,489	29
North Star	3,416	21
South Addition	4,481	36
Spenard	12,321	63
Turnagain	11,137	66
Southeast	**48,837**	**320**
Abbott Loop	24,249	199
Bear Valley	670	2
Glen Alps	287	0
Hillside East	2,204	9
Huffman/O'Malley	10,859	54
Mid-Hillside	4,355	27
Rabbit Creek	6,213	29
Southwest	**56,669**	**394**
Bayshore/Klatt	12,448	92
Old Seward/Oceanview	7,493	45
Sand Lake	24,003	167
Taku/Campbell	12,725	90
Turnagain Arm	**2,579**	**6**
Girdwood	1,827	6
Portage Valley	17	0
Turnagain Arm	735	0

Source: Northern Economics using Data from the U.S. Census Bureau (2016a), MOA Assessor (Schlosstein, 2016) the PFD (MOA, 2016b) and the DOD (USARAK, 2016).

5.1.1 Community Population Impacts

Direct population impacts (soldiers and their dependents), represented in grey in Figure 73, are likely to occur in communities with already high existing military counts. Some area impacts may be intuitive based on their proximity to JBER, such as Northeast Anchorage and Eagle River, while others may be overlooked if not examined more closely. Induced population impacts (such as non-military workers in supporting industries), represented in orange in Figure 73, may be less intuitively located and, barring further analysis, should be assumed equally dispersed across the MOA and the MSB.

Figure 73. MOA & MSB Population Forecasts with Changes in Military Population and Other Induced Changes



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

To give a sense of relative military involvement in specific Anchorage neighborhoods, we estimated active duty residence by council. Using geocoded PFD applications (see section 1.2.4), the project team spatially joined locations of active duty application points to community council boundaries and calculated the number of applications in each as a percent of the total. We finally multiplied best known figures for active duty personnel living off base[22] by the share each council represents to arrive at active duty military per council.

As shown in Table 13 above, the Northeast region is estimated to currently contain the highest number of active duty personnel (1,180), the majority of whom reside in the Northeast and Scenic Foothills councils. The Eagle River Chugiak area contains some 1,180 active duty members with over 900 residing in Eagle River and Eagle River Valley. Although total military estimates are higher in Northeast Anchorage than in Eagle River Chugiak, it is important to note that the Northeast's population is almost 3 times larger. The northwest region reports 331 active duty. Southeast and Southwest regions contain an estimated 320 and 394 active duty members respectively, many of whom reside in Abbot Loop and

[22] Using data from the JBER fact sheet (PACAF, 2016b), adjusted for USARAK information (USARAK, 2016), off-base active duty military equals 4,254 solders, 3,449 of which are estimated to live in Anchorage. This number does not include dependents and is inclusive of the entire Army and Airforce assigned to JBER

Sand Lake community councils. Girdwood, in the Turnagain Arm, contains negligible levels of active duty according to our estimates.

A similar calculation was made for the MSB to estimate active duty military by community. The MSB does not contain formal community councils; therefore, Census Designated Places (CDPs) were used to characterize some top communities by population. Table 14 shows an estimated 260 active duty soldiers reside in Knik-Fairview CDP, 147 in Lakes CDP and 127 in Gateway CDP. The figure which also shows total population indicates that the Knik-Fairview CDP has the largest total population of any city or CDP in the MSB with a total of 14,923; the Lakes CDP is second with 5,552. The cities of Wasilla and Palmer contain 7,831 and 5,937 people respectively, and 5,552 reside in Gateway CDP.

Table 14. MSB Community Level Military Demographics

Community Council	Total Population	Current Active Duty Estimate
MatSu (Select)	48,360	799
Butte CDP	3,246	46
Farm Loop CDP	1,028	10
Gateway CDP	5,552	127
Knik-Fairview CDP	14,923	260
Lakes CDP	8,364	147
Lazy Mountain CDP	1,479	15
Palmer city	5,937	82
Wasilla city	7,831	113

Source: Northern Economics using Data from the U.S. Census Bureau (2016a), MOA Assessor (Schlosstein, 2016) the PFD (MOA, 2016b) and the DOD (USARAK, 2016).

5.2 Housing

On-Base Housing

Housing on base at JBER is comprised of unaccompanied housing or "barracks" and privatized accompanied housing owned by Aurora Military Housing, an affiliate of JL Properties (hereafter referred to as "Aurora"). The barracks at JBER have a capacity of 3,585 soldiers, and were at 72 percent capacity between Army and Airforce personnel as of January of 2016 (PACAF, 2016b). Recently renovated in 2014, the barracks at JBER generally offer two bedroom units with a bathroom and kitchenette (ADN, 2014).

The 3,262 accompanied housing units on base at JBER, all of which are owned by Aurora, were built or renovated in three phases from 2003 to 2014 at a cost of roughly $600 million. Fifty-five percent of the on-base privatized housing is new construction, with dwellings that include two, three, four, and five bedroom homes along with duplexes, four-plexes and six-plexes. During deployments, Aurora also provides amenities to remaining JBER tenants such as snow removal, yard care and general maintenance (Germer, 2016). At the time of this report, the waiting list for on-base housing, as reported by Aurora, totaled 291 soldiers (Aurora Military Housing, 2016).

Aurora's privatized on-base housing is a result of the 1996 Military Housing Privatization Initiative, which allows for the DOD to competitively bid out housing and alleviate traditional issues including overcrowding and aging facilities (ODUSDIE, 2016). Privatized housing can offer attractive investment opportunities for the successful bidder beyond traditional rental properties. Military tenants pay with a monthly basic allowance for housing (BAH), which insures timely, reliable payment. Further, privatized

housing is under a 50-year contract with various contractual assurances against base closures and personnel reductions. One assurance, known as the "waterfall", allows Aurora to open on-base housing to other, more general populations should their occupancy drop below 95 percent (Germer, 2016). The type of occupant allowed depends on the persistency of vacancies, and is as follows:

- Below 95 percent for over 30 days – open to civil service, retired military, ret. civil service
- Below 95 percent for over 60 days – open to DOD contractors
- Below 95 percent for over 90 days – open to general public

While Aurora has never had to work down the waterfall and rent to tenants other than active duty military, the waterfall policy is significant in that on-base housing is not isolated from the greater Anchorage Mat-Su housing market. Drawn to its full conclusion, if Aurora is able to offer more attractive housing options than generally found off-base, Anchorage and Mat-Su off-base housing markets could bear the entirety of a 4-25th reduction as military and non-military move in to fill on-base vacancy.

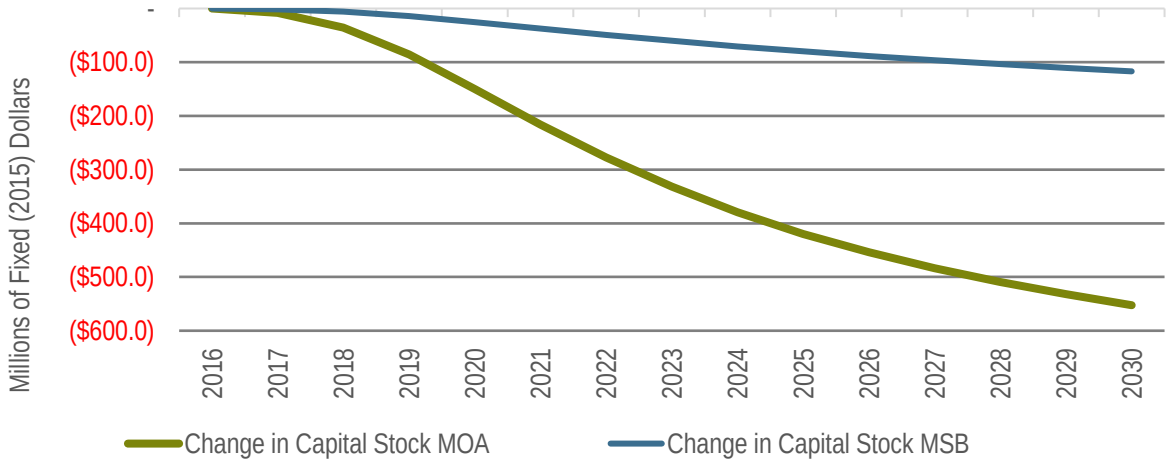
Off Base Housing

In Anchorage and the MSB, active duty military receive a housing allowance for living off base ranging from $1,299–$2,892 depending on rank. This assured housing income makes up a substantial portion of compensation to soldiers and contributes to the estimated impacts to the housing sector.

Through direct and induced impacts modelled in the Alaska REMI Model simulations, rental incomes are expected to drop 1.3 percent in Anchorage and 0.6 percent in the MSB as a result of the reduction by 2020. Further, housing prices will decline an estimated 4 and 1.6 percentage points in Anchorage and the MSB respectively compared to the national average. These impacts were discussed earlier in Section 4.4, starting on page 84.

Negative impacts to **residential** capital stock (hereafter referred to as capital stock) are also estimated to occur in both Anchorage and the MSB as a result of the reduction. As shown in Figure 74, MOA and MSB capital stock impacts, in relation to their respective baselines, show a $150 million decrease by 2020 in the MOA along with a $25.5 million decrease in the MSB. By 3030 the MOA is expected to have lost some $552.5 million in capital stock relative to its baseline, while the MSB shows negative impacts of $117.1 million in 2030.

Figure 74. Changes in Residential Capital Stock in Anchorage and the MSB



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

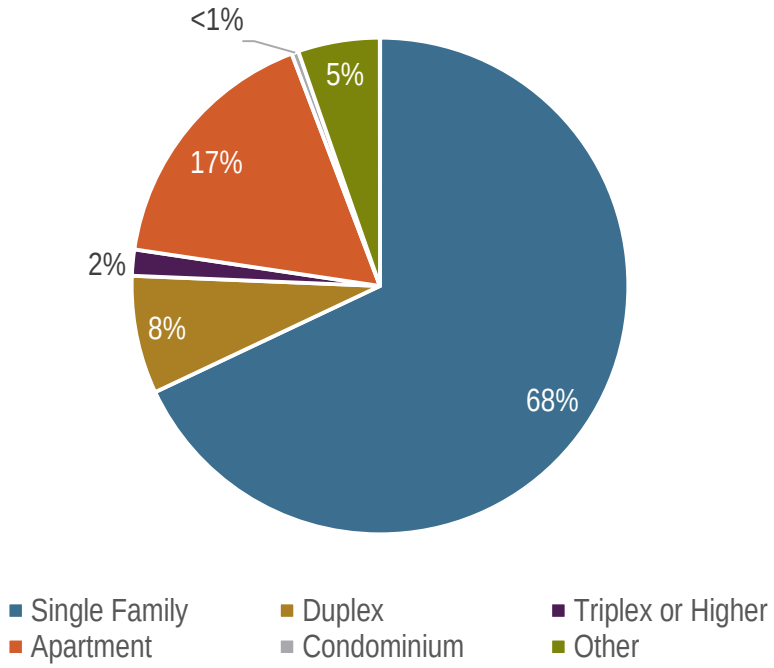
Through techniques developed by the study team, direct housing stock impacts related to the military and their families, can be isolated, and detailed with respect to location and housing type. Using 2016 JBER Installation Fact Sheet (PACAF, 2016b) adjusted for ancillary information provided by the USARAK (USARAK, 2016), the project team estimates that 4,254 active duty military currently live off base, 3,455 of whom reside in the MOA and 799 in the MSB. Off-base housing information was further derived through the use of PFD applicant information and assessor's parcel data from the MOA and MSB. PFD data, cleaned and sorted for active duty military, were joined[23] with parcel data where possible to determine location and housing type. Owner-occupied status was determined by a positive match between the last names of an active duty PFD applicant and the owner of the joined parcel. It is important to note here that only a fraction of active duty military apply for their PFD each year. Therefore, this and other subsequent analysis in this report leveraging PFD data, are statistical inferences made from sample data, rather than "actual" data.

Figure 75 and Figure 76 provide results of the analysis in terms of active duty military's off-base housing preferences in the MOA and MSB. As seen in Figure 75, 68 percent and 17 percent of Anchorage's active duty military reside in single family homes and apartments respectively. The remainder is split between duplexes, triplexes, condominiums and other types of housing.[24] In contrast, Figure 76 shows that, among active duty residents of the MSB, 89 percent reside in single family housing.

[23] Table joins were used where possible. Remaining unmatched record were geocoded and spatially joined to the nearest parcel.

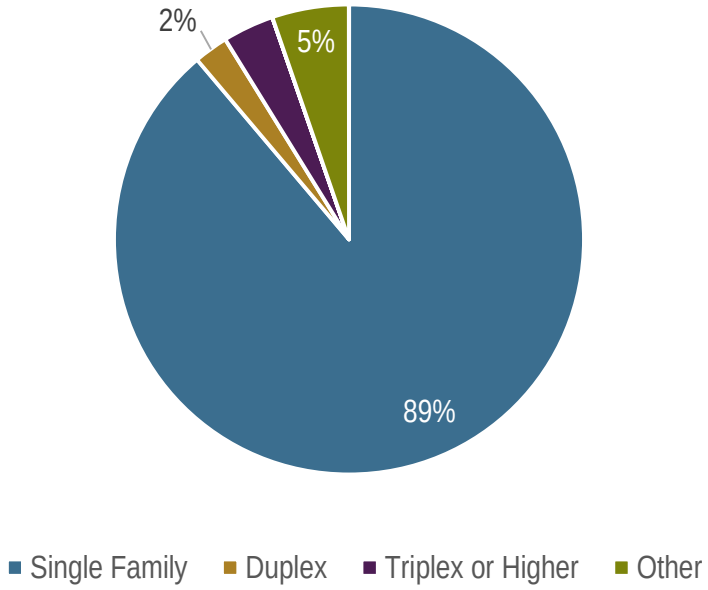
[24] Other category largely includes mobile homes, blank housing types and clearly erroneous data.

Figure 75. Anchorage Off-Base Military Housing Preferences



Note: Represents the percent of total active duty military in Anchorage.
Source: Northern Economics using data from the MOA (Schlosstein, 2016) the Permanent Fund Dividend (MOA, 2016b) and USARAK (2016).

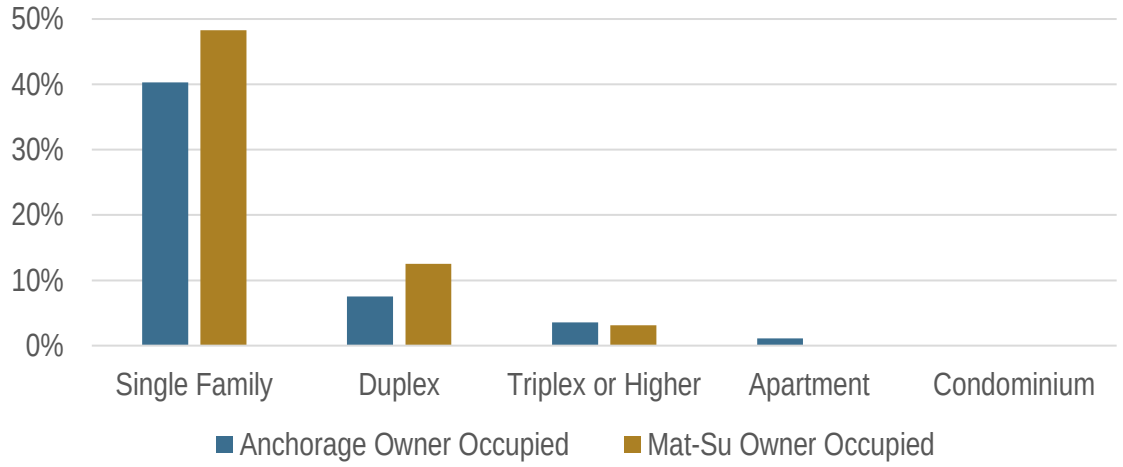
Figure 76. MSB Off-Base Military Housing Preferences



Note: Represents the percent of total active duty military in the MSB.
Source: Northern Economics using data from the MOA (Schlosstein, 2016) the Permanent Fund Dividend (MOA, 2016b) and USARAK (2016).

Housing ownership rates among active duty also tend to differ between the MOA and MSB. Highlighted in Figure 77, single family ownership in Anchorage (in blue) is estimated to be 40 percent, while single family ownership in the MSB is closer to 50 percent.[25] Duplexes also have a higher owner occupied percentage in the Mat-Su than in anchorage while triplexes and greater are roughly equal. For comparison, the U.S. Census estimates owner occupied housing for the MOA as a whole is 58 percent, and owner occupied housing in the MSB is 77 percent (U.S. Census Borough, 2016b).

Figure 77. Military Owner Occupied Housing by Type



Source: Northern Economics using data from the MOA (Schlosstein, 2016) the Permanent Fund Dividend (MOA, 2016b) and the DOD (USARAK, 2016).

In the same way direct population impacts are likely to affect targeted communities (See Chapter 5.1.1), off-base housing preferences for active duty military are not geographically uniform across the study area. Access to the base is restricted to five entrances (and one exit-only gate), most of which can be reached in the shortest amount of time from northeast Anchorage, northwest Anchorage, and Eagle River.

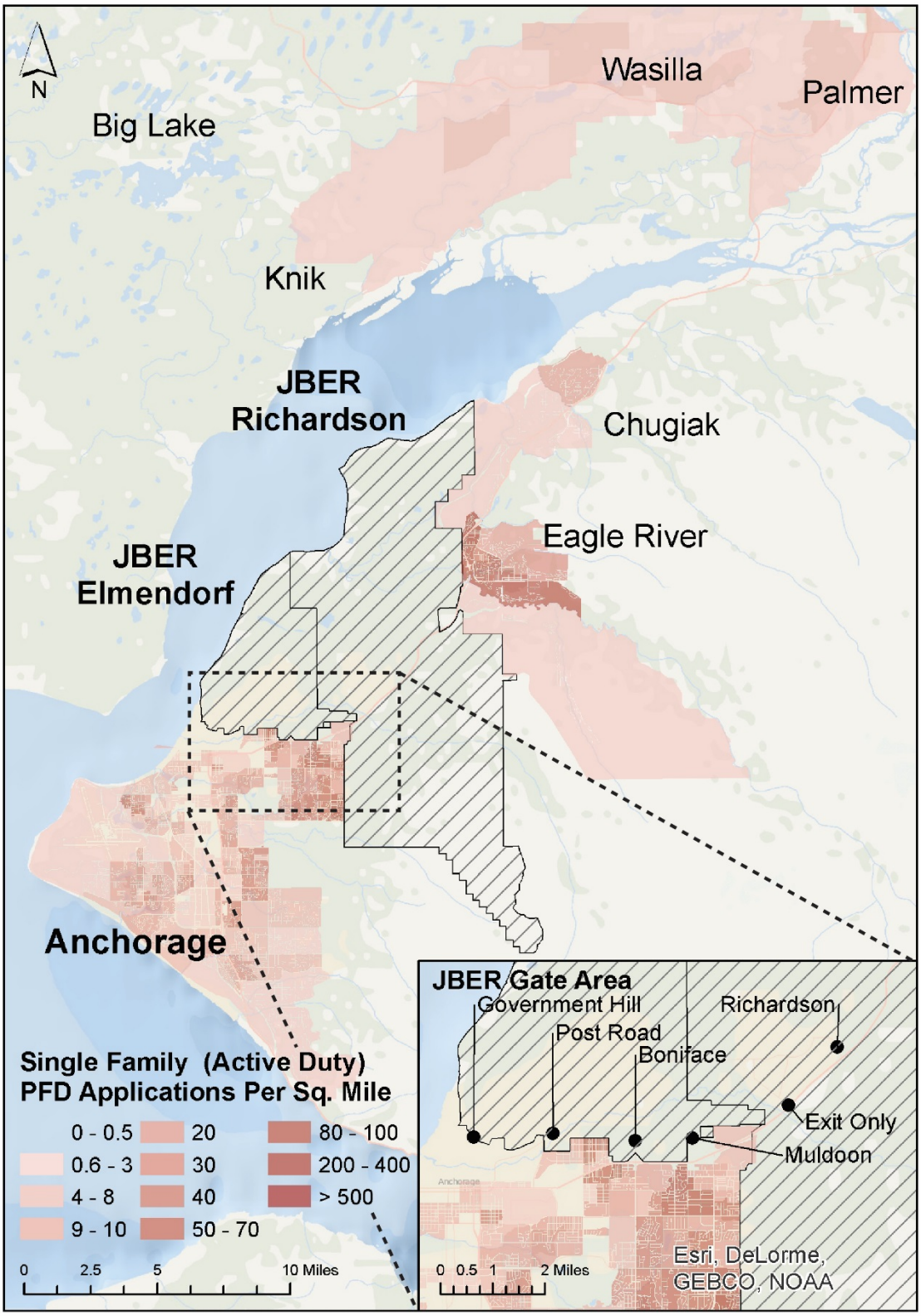
As shown in Figure 78 and Figure 79, locational preference also depends on housing type. Figure 78 shows single family active duty PFD applications per square mile by census block.[26] The figure also provides a callout box highlighting northeast anchorage area where JBER gates are located. The map reflects a heavy presence of single family military in Eagle River to the northeast of JBER and southern portions of northeast Anchorage. The Palmer Wasilla area also shows a consistent coverage of single family PFD applications.

Figure 79 reveals a different picture in regard to multi-family homes (duplexes, triplexes, apartments, and condos) associated with active duty military. Multi-family housing tends to cluster in northeast Anchorage and midtown with some non-single family density in Eagle River. Conversely, there is very little non-single family housing reported in southeast and southwest Anchorage. Further, the Palmer Wasilla region shows very little non-single family housing in comparison to single family preferences.

[25] Active duty ownership estimates should be considered conservative due to name discrepancies between PFD and assessor data.

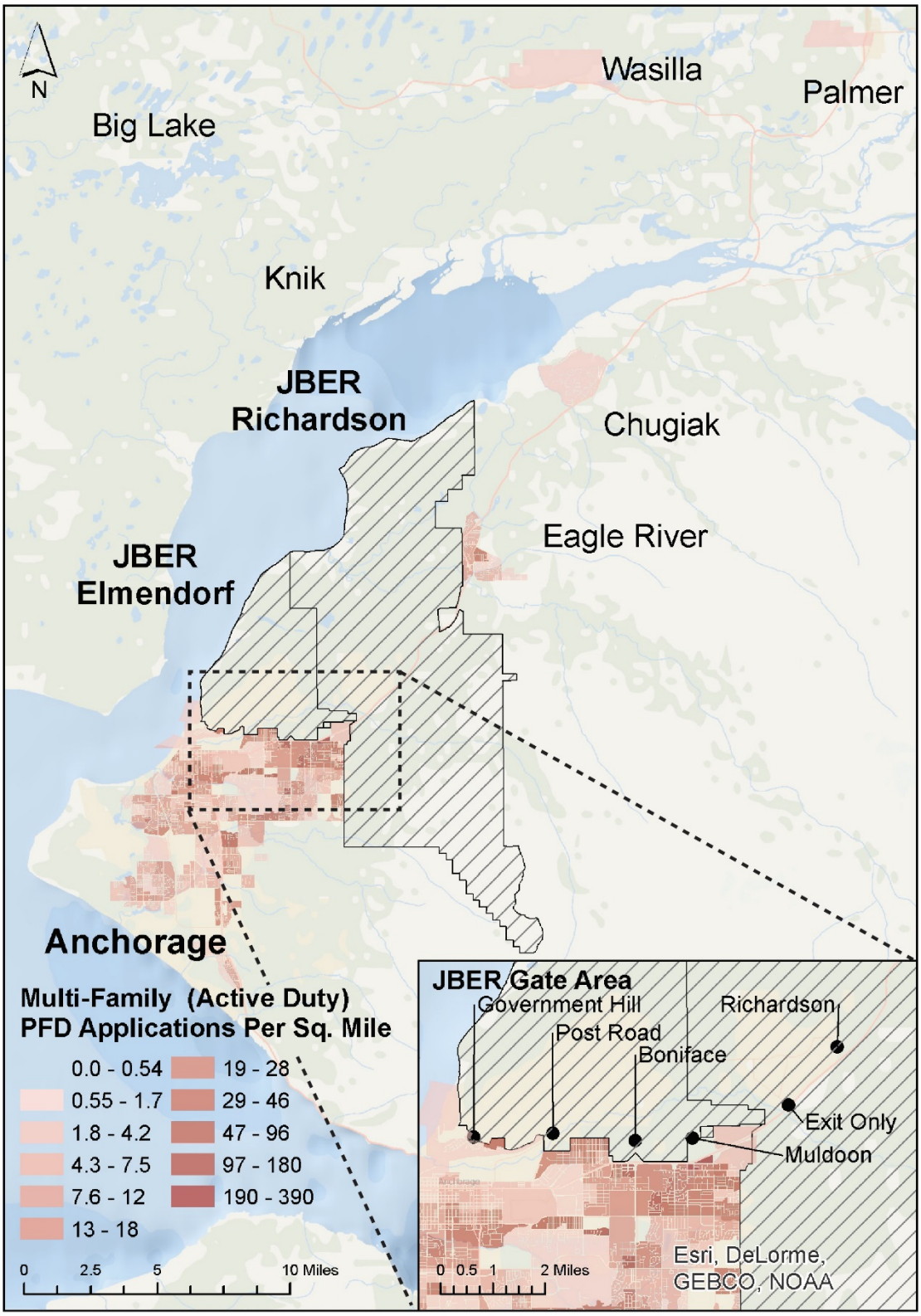
[26] Census blocks were further refined, or "clipped", by coastlines and MOA and MSB city parcels to reflect possible residential space.

Figure 78. Active Duty PFD Applicants Linked to Single Family Residence



Source: Northern Economics using data from the MOA (Schlosstein, 2016) the Permanent Fund Dividend (MOA, 2016b).

Figure 79. Active Duty PFD Applicants Linked to Multi-Family Residences



Source: Northern Economics using data from the MOA (Schlosstein, 2016) the Permanent Fund Dividend (MOA, 2016b) and the DOD (USARAK, 2016).

As mentioned above, direct impacts to capital stock may follow current active duty housing preferences. In terms of locational preferences, Table 15 shows estimated off base military housing by community council and type in the MOA. As shown in the table, active duty military personnel living in single family homes are disproportionately represented in the Eagle River Chugiak area (1,093) compared to the rest of the MOA, while the Northeast area contains the highest number of military households overall, and the highest number of active duty military choosing of "other housing"[27] types. In the Southeast area, namely Hillside East and Abbot Loop, we estimate that active duty military occupy some 373 single family homes, while in the Northwest areas we estimate 245 military households in other housing types. The Southwest area is estimated to contain a fair amount of active duty military in both single family and other housing types with 281 and 113 respectively.[28]

Table 15. Anchorage Community Level Active Duty Housing Characteristics

	Community Total	Active Duty Estimates	
Community Council	**Occupied Housing Units**	**Single Family Homes**	**Other Housing Types**
Eagle River Chugiak	**11,852**	**1,093**	**87**
Birchwood	778	22	7
Chugiak	2,839	119	19
Eagle River	3,984	345	57
Eagle River Valley	3,782	562	5
Eklutna Valley	31	0	0
South Fork	438	45	0
Northeast	**32,975**	**545**	**679**
Airport Heights	2,275	22	32
Basher	154	2	0
Campbell Park	3,380	22	83
Mountain View	2,463	15	27
Northeast	11,074	220	324
Rogers Park	1,411	19	4
Russian Jack Park	4,322	50	105
Scenic Foothills	3,352	132	32
Tudor Area	740	5	4
University Area	3,804	58	68
Northwest	**21,126**	**86**	**245**
Downtown	718	0	18
Fairview	3,465	10	61
Government Hill	1,393	2	26
Midtown	1,865	2	27
North Star	1,614	1	21
South Addition	2,207	11	24
Spenard	5,365	15	48

[27] Here, other housing types refer to apartments, duplexes, triplexes or higher, condos along with mobile homes, unknown housing types.

[28] It is important to reiterate here that these tables are unable to distinguish between members of the 4-25th and other active duty military personnel based at JBER.

	Community Total	Active Duty Estimates	
Community Council	**Occupied Housing Units**	**Single Family Homes**	**Other Housing Types**
Turnagain	4,499	45	21
Southeast	**17,105**	**373**	**48**
Abbott Loop	8,622	154	45
Bear Valley	267	2	0
Glen Alps	111	0	0
Hillside East	830	109	1
Huffman/O'Malley	3,637	54	1
Mid-Hillside	1,503	26	1
Rabbit Creek	2,135	29	0
Southwest	**20,969**	**281**	**113**
Bayshore/Klatt	4,416	76	16
Old Seward/Oceanview	2,733	33	12
Sand Lake	8,773	123	43
Taku/Campbell	5,047	48	42
Turnagain Arm	**1,207**	**6**	**0**
Girdwood	848	6	0
Portage Valley	14	0	0
Turnagain Arm	345	0	0

Source: Northern Economics using Data from the U.S. Census Bureau (2016a), MOA Assesor (Schlosstein, 2016) the PFD (MOA, 2016b) and the DOD (USARAK, 2016).

In the MSB, largely dominated by single family housing units, active duty military personnel reveal a preference toward the Knik-Fairview area (233 single family and 20 other housing types) followed by Lakes, Gateway, Wasilla city and Palmer City. A small number of active duty are also estimated to reside in Butte, Lazy Mountain and Farm Loop.

Table 16. MSB Community Level Active Duty Housing Characteristics

	Community Total	Active Duty Estimates	
Community	Occupied Housing Units	Estimate Single Family Homes	Estimate Other Housing
MatSu (Select)	16,927	711	89
Butte CDP	1,205	38	8
Farm Loop CDP	361	10	0
Gateway CDP	1,851	116	10
Knik-Fairview CDP	5,040	233	26
Lakes CDP	2,883	132	15
Lazy Mountain CDP	512	13	2
Palmer city	2,113	76	7
Wasilla city	2,962	92	21

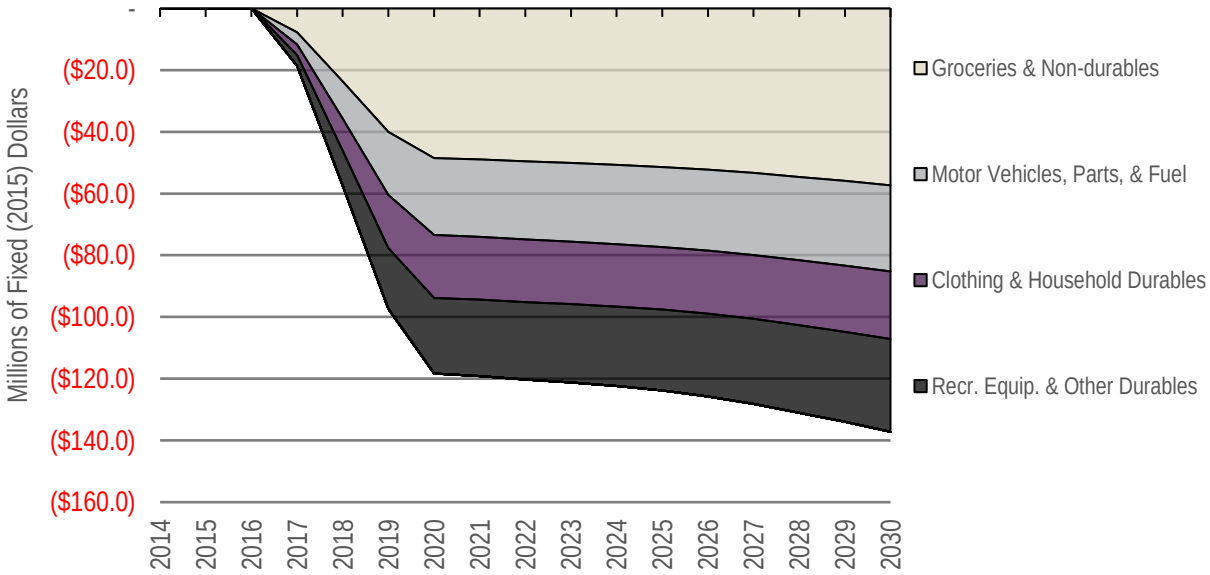
Source: Northern Economics using Data from the U.S. Census Bureau (2016a), MOA Assesor (Schlosstein, 2016) the PFD (MOA, 2016b) and the DOD (USARAK, 2016

5.3 Personal Consumption and Retail Sales Impacts

The military has long been a major component of the retail sector, with a disproportionately large role in retail sales due to service members' age and short terms of residence in Anchorage. Whether buying new vehicles for Alaska conditions, or furnishing houses and purchasing supplies for babies and young children, service members and dependents were recognized in focus groups as composing up to 30 percent of the clientele for many of these businesses. Military service members and their families are also very active in recreational activities, whether fitness, recreation, or hunting and fishing. They tend to buy sporting goods and use recreation/tourism services.

As result of the proposed 4-25th reduction, the REMI model estimates that all direct, indirect and induced personal consumption associated with retail trade in Anchorage, will decline roughly $120 million by 2020 (see Figure 80). Following the initial shock in retail spending, impacts are forecasted to continue to decline into 2030. Groceries and non-durables consumption (in tan) is estimated to see the largest impacts among retail, with a loss of roughly $50 million in 2020 compared to baseline conditions. Motor vehicle consumption is estimated to drop by some $24 million by 2020, along with impacts totaling $54 million between clothing, household durables, and recreational equipment.

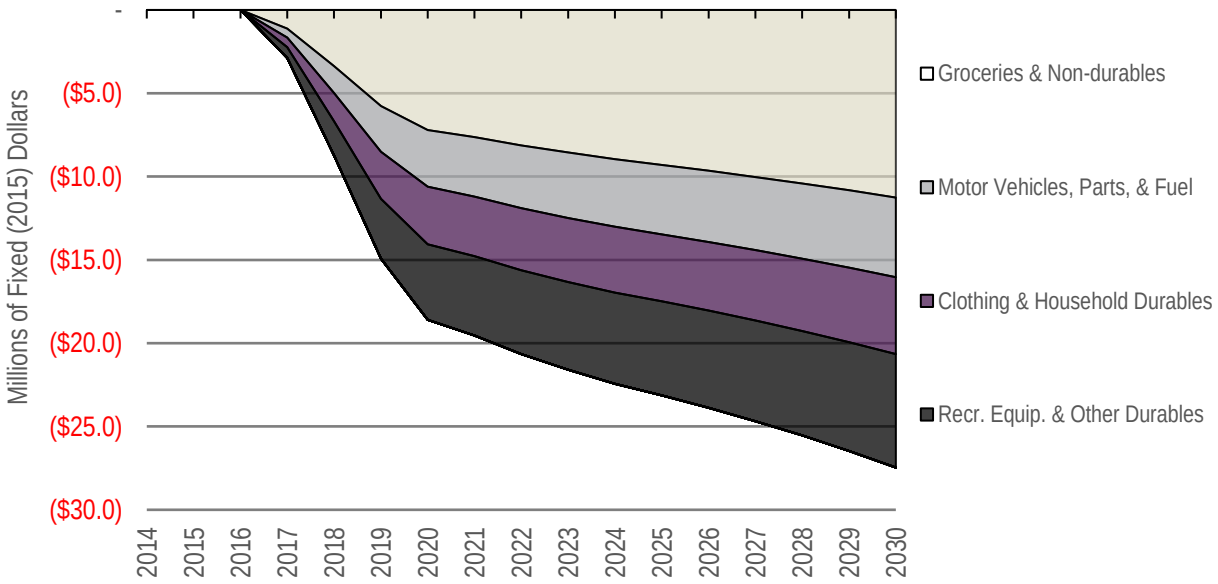
Figure 80. Anchorage Personal Retail Consumption



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

In the MSB, as seen in Figure 81, the groceries and non-durables category is also the largest affected category in retail consumer spending at an estimated $7 million loss in 2020. Motor vehicles, clothing and household, and recreational equipment and other durable goods all see a consumption reduction of $3-$4 million each in 2020.

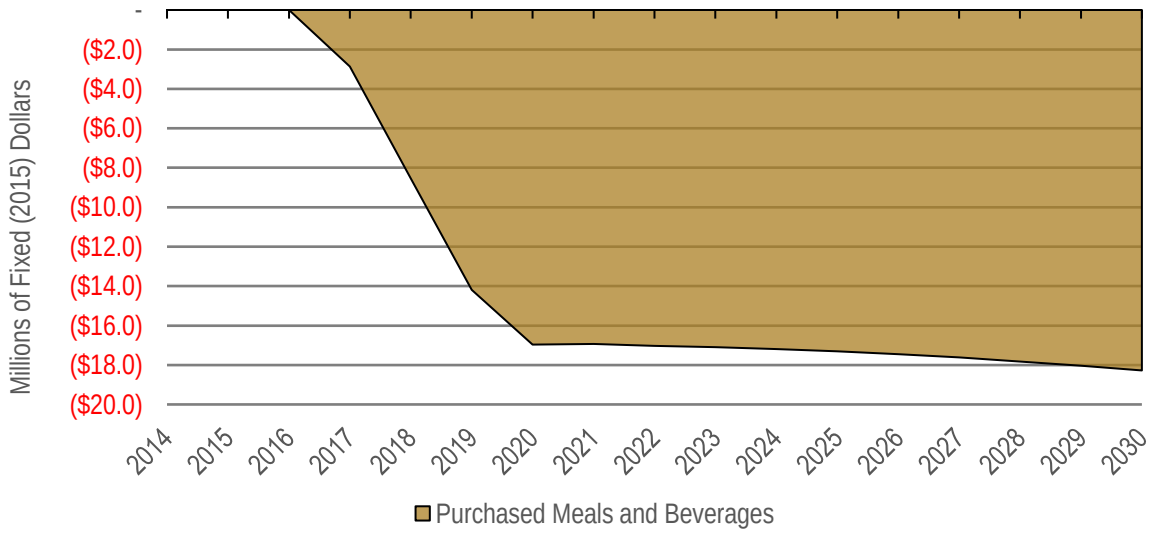
Figure 81. MSB Personal Retail Consumption



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Consumption spending related to the food and beverage industry in Anchorage shows estimated negative direct, indirect and induced impacts of over $16 Million in 2020 (See Figure 82). Additionally, negative impacts to the restaurant sector are expected to increase into the future only slightly. In 2030, food and beverage consumption, as a result of the troop reduction, is estimated be $18 million below current baseline levels.

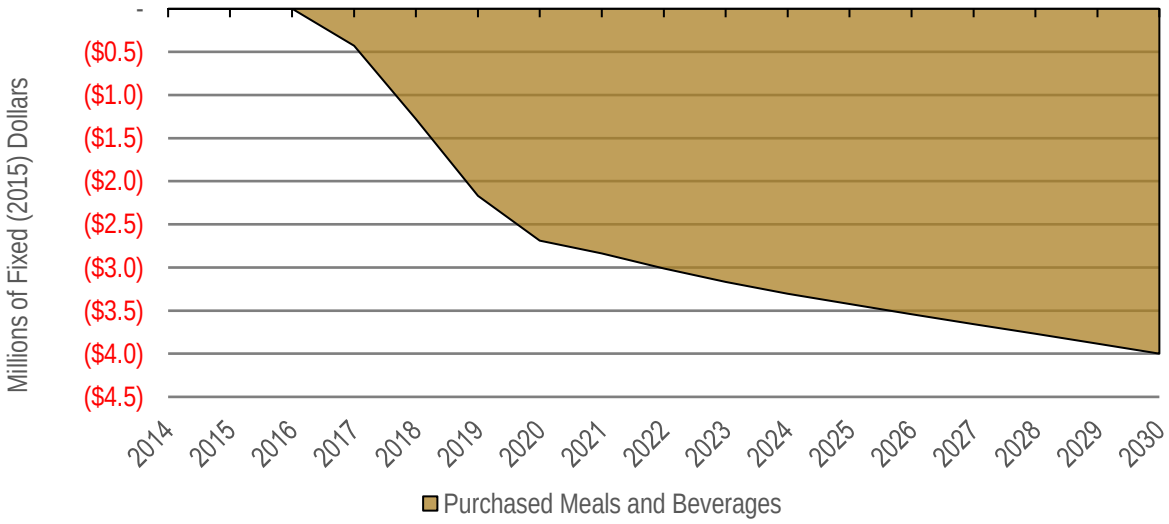
Figure 82. Anchorage Personal Food and Beverage Consumption



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Estimates show that personal consumption related the food and beverage industry in the MSB is likely to decline just over $2.5 million by 2020 then continue to decline to $4.0 million by 2030 (Figure 83).

Figure 83. MSB Personal Food and Beverage Consumption



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

5.3.1 Retail Sensitivity to JBER Populations

REMI estimated impacts to the retail and restaurant industries are not suggestive of location beyond Anchorage or the MSB as a whole. However, it is very likely that some retail and restaurant districts will be more heavily affected than others, based on their relative proximity to JBER gates and off-base military housing. In order to identify areas particularly sensitive to military patronage, the study team developed a suitability analysis using GIS.

Suitability analysis or "weighted site selection" is a mechanism commonly used to find the best and/or worst locations for something based on a set of pre-defined geographic criteria. The suitability analysis here seeks to systematically highlight retail and restaurant locations most likely impacted by active duty military using 3 factors:[29]

- Retail and food and beverage business density
- Active duty PFD application density
- Drive time from JBER

[29] Business location data for the suitability analysis were derived from InfoUSA's (2016) verified business records sorted for retail and food service types by North American Industry Classification System (NAICS) codes 44-45 and 722. The dataset was further divided into small retail (<$5Million/year) and large retail (>$5million/year) then geocoded and calculated as businesses per square mile.

Active duty PFD application density was created from geocoded 2015 PFD data (MOA, 2016b), sorted by active duty military, and calculated as applications per square mile. Drive times are calculated in 5 minute increments from the JBER post office located on Quartermaster Road.

The following is a series of sensitivity analysis steps illustrated by a corresponding series of maps that follow.

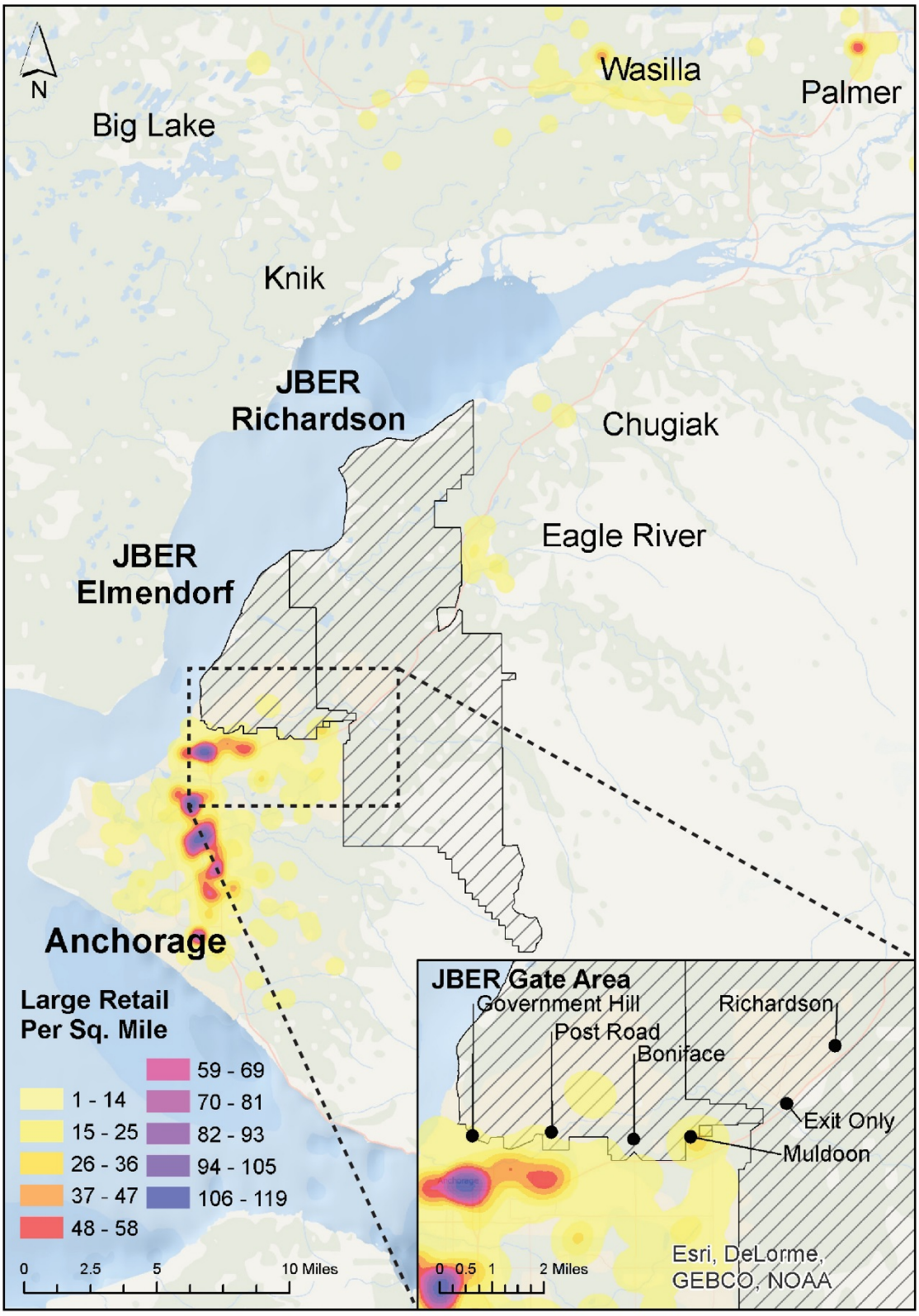
1. First, areas representing fewer than five large or small retail and restaurant locations per square mile are removed from the analysis. In this way, we only analyze areas with significant retail activity (See Figure 84 and Figure 85).
2. Second, PFD density (See Figure 86) and drive times from JBER were reclassified to fall within a relative 0-10 scale, where a score of 0 is the least impactful and a 10 is highly impactful. Table 17 describes the specific ranges chosen by the study team.
3. Third, drive times required to reach JBER in minutes was calculated in 5 minute increments and also assigned a relative 0-10 scale (See Table 17 and Figure 87)
4. Finally, scores were added together to create a composite layer highlighting applicable retail sectors by drive time from JBER and active duty military density. The resulting "sensitivity index" takes on a range from 0-20, where 0 represents a low reliance on military business and 20 represents the highest likelihood of military influence. Figure 88 illustrates the process using the Anchorage area as an example, and Figure 89 displays the full result.

Table 17. Retail Sensitivity Weights

Score	Active Duty PFD Applications Per Sq. Mile	Minutes from JBER
10	>316	0-5
9	281-315	6-10
8	246-280	10-15
7	211-245	16-20
6	176-210	21-25
5	140-175	26-30
4	105-139	31-35
3	70-104	36-40
2	35-69	41-45
1	1-34	46-50
0	0	>50

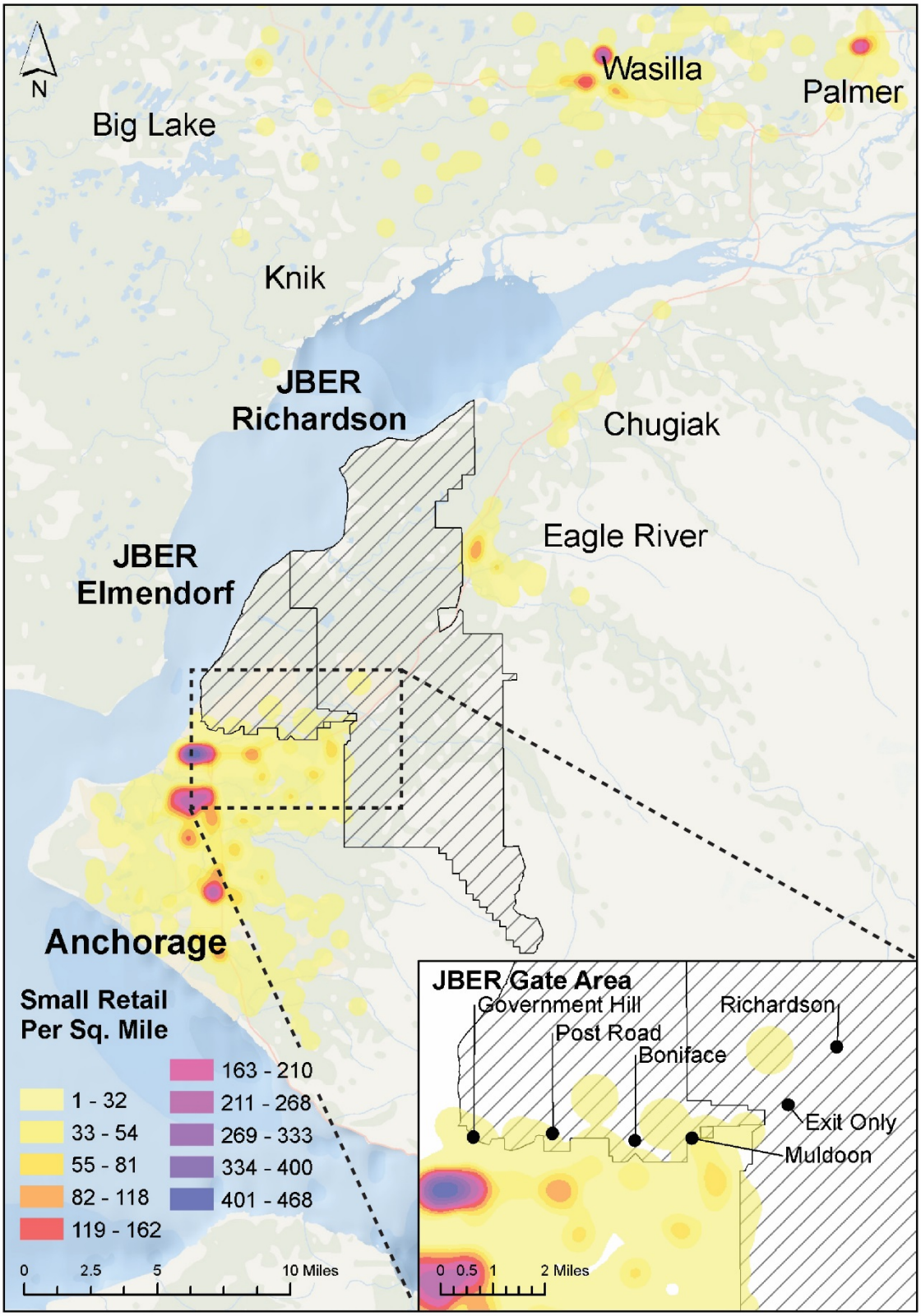
Source: Northern Economics using data from the MOA (2016b)

Figure 84. Large Retail Density



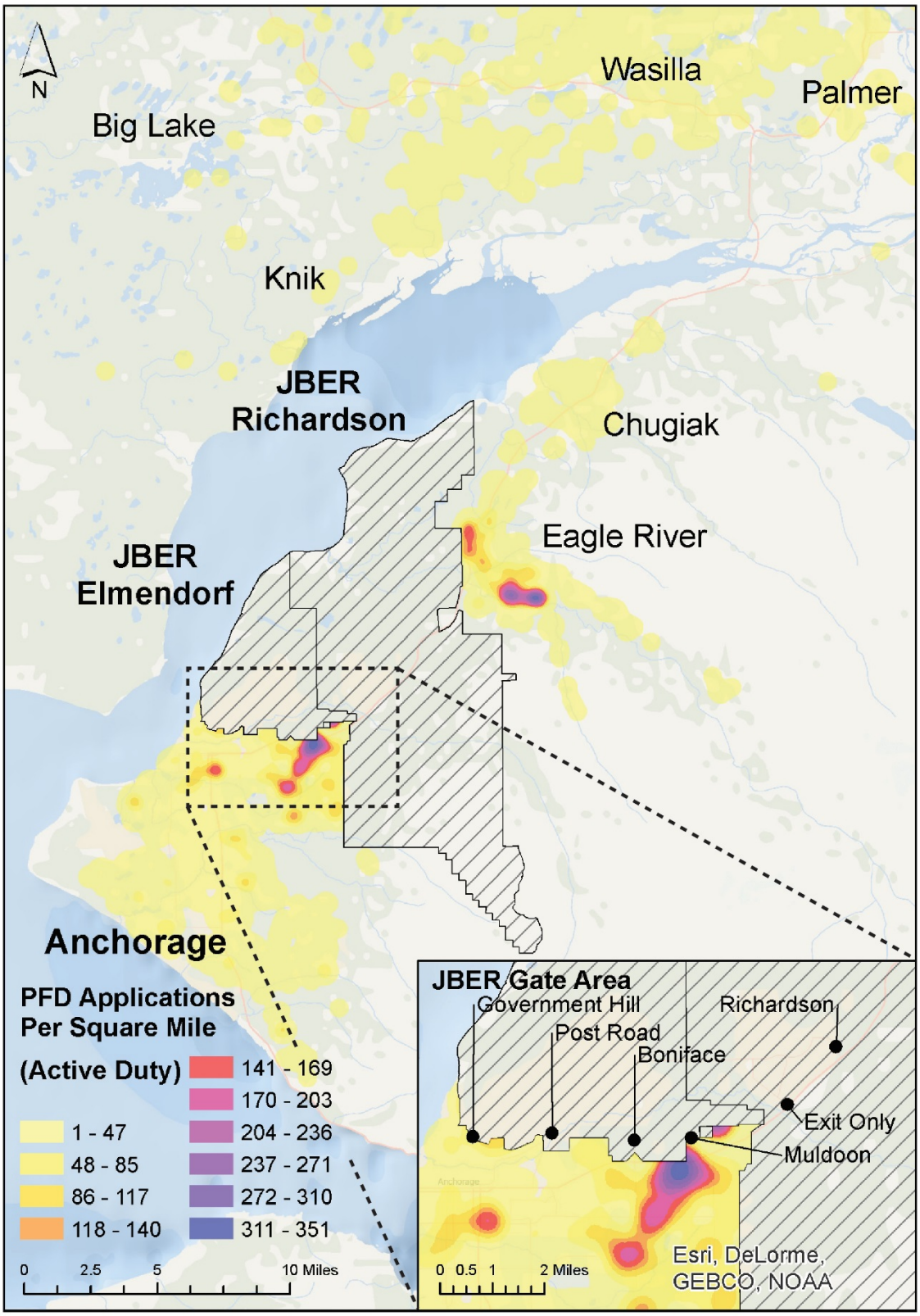
Source: Northern Economics using data from InfoGroup USA (2016)

Figure 85. Small Retail Density



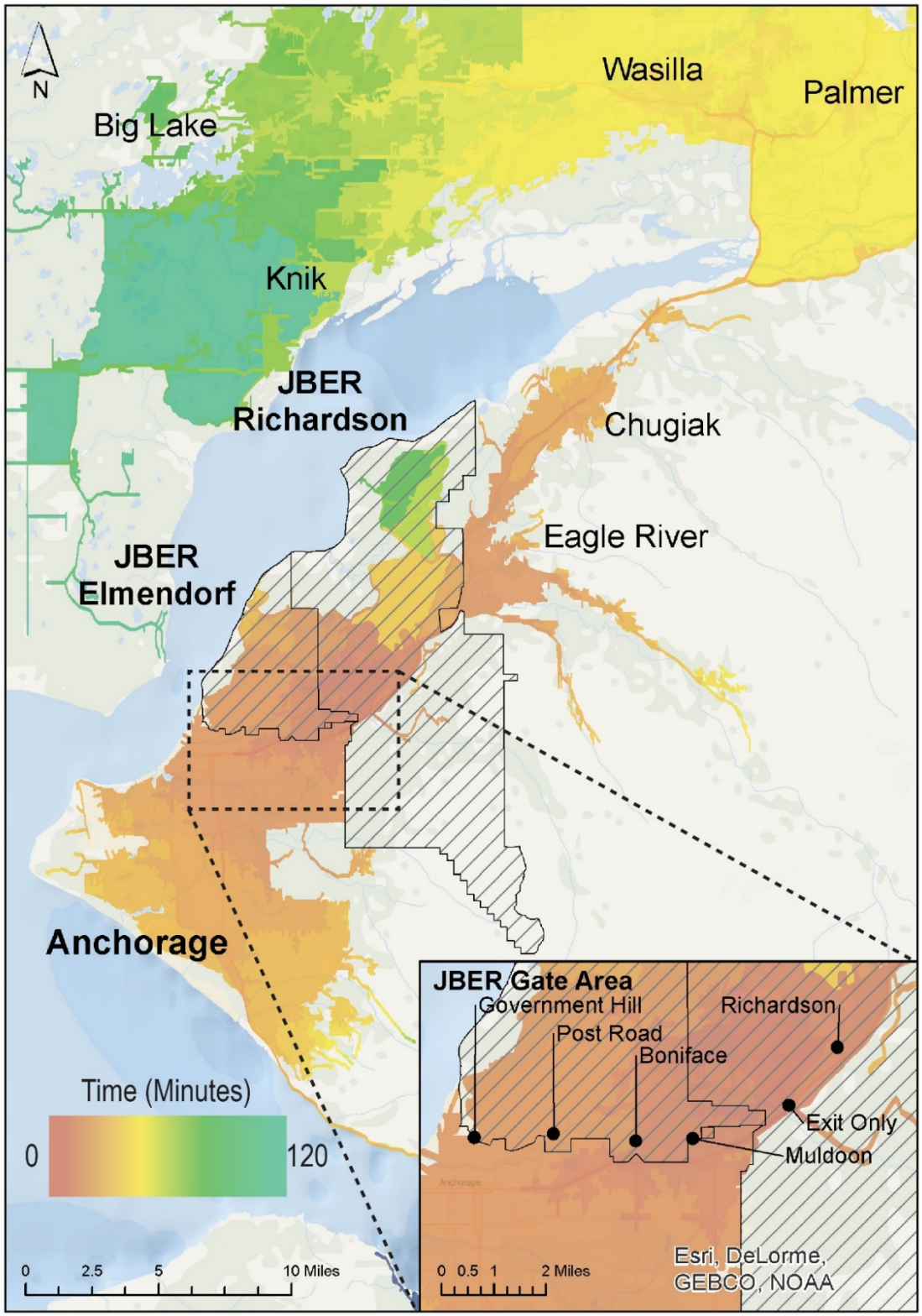
Source: Northern Economics using data from InfoGroup USA (2016)

Figure 86. 2015 Permanent Fund Dividend Application Density



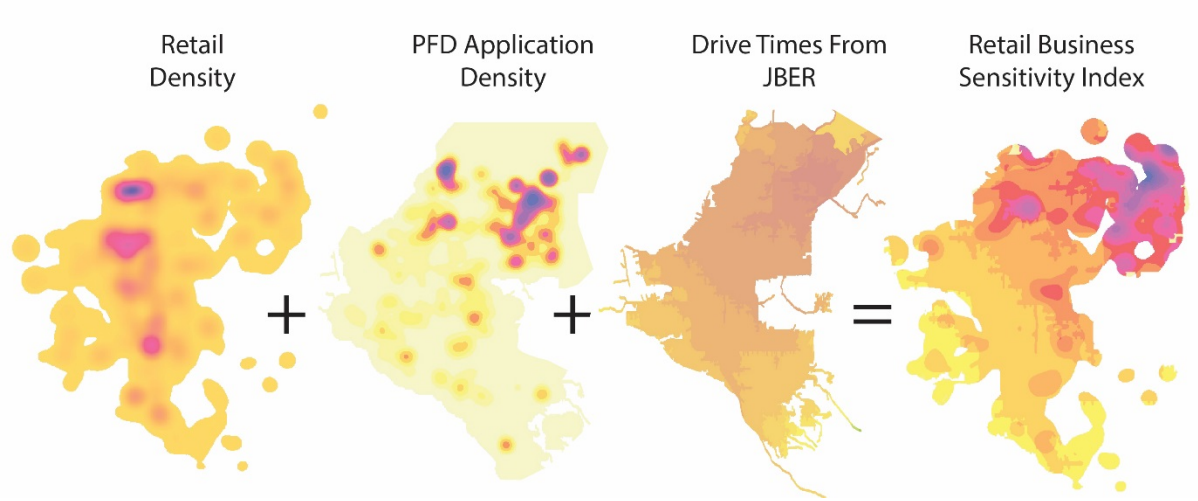
Source: Northern Economics using data from the MOA (2016b)

Figure 87. Drive Time Needed to Reach JBER Gates



Source: Northern Economics

Figure 88. Retail Sensitivity Calculation



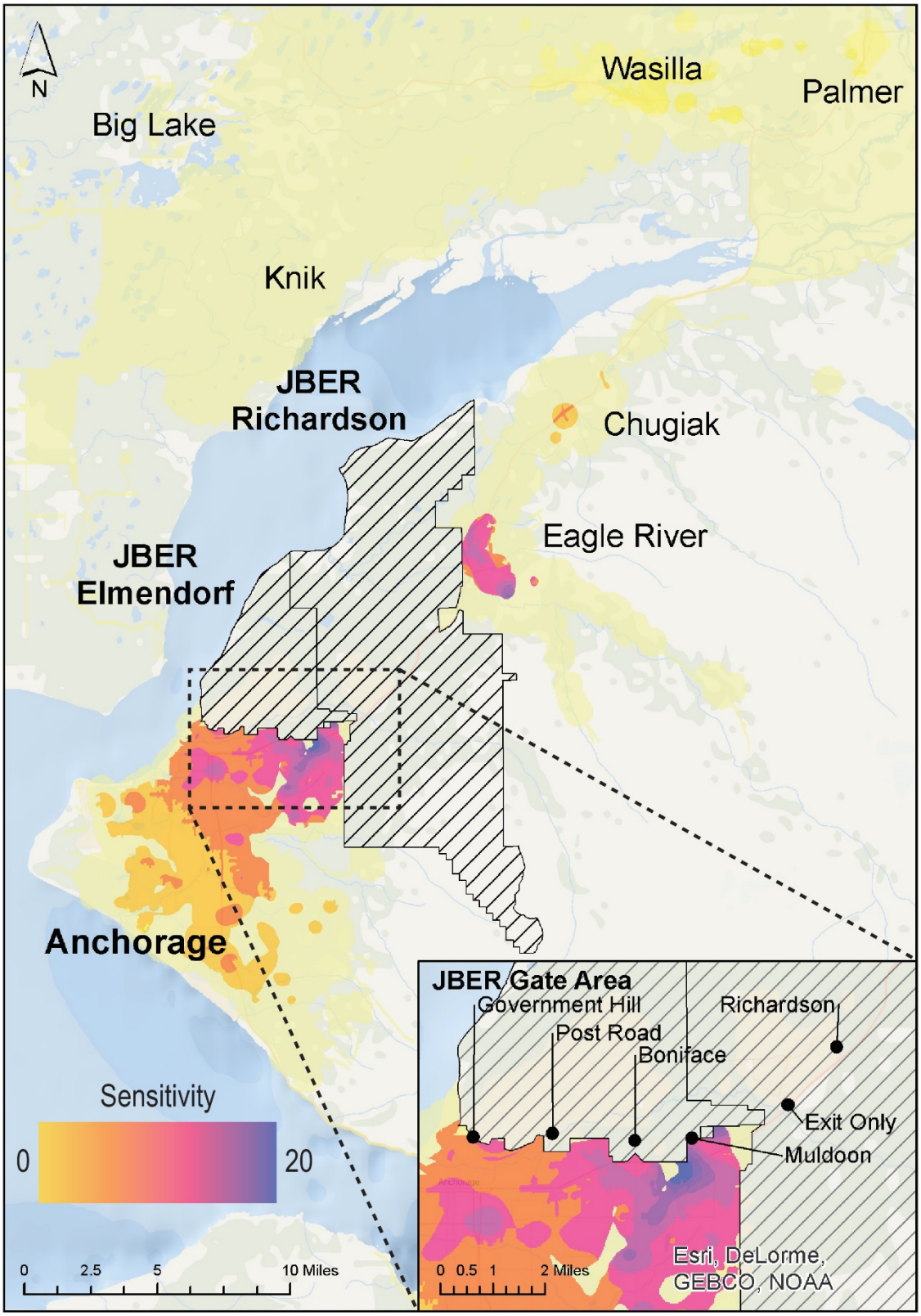
Source: Northern Economics using data from InfoGroup USA (2016) and the MOA (2016b)

As discussed in public outreach and confirmed by our business sensitivity analysis Figure 89, military personnel are likely economic drivers in northeast Anchorage and Eagle River (Figure 90). The Tikahtnu Center in northeast Anchorage was developed in large part to serve a military market, and it is now a major commercial center for the city. On top of the Tikahtnu Center's retail density and close proximity to multiple base gates, our analysis shows a high density of military residences close to the center (just over 300 active duty PFD applications per square mile shown in Figure 86). For these reasons, the Tikahnu Center, along with other retail and restaurants in the Muldoon area, is positioned to be disproportionally affected should the drawdown at JBER occur.

People generally prefer to shop and dine near their place of residence. Eagle River shares the same distance from JBER as much of the rest of anchorage in terms of road minutes (Figure 87); however, our analysis suggests that it is also highly dense in terms of active duty residence (Figure 86). As a residential hotspot, it is likely that Eagle River retail attracts a large amount of non-durable goods spending (groceries etc.), as well as restaurant patronage from its military. Other areas highlighted by the analysis as vulnerable in terms of distance from the base, and residential hotspots, include the Mountain View area, Government Hill, and parts of midtown.

Retail and restaurant sensitivity in the MSB are found to be fairly uniform when it comes to military business due to having little or no variation among determining factors. Distances in terms of road minutes are similar from JBER to many populated areas in Wasilla and Palmer (Figure 87). Further, living preferences, in terms of active duty PFD density across the borough, are spread fairly evenly (Figure 86), or are too subtle to pick up based on our analysis.

Figure 89. Retail Sensitivity to Active Duty Military Populations: Final Map



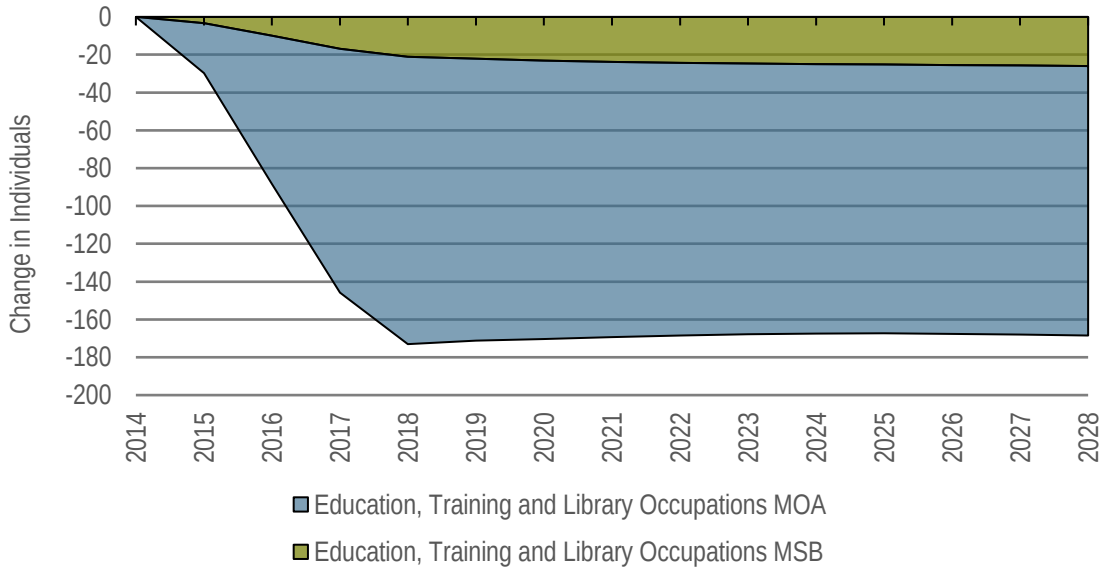
Source: Northern Economics using data from InfoUSA (2016)

5.4 School Impacts

Results from the Alaska REMI Model report direct and induced negative impacts in the education training and library occupations sector (hereafter referred to as education) resulting from a reduction in the 4-25th. This sector includes public schools, along with private schools, public and private universities, and all related services.

Figure 90 and Figure 91 illustrate the negative impacts to education employment in the MOA and the MSB in terms of total jobs lost and percentage change.[30] In 2020, the MOA is estimated to lose a total of 152 jobs, or 1.5 percent of its total labor force associated with education as result of the reduction. Education impacts to the MSB result in a loss of just over 20 jobs, or a 0.8 percent change from its forecasted baseline in the same year.

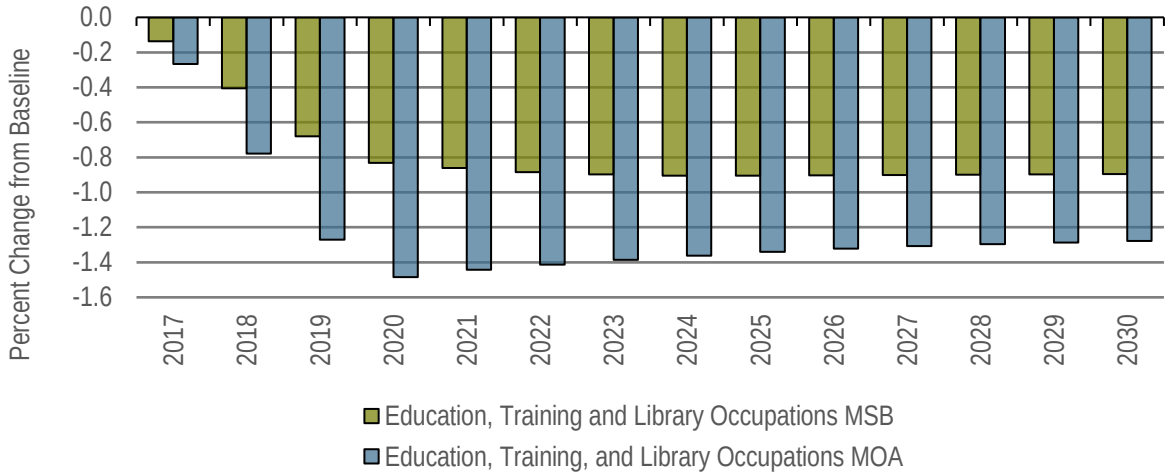
Figure 90. Education Related Employment Change from Baseline



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

[30]These data are based on "occupation" data rather than on "employment" data as reported to the BLS. Most education jobs in the U.S. are reported as Local Government Employment, and as such are lumped in with other city, county, and borough employees. Employment in Private Education industry sector is reported to the BLS, but using estimates from the Private Education as a proxy for public education will lead to significant under reporting. The BLS gathers data on occupations, but these data are generally seen as less robust than actual employment data.

Figure 91. Education Related Employment Percentage Change from Baseline



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Estimated by Northern Economics using the Alaska REMI Model.

5.4.1 Anchorage and Matanuska-Susitna Borough Public Schools

Student Count by School

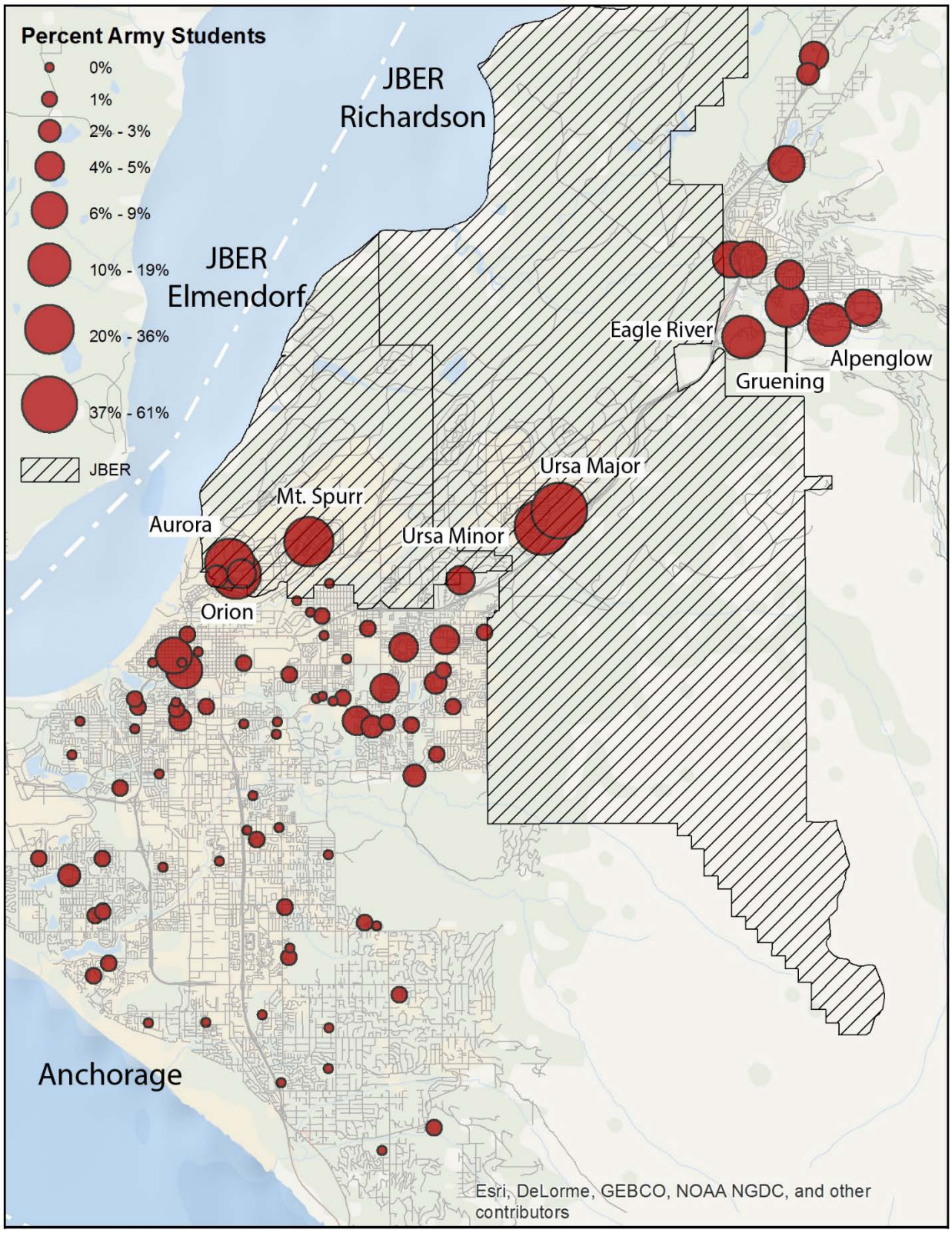
In the Anchorage School District an estimated 3,787 students are associated with active duty military (ASD, 2016a). Among these, some 1,259 students attend one of the five on-base elementary schools and 1,627 belong to Army affiliated parents specifically. Additionally, ASD schools near JBER enroll a disproportionally high number of Army-affiliated students relative to others. Figure 92 provides a graphical indication of schools that host USARAK children. The top 5 off-base schools in the ASD, determined by Army affiliated enrollment as a percent of total, are shown in Table 18.

Table 18. Percentage of USARK and Total Military Enrollment in ASD Schools

School	USARK Students (%)	All Military Students (%)
Gruening Middle School	19	40
Eagle River High School	17	35
Alpenglow Elementary	12	37
Central Middle School of Science	9	21
Turning Point Heights	7	7

Source: Northern Economics Using ASD (2016a) data.

Figure 92. ASD Army Affiliated Student Enrollment as a Percentage of Total



Source: Northern Economics Using ASD (2016a) data.

2,197 military connected children are estimated to attend school in the MSB according to the MSBSD (MSBSD, 2016). However, due to the fact that the MSBSD uses a different data system than used in the ASD, this figure includes children connected with all active duty military at JBER, but is also likely to contain those connected with DOD contractors, retired military, and reservists. The MSBSD was also not able to break out student counts by military branch. The top five schools[31] in the MSB determined by military affiliated enrollment as a percent of total are as follows:

- Swanson Elementary School: 19%
- Machetanz Elementary School: 19%
- Sherrod Elementary School: 19%
- Colony High School: 16%
- Finger Lake Elementary School: 16%

Direct Student and Teacher Impacts[32]

Discussed in section 2.1.2.3, a force reduction in the 4-25th will likely cause a decrease in military-connected children receiving public education in both the ASD and MSBSD. Assuming a full reduction of 2631 from the current TOE, the ASD stands to lose 905 students (1,235 – 330) while the MSB will lose an estimated 319 students (435-116).

REMI results, shown above in Figure 90 and Figure 91, are inclusive of all education related jobs, however some majority of the impacts will be felt across the ASD and MSBSD directly in the form of teaching staff. With a student teacher ratio of 17:1 in FY2016 (ASD, 2016c), the ASD can expect a reduction of some 54 positions in response to student losses. Similarly, with a student teacher ratio of 18:1 in FY2016 (ADEED, 2016c), the MSBSD can expect a reduction of 25 teaching positions.[33]

State and Local Aid[32]

Regardless of military connection, each student in the ASD and MSBSD influences the level of yearly revenue their districts receive through state entitlements and local contributions. The loss of these revenues, associated with the proposed 4-25th force reduction is estimated to be $16.6 million annually between the ASD and MSBSD.

Table 19 shows local city and borough appropriations as well as the state operating fund revenue spending per student in FY 2014.[34] The ASD receives more revenue than the MSBSD per student at the local level; however, due to higher state revenues for the MSBSD, both districts roughly receive equal revenue per student. Also shown in Table 19, are the revenue impacts to the ASD and MSBSD, should the reduction occur. A loss of 905 ASD students would result in a total annual loss of $12,217,480 for

[31] Talkeetna Elementary School reported 17 percent military affiliation, or 18 students, but was removed. Talkeetna's military enrollment was likely due to retired or reserve military reported in the dataset or by error.

[32] Please note that this section was prepared prior to receiving more accurate USARAK data (USARAK, 2016) specifying school age children associated with the 4-25th. The most recent estimates show a reduction of 905 ASD students (a 1 percent change from the estimates below) and a reduction of 319 students in the MSB (a 30 percent change from the estimates below) as a result of force reduction of 2,631. We will update this section in the final draft to reflect these changes.

[33] This is basically equal to the Alaska REMI forecast, and suggests that most of the education impacts in the MSB will be at the public school district level.

[34] 2014 was the most current audited revenues available at the time of this report.

the district, assuming 2014 funding levels, equal school size adjustments and other student-specific factors.[35] Similarly, a loss of 319 MSBSD students would result in a loss of $4,421,021 per year.

Table 19. Impacts to State and Local Aid

Annual Revenue Per Student	Local	State	Total
ASD	$4,029	$9,354	$13,383
MSB	$2,940	$10,919	$13,859
Annual Budget Impact			
ASD	-$3,646,245	-$8,465,370	-$12,217,480
MSB	-$937,860	-$3,483,161	-$4,421,021

Source: Northern Economics, using data from Alaska Department of Education and Early Development audited FY2014 revenues.

Allocating state funds to a given school district above is based heavily on average daily membership (ADM). Each ADM is adjusted for respective school size, cost factors, and special needs considerations, among others, to arrive to a district wide adjusted ADM (ADEED, 2015b). To arrive at total state entitlement for the district, the ADM is multiplied by a state base allocation and local and federal contributions, and adjusted for grants. Local contributions are equal to a 2.65 mil tax on real and personal property within the district (ADEED, 2015b).

Federal Impact Aid[36]

Federal Impact Aid (Public Law 874), assists school districts, on a district by district basis, that have either lost revenue from federally tax exempt properties in their attendance areas, and/or incur higher expenses due to students location, military, Indian, or federal civilian status. A given school district is eligible for Federal Impact Aid if at least three percent of its average daily attendance is federally connected, or, if average daily federally connected attendance in the district is at least 400. Currently, the ASD is eligible for and receives Federal Impact Aid, but the MSBSD, while potentially eligible, has not been able to document that it meets the eligibility criteria.

Table 20 shows total impact aid available to the ASD in 2014, aid considered eligible for state consideration. For every dollar of impact aid received by the district, the state reduces its education formula by roughly 50 percent in response. Therefore, to show the net effect of impact aid to the ASD, Table 20 also gives impact aid after state formula reductions. For example, the Anchorage school district received $20.8 million in federal impact aid in 2014 and netted just over $12 million after accounting for state funding reductions[37].

[35] Other factors could include special needs, technical education, correspondence and intensive service.

[36] This section was prepared prior to receiving more accurate USARAK data (USARAK, 2016) specifying school age children associated with the 4-25th. The most recent estimates show a reduction of 905 ASD students (a 1 percent change from the estimates below) as a result of force reduction of 2,631. We will update this section in the final draft to reflect these changes.

Table 20. Federal Impact Aid and State Withholdings, 2014

Federal Aid (Rounded $1000s)	FY2014
Total Impact Aid	$20,887
Eligible Impact Aid	$20,220
Impact Aid Percentage	49%
State Education Funding Reduction	$8,868
Net After State Funds Reduction	**$12,019**

Source: Alaska Department of Education and Early Development
Note: Education Funding Reduction is 90% of Eligible Aid × Impact Aid Percentage.
Note: Does not include non-eligible impact aid.

A reduction in the 4-25th would likely affect Federal Impact Aid to the ASD. However, the effects can be difficult to interpret for two reasons. The aid calculation from district to district contains many complex moving parts such as student weights, local contributions and the percentage of federally connected students in a district, among others (see Appendix C: Calculation of School Attendance and Impact Aid Calculations for a more detailed discussion). Second, many characteristics of how the reduction will unfold in terms of on and off-base student demographics are generally unknown.

In order to communicate the effects of a drawdown on Federal Impact Aid to the ASD on a relatively simple scale, three possible scenarios were developed, run through an impact aid model developed by Northern Economics Inc., and compared to a 2014 baseline.[38] The scenarios are as follows:

1. Military connected students, reduced as a result of the drawdown, reside in on-base and off-base housing in equal proportions. Vacancies in on-base housing, as a result of the drawdown, remain vacant.
2. Due to a robust waiting list for on-base housing (Aurora Military Housing, 2016), vacancies attributed to the reduction are quickly filled by military families, and cause only off-base military student counts to drop.
3. Military connected students, reduced as a result of the drawdown, reside in on-base and off-base housing in equal proportions. However, to fill on-base vacancies, civilians are allowed to live in privatized housing, half of which work on base, half work off.

Table 21 shows the estimated change to Impact Aid should any of the respective scenarios occur. Scenario 1 results in the largest annual effects with a loss of just over $2 million a year in Federal Impact Aid to the ASD; scenario 2 shows very little change compared to the current status quo; and scenario 3 gives a moderate loss of $549,000 a year.

[38] 2014 data were chosen for comparison because of availability of reference data used in modeling assumptions.

Table 21. Impacts to Federal Aid

	Scenario			
Federal Aid (Rounded $1000s)	**2015 Baseline**	**Scenario 1**	**Scenario 2**	**Scenario 3**
Total Impact Aid	$20,887	$17,200	$20,777	$19,910
Eligible Impact Aid	$20,220	$16,532	$20,110	$19,243
Impact Aid Percentage	49%	49%	49%	49%
State Education Funding Reduction	$8,868	$7,251	$8,819	$8,439
Net After State Funds Reduction	**$12,019**	**$9,949**	**$11,957**	**$11,471**
Change From Baseline		**-$2,070**	**-$62**	**-$549**

Source: Northern Economics based on Alaska Department of Education and Early Development data.

Impacts from scenario 1 are orders of magnitude larger than others due to the fact that on-base, federally connected students are heavily weighted. For example, an active duty military student living on base would receive a weighting of 1.0, while an active duty military student living on private land would receive a weight of 0.2. Another compounding factor in Scenario 1, is that the Impact Aid program views JBER, Coast Guard Base Kodiak along with Eielson AFB and Ft. Wainwright as one district (ADEED, 2016d). This means that the four bases are calculated together, separate of the districts around them, and leverage a much higher percentage of federally connected students. Higher federal membership equals a larger allocation of possible funding per student.

The trivial effects of Scenario 2 are expected as federally connected students living on JBER remain constant. The loss in military connected students living off base carries low weights and is subject to the ASD's percentage of federally connected students, which is low in comparison to the base "district"

We attribute the moderate effects found in scenario 3 to student families—some of whom are military and some of whom are not—filling in on-base vacancies. The transition from all military to partial military living on-base provides less impact aid over the status quo, but still generates aid from non-military weighting categories such as civilians living on base but not working on federal land (0.05), and civilians living on-base and working on federal land (1.0).

DODEA Partnership Grant

Started in 2007, the Department of Defense Education Activity Grant (DODEA) aims to ease the process of transitioning military students. The grant program focuses heavily on building up STEM (science, technology, engineering and math), language, wellness, emotional support as well as special education programs (Gaitens, 2014).

In FY2011 the ASD was awarded $2.5 million for Project Connect, a collection of clubs, curriculum research, training, and field trips centered on meeting the needs of military students. The program operates at the districts most impacted schools, Bartlett High School, Eagle River High School, Central Middle School and Gruening Middle School. During the first three years of the program, the number of military students on track to graduate increased 7 percent (ASD, 2016b). In FY2015, the ASD was selected again for its already strong focuses in STEM, foreign language programs, and family engagement (Thaniel, 2014) and awarded $1,747,157. 2015 funds will be used to continue Project Connect and identify gaps in reading and math between disabled and non-disabled students so that teachers may adapt their teaching techniques accordingly.

A reduction in military attendance could affect the school district's ability to secure grants like the DODEA partnership in the future. Eligibility for the DODEA grant is contingent on having a military-connected population of 15 percent or more at the school level (Thaniel, 2014). In October 2015, the

four schools nominated to receive the grant averaged 26 percent military-connected students per school. As the 4-25th draws down, military-connected student ratios are likely to drop, which may cause the district to be less competitive in the grant process, or be required to narrow the list of schools that can be used to secure the grant.

5.5 Utilities

Several utility companies provide JBER and the surrounding MOA with electricity, gas, water and waste removal services through the base's utility systems operator, Doyon Utilities. This section discusses in further detail the potential impacts to individual utilities in the face of a 4-25th reduction.

Electric

Electricity is provided to JBER through Doyon Utilities as well as Municipal Light and Power (ML&P). ML&P is a large natural gas-fired utility serving downtown and midtown Anchorage, Ship Creek and Port of Anchorage industrial sectors, while Doyon's sole electrical customer in the Anchorage area is JBER-Richardson. ML&P has a generation capacity of 379.2 MW with a peak demand of 171 MW. Doyon operates a 7 MW methane-to-power plant at the Anchorage Municipal Landfill (MOA, 2016a).[39]

Currently, JBER-Elmendorf is ML&P's largest customer, and until 2013, and JBER-Richardson is second. JBER as a whole provided 9.4 percent of ML&P's revenue in 2014, not including resale power to other utilities. When Doyon's methane-to-power plant came online in 2012 (Bedard, 2016), ML&P's power sales to JBER-Richardson fell nearly 75 percent, from over 70 million kWh to 19 million kWh within four years (2011–2014). Because JBER-Richardson and JBER-Elmendorf are not connected in terms of power usage, ML&P power sales to JBER- Elmendorf remained largely unaffected by the Doyon plant. According to interviewees, the Doyon plant is believed to be at full capacity and ML&P expects its overall JBER power sales to remain at 2014 levels for the foreseeable future.

Although the proposed 4-25th reduction would cut active duty Army personnel by roughly 50 percent, it is unlikely that electrical demand would decrease by the same magnitude for several reasons:

1. Base electrical loads would still be provided to most facilities regardless of occupancy;
2. Likelihood of on-base housing being filled via waiting list (Aurora Military Housing, 2016) or other tenants;
3. Likelihood of services remaining open for the remaining task force;
4. Likelihood of repurposed facilities for the remaining task force, Airforce, or the general public;
5. Infrastructure maintenance would still be required.

Given its lion's share of JBER-Richardson power supply, Doyon may still experience some reduction in demand. Interviewees indicate that, because of Doyon's methane-to-power plant, JBER-Richardson represents a much smaller piece of ML&P's business than it had in the past. ML&P could further mitigate impacts to its ratepayers through its part ownership of the Beluga River Gas Field. Because ML&P owns the majority of its fuel stock, a demand reduction at JBER-Richardson simply extends the amount of gas available for future years instead of straining more traditional gas supply agreements.

As it stands currently, if a force reduction claimed the remaining 19 million kWh provided by ML&P, the utility would lose roughly $2.4M in annual revenue. As a result, the average ML&P customer would see an estimated rate increase of $13/year for households and $275/year for commercial (ML&P, 2016b).

[39] The electricity grids for JBER-Elmendorf and JBER-Richardson are separate and not directly interconnected.

Natural Gas

Natural gas for heating at JBER is provided by ENSTAR Natural Gas, a division of SEMCO Energy, Inc. a wholly-owned subsidiary of AltaGas. ENSTAR services some 140,000 residential, commercial and industrial customers from Willow to Homer, Alaska. In total, the utility provides gas to 57 percent of the state's population and reported a gas operating revenue of $301 million in 2015 (Dieckgreff, 2016). According to sources within the company, ENSTAR operates the system at JBER-Elmendorf exclusively. However, at JBER-Richardson, ENSTAR has sales agreements with Doyon, which in turn distributes to its customers. Additionally, ENSTAR holds contracts with Doyon to maintain JBER-Richardson's natural gas infrastructure (ENSTAR, 2016).

Data received from ENSTAR indicate that the annual gas consumption at JBER-Richardson was roughly 6.7 million Ccf (hundred cubic feet) in 2015, at a total charge of nearly $5.8 million. JBER-Richardson also provides revenues to ENSTAR in the form of various maintenance contracts to maintain the current pipeline infrastructure.

Although the proposed 4-25th reduction would cut active duty Army personnel by roughly 50 percent, it is unlikely that electrical demand would decrease by the same magnitude for several reasons:

1. Base heating loads would still be provided to most facilities regardless of occupancy;
2. Likelihood of on-base housing being filled via waiting list (Aurora Military Housing, 2016) or other tenants;
3. Likelihood of services remaining open for remaining task force;
4. Likelihood of repurposed facilities for the remaining task force, Airforce, or the general public.
5. Infrastructure maintenance would still be required

A more realistic scenario is to assume that the proposed reduction will affect gas demand similar to that of a historical 4-25th deployment. During a deployment, facilities such as the commissary, exchange, recreational facilities etc. generally remain open. Some facilities, specific to 4-25th training and operation may also operate at minimal levels during a deployment, but still require base heating.

Northern Economics compiled interview feedback, military literature, news articles discussing when the 4-25th had deployed in the past, and historical JBER-Richardson gas usage data from 2009–2015 provided by ENSTAR. Using these data, a deployment schedule was developed and compared to corresponding monthly gas usage at JBER-Richardson. Using econometric techniques to control for the effects of temperature on gas usage[40] the study team estimates that a deployment of the 4-25th reduces gas demand by 8 to 17 percent. Depending on customer type, this amounts to a loss of around $464,000 to $926,000 annually, not including any revenue associated with lost maintenance contracts.

Solid Waste

Operators in the solid waste sector suggest that JBER and its surrounding areas represent a important amount of business. On-base construction boxes collected during project work, along with restaurant and bar dumpsters near the base, are especially noted as key pieces of revenue. Pickup service for on-base housing and military living off base also make up a non-negligible contribution to residential routes.

Waste companies largely track the economy. Interviewees note, however, that impacts associated with a force reduction may be disproportionate depending on the company's size, type, and service territory. For example, if less new construction occurred on account of the drawdown, current projects, connected with the base, may take several years to finish up. Given a lag, large companies providing "construction boxes" should have the time and resources necessary to adjust their long run plans. On

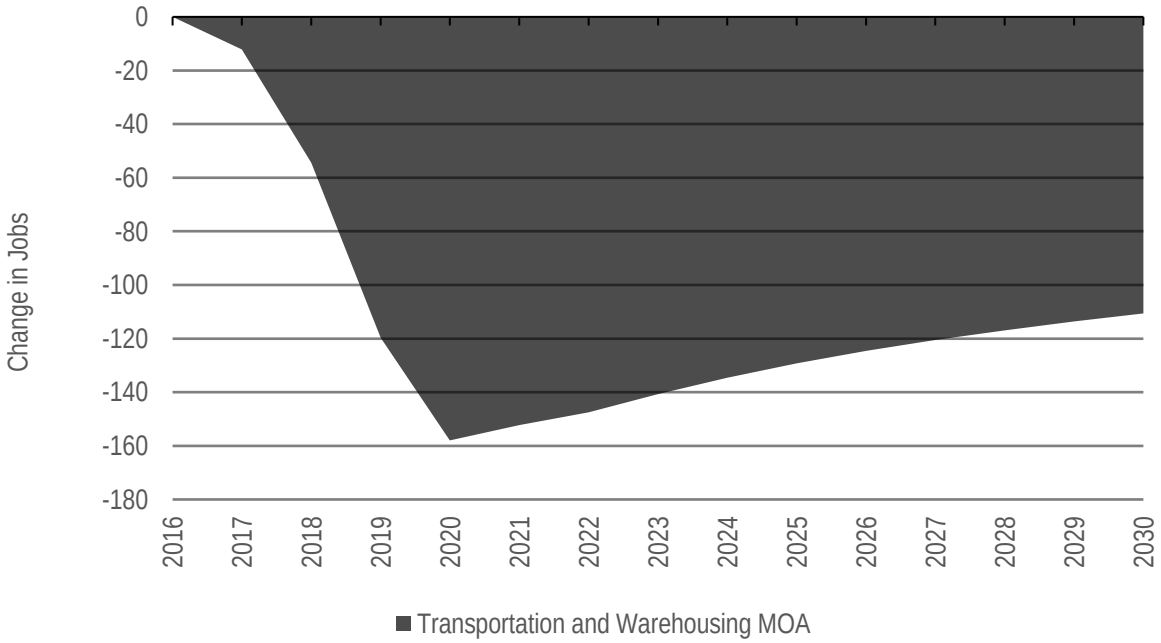
[40] See Appendix D: Utility Impact Calculations

the other hand, smaller companies relying on residential routes and local restaurant dumpsters may be more prone to impacts. While 2,631 residential pickups individually represent very little revenue, interviewees indicated that it does not take many single losses for a whole route to lose its overall efficiency. Effects from any restaurants or bar closures along the same route would further amplify the issue. Companies servicing Muldoon, Boniface, and Mountain View may be particularly vulnerable.

5.6 Transportation and Storage

Figure 93 and Figure 94 show results from the Alaska Model of estimated impacts to the transportation and warehousing industries in Anchorage.[41] As a result of the force reduction, employment to the transportation and warehousing industry as a whole will lose an estimated 158 jobs (Figure 93). Figure 94 describes a drop in wages and salaries in 2020 of around $9 million which continues fairly steadily into 2030.

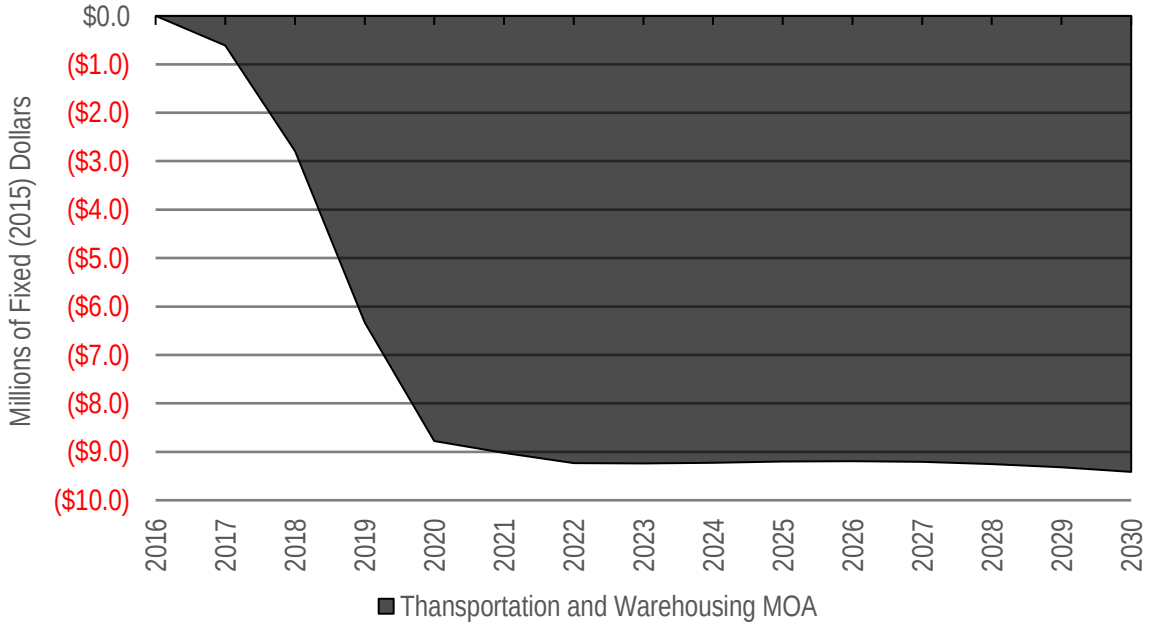
Figure 93. Anchorage Job Impacts to Transportation and Warehousing



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

[41] Transportation and warehousing impacts in the MSB are negligible and not presented here.

Figure 94. Anchorage Wages and Salaries Paid to Transportation and Warehousing



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Transportation and Logistics

The military relies heavily on local supply chains for deployment support, troop rotation, and procurement of equipment, supplies and fuel. Due to JBER's geographic location, the majority of all movements to and from the base are waterborne, moving through the Port of Anchorage or Alaska Marine Lines barge terminal.

When deployed, the Army transports all equipment, less troops, through the Port of Anchorage (POA). According to interviewees, there are one to two movements per year on average, however, only a few military ships a year dock in Anchorage. In the last three or four years, the army has made larger use of commercial "grey bottom" or "roll-on" carriers for their movements (i.e. TOTE and Matson). This is because commercial carriers can prove less expensive for the Army and allow private carriers to fill their back hauls.

Fuel movements to JBER have seen drastic changes in recent years due to the closure of the North Pole Flint Hills refinery. Interviewees indicated that prior to the refinery closure in early May 2014, the Alaska Railroad transported some 1.9 million tons of fuel between Flint Hills, JBER, and Ted Stevens Anchorage International Airport annually. Today, fuel is transported through the POA and exceeds all other cargo tonnage. Tankers coming into the POA have increased from as few as 5 in 2013, to 31 in 2015. In 2016, the POA is expecting 24 to 26 tankers carrying roughly 320,000 barrels of fuel each.

Commodities, bound for the commissary and exchange, are also transported via waterway. Matson and TOTE are the primary container ships servicing the base, alongside a handful of cement and some dry bulk ships. While around 200 TOTE/Matson ships dock at the POA each year, interviewees noted that it is difficult to fully track what portion of a shipment is related to base operations. In recent years, the military has shifted to using non-military spec parts for repairs and maintenance, as well as a number of

other contracted services. This means that a mechanic on base can simply expense a part from a local hardware store, as opposed to having it shipped to the base directly.

Moving and Storage

According to interviewees, the local Alaska military moving and storage industry is especially robust. In locations such as Anchorage, the average family might be deterred from moving non-essential items to the lower 48. However, with financial assistance from the military, Alaska military families tend to move fairly high volumes of belongings per move compared to their civilian equivalents. Another factor that deepens the military's role in the industry is its need for storage. During a deployment, active duty military will often give up their residence and opt to keep their belongings in storage.

Interviewees generally acknowledged that a reduction in military force would result in impacts to the transportation, moving, and storage sector. The study team used allowed moving weights by rank provided by the USARAK (2016), and estimated cost by weight to move freight from Alaska to a variety of locations, to estimate that the moving and storage industry directly associated with the 4-25th could be as large as $29 million annually.

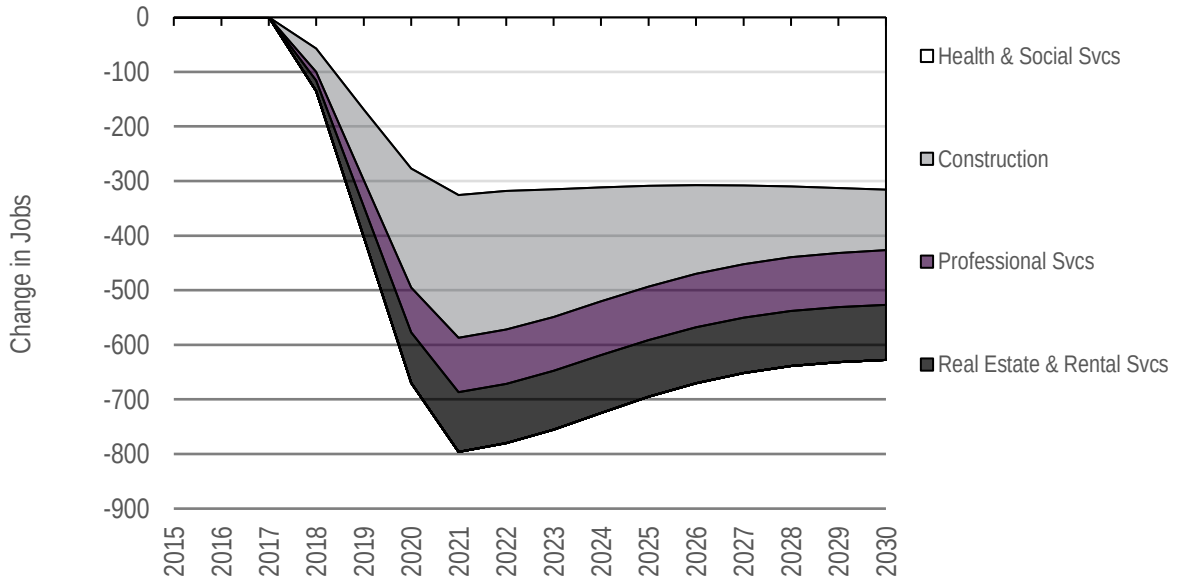
Other independent industry sources estimate that the proposed 4-25th reduction would result in the loss of some 60 jobs across the industry and that companies who provide storage space to the military could be particularly sensitive to a drawdown. This is because losses attributed to annual moves can be offset by a reduction in labor, but storage or a warehouse space is relatively fixed.

5.7 Contractors, Native Corporations, and Other Major Sectors

Some private sector job impacts, such as health care, construction, professional services, and administrative management may be characterized through contracts with JBER. Figure 95 (reproduced, in part, from Figure 58 and Figure 59 in section 4) gives the estimated employment impacts in sectors most commonly contracted out by JBER.[42] In Anchorage, health care, construction, professional services, and real estate represented a loss of roughly 800 jobs in 2020. Impacts in Anchorage remain fairly flat, with the exception of construction jobs, which see a reduction in negative impacts from a loss of 261 in 2020 to 104 in 2030.

[42] It is important to note here that not all of these impacts will be through contract work, as some will be induced affects in the larger Anchorage and MSB economies.

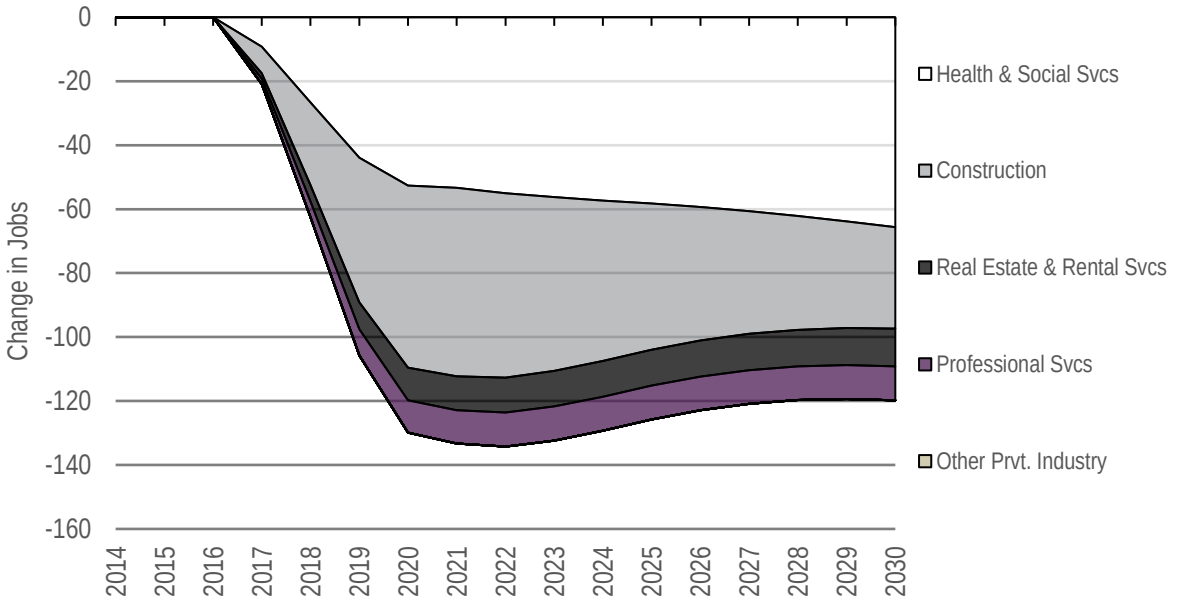
Figure 95. Anchorage Job Impacts Related to Contract Services



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

Job impacts to health and human services, construction, real estate and professional services in the MSB largely follow anchorage in industry order, but with an overall smaller magnitude. Figure 96 shows a negative job impact to the four aforementioned industries in the MSB of just over 130 in 2020. Employment impacts in these sectors decrease to around 120 by 2030.

Figure 96. MSB Job Impacts Related to Contract Services



Note: Assumes the full 2,630 soldier reduction in the 4-25th
Source: Developed by Northern Economics using the Alaska REMI Model.

The project team is aware of $1.2 million in direct local spending by the 4-25th in 2015, of which $785,859 came in the form of vendor contracts (USARAK, 2016). The majority of direct spending was attributed to equipment transportation, portable latrine services, office supplies, facility improvement, and miscellaneous purchases in the local Anchorage and MSB area. In comparison, JBER's contracting efforts represent hundreds of millions of contract dollars annually, many of which are held by Alaska native corporations. A large majority of these contracts are not wholly associated with the 4-25th, but as described in the Alaska REMI model results above, some contracts may be partially impacted into the future as an indirect result of the reduction.

Information regarding military contracts was compiled from the publicly available Federal Procurement Data System. These data, housed by the U.S. General Service Administration, allow users to locate contracts by location, contracting office, place of performance and date signed. At JBER, the 673rd Contracting Squadron is responsible for procuring all contracts for JBER-Richardson and JBER-Elmendorf (JBER, 2009)[43] as well as PACAF Regional Support Eareckson Air Station, Wake Island, King Salmon and 18 Alaskan and Hawaiian radar sites.[44] Table 22 reports historical MOA and MSB based contracts attributed to JBER's 673rd Contracting Squadron signed from 2011–2015.[45] Additionally, the table breaks out the top ten companies annually in terms of contract value and reports any affiliation with Alaska Native corporations.

According to procurement data, from 2011–2015, there were roughly 6,200 contracts held by some 300 MOA and MSB-based companies averaging $180 million annually. The top 10 companies made up roughly 72 percent of total contract value annually. Top Alaska Native Corporations or their affiliates, Arctec Alaska, ASRC Civil Construction, LLC Chugach Federal Solutions, Inc. Eklutna Services, LLC, Alutiiq Diversified Services, LLC, Wolf Creek Federal Services Inc., accounted for 36 percent of total contract value, ranging from radar operations to paving services.

From 2011–2015, contract amounts show a general decline in volume. However, this variation is largely explained by ARCTEC operations and maintenance of the Alaska Radar System, and not likely to be affected by the proposed reduction. Although ARCTEC contracts taper off in 2014 and 2015, a press release from ATCO, a partner in the company along with ASRC, confirms that a new contract will be awarded by the Airforce in 2016 for more than $340 million over a 10 year period (ATCO, 2014).

Table 22. Military Contracts Connected with JBER

Vendor Name	Contract ($Million)	AK Native Corp	Description of Services
2011 Contracts	$229.3		
Arctec Alaska	$43.6	X	Radar and Navigation
Chugach McKinley, Inc.	$20.3		Facilities Operations and Housekeeping
Frawner Corporation	$14.4		Construction and Maintenance - General
Weldin Construction, LLC	$13.6		Construction and Maintenance - General
Shaw Environmental & Infrastructure, Inc.	$13.0		Facilities Operations and Housekeeping
Eyak Technology, LLC	$10.1		Health Care Services
ASRC Civil Construction, LLC	$9.0	X	Construction and Maintenance - Pavement

[43] Prior to 2010, the Regional Contracting Office-Alaska at Fort Richardson handled Army Alaska related procurement.

[44] Elmendorf's PACAF Regional Support extending to Eareckson, Wake Island and King Salmon are included in Table 22.

[45] Based on "Place of Performance".

Vendor Name	Contract ($Million)	AK Native Corp	Description of Services
Chugach Federal Solutions, Inc.	$8.6	X	Wake Island Support Services
Eklutna Services, LLC	$7.1	X	Building Renovation
Elmendorf Support Services	$6.7		Logistics Support
2012 Contracts	$214.0		
Arctec Alaska	$49.5	X	Radar and Navigation
Chugach McKinley, Inc.	$23.7		Facilities Operations and Housekeeping
Frawner Corporation	$13.9		Construction and Maintenance - General
Weldin Construction, LLC	$12.8		Construction and Maintenance - General
SEMCO Energy, Inc.	$12.3		Gas Utility
Chugach Federal Solutions, Inc.	$11.8	X	Wake Island Support Services
ASRC Civil Construction, LLC	$9.2	X	Construction and Maintenance - Pavement
Eyak Technology, LLC	$8.7		Health Care Services
Bam Contractors Inc.	$7.3		Construction and Maintenance - Demolition
GPC Consolidated Reporting	$6.9		Office Supplies
2013 Contracts	$192.4		
Arctec Alaska	$63.1	X	Radar and Navigation
Chugach Federal Solutions, Inc.	$21.0	X	Facilities Operations and Housekeeping
SEMCO Energy, Inc.	$15.1		Gas Utility
Chugach McKinley, Inc.	$13.7		Facilities Operations and Housekeeping
Weldin Construction, LLC	$12.5		Construction and Maintenance - General
Frawner Corporation	$12.3		Construction and Maintenance - General
White Mountain Construction, LLC	$6.5		Construction and Maintenance - General
ASRC Civil Construction, LLC	$4.1	X	Construction and Maintenance - Pavement
Shaw Environmental & Infrastructure, Inc.	$3.0		Facilities Operations and Housekeeping
Lage Business Consolidated & Reporting	$2.3		Office Supplies
2014 Contracts	$144.5		
Chugach Federal Solutions, Inc.	$29.0	X	Facilities Operations and Housekeeping
Frawner Corporation	$18.2		Construction and Maintenance - General
ASRC Civil Construction, LLC	$17.3	X	Construction and Maintenance - Pavement
SEMCO Energy, Inc.	$12.1		Gas Utility
White Mountain Construction, LLC	$7.9		Construction and Maintenance - General
Weldin Construction, LLC	$5.6		Construction and Maintenance - General
Global Management Services, LLC	$4.0		Facilities Operations and Housekeeping
Alutiiq Diversified Services, LLC	$3.9	X	Construction and Maintenance - General
ASSETS, Inc.	$3.9		Facilities Operations and Housekeeping
MOA	$3.5		Electric Utility
2015 Contracts	$120.8		
Chugach Federal Solutions, Inc.	$36.6	X	Facilities Operations and Housekeeping
SEMCO Energy, Inc.	$13.2		Gas Utility
MOA	$12.0		Electric Utility
Weldin Construction, LLC	$8.0		Construction and Maintenance - General
Wolf Creek Federal Services Inc.	$4.8	X	Facilities Operations and Housekeeping
Frawner Corporation	$3.9		Construction and Maintenance - General

Vendor Name	Contract ($Million)	AK Native Corp	Description of Services
ASSETS, Inc.	$3.0		Facilities Operations and Housekeeping
Medical North America JV	$2.7		Health Care Services
ASRC Civil Construction, LLC	$2.6	X	Construction and Maintenance - Pavement
White Mountain Construction, LLC	$2.4		Construction and Maintenance - General

Source: Federal Procurement Data System (2016)

6 Recommendations for Mitigating Impacts of the Proposed Force Reduction.

In Section 6.1 has compiled recommendation for mitigation impacts from the public obtained through the Stakeholder and Public Process described in Section 1.2.1starting on page 3. Using these public inputs as a starting point, along with the findings and conclusions of the report, input from the BEAR Working Group and the Municipality, Section 6.2 will (when it is completed) summarize a final set of recommendations to mitigate impacts from the proposed force reductions.

6.1 Recommendation from Public Process

Reconsideration of Reduction

Many expressed the hope that the military would reconsider the reduction or that the Alaska delegation would find ways to reaffirm Alaska as a strategic stronghold for a military base in a time of growing threats in the Pacific Rim. Participants offered a complex set of views on the strategic importance of the JBER forces in Alaska, and how it might be better to place military forces and infrastructure out of range of Anchorage in case of attack.

Staggering the Force Reduction and Extending the Time Frame for One-Time Move

Respondents suggested that a more gradual reduction in forces would give time for adjustments. The impact would not be as great if the forces were not all moved at one time. Extending the timeframe would give military families enough time to consider their options, including leaving the military to remain in Anchorage.

Reuse of Facilities for Other Military Purposes

Some respondents suggested that facilities should be used for other purposes, and Army personnel could be redirected to other duties at JBER. One participant suggested increasing the presence of the Air Force to take up the slack. Another person suggested bringing the Navy to the area.

Reuse of Facilities for Civilian Purposes

It was suggested to repurpose the vacated space at JBER. Several ideas were proposed, some of which may not be realistic: examples of the latter include a suggestion to relocate the capital from Juneau or to find some other industrial use for the land.

Use of Citizen Task Force

One idea called for the Municipality to convene a "task force" of citizens to make site visits to see the outcomes at other bases where closures or other force reductions have occurred. By looking other areas of the country the MOA could identify ideas for reuse of facilities.

Offering Incentives for Business

One commenter at a public meeting suggested the MOA could offset potential impacts by offering other incentives, like tax incentives, to bring new industries and businesses to Anchorage.

Job Training

Respondents suggested that providing additional job training opportunities through the MOA or others would be helpful. This could help civilians, military service members, military dependents, and veterans in the workforce find alternate employment if their jobs would be affected by a force reduction.

Regulatory Relief

Most agreed that there were not a lot of options for the retail sector to respond to a reduction in Army forces. The effects of the potential reduction have already started to occur due to the uncertainty that

many military members are facing now. People are holding off on large purchases such as vehicles and household goods. The retail sector, especially the food and beverage small businesses, cannot plan ahead for a downturn. If it comes, they must cut costs quickly, primarily through a decrease in the workforce. Since they operate on very narrow margins, many would tip towards closure. Participants stated that regulatory relief might be a tool to reduce impacts. However, they felt that the food and beverage sector was unlikely to get positive consideration for regulatory control reduction, such as relaxing the prohibitions against bar happy hours.

Guidance/Assistance from Alaska Native Corporations

Participants reported that the growth of Alaska Native Corporations may be able to help offset the impacts to the economy of a drawdown. CIRI is a big investor of housing in the Muldoon area. Urban relocation from rural Alaska would be an intersecting trend.

Reallocation of Lands

Some participants were well-versed in long-standing discussions about reductions in the land base at JBER-Richardson under the North Anchorage Land Agreement. Several winter sports organizations, including Nordic skiing, downhill skiing, and biathlon, would be able to expand programs if military lands were made available. Alternatively, new use agreements might provide for increased use of military lands for these civilian recreational activities. There may be an increased demand for winter recreation in high elevation areas, such as Arctic Valley, if a changing climate leads to less snow or warmer temperatures at low elevation recreation sites in Anchorage.

New Sources of Revenue

Some participants stated that they may plan for a force reduction by coming up with new revenue sources. Examples were expanding markets or offering more products that can be obtained through the internet, such as online retail and, in the case of higher education, providing more opportunities for online enrollment.

Regular Communication and Coordination

Some respondents suggested that the Municipality and 4-25th ABCT communicate and coordinate on a regular basis regarding the status, timing, and magnitude of potential force reduction. This would allow the MOA to provide information to public and private stakeholders for planning purposes and responding to impacts resulting from force reduction. It would also facilitate consideration of other measures that could mitigate adverse impacts.

6.2 Recommendations from the Project Team

Table 23 on pages 128–131, provides recommendations and strategies for the Municipality of Anchorage (MOA), the State of Alaska, the Joint Base Elmendorf-Richardson (JBER), or other organizations in the community to mitigate potential impacts that could occur as a result of a force reduction on the base. The strategies presented in the table were developed following a stakeholder engagement study that held public meetings, held focus groups, and conducted key informant interviews to understand the effects that a potential force reduction would have on the community and businesses. This study is documented in the Stakeholder Engagement Summary Report.

The implementation actions in the table fall into three categories:

- Data Collection and Forecasting. Actions that can be taken by to collect data that would be useful for planning purposes, or which could improve assessments of potential future impacts.
- Communication and Coordination. Actions to facilitate open communication between stakeholders.
- Response Action. Actions to take in the event of a force reduction.

In addition to providing actions, the table suggests a relevant time frame for implementing each action: ongoing (actions that should be implemented immediately and continue forward regardless of base closure status) short-term (actions that can be implemented in 1 to 3 years), intermediate (3 to 10 years), and long-term (10+ years). The entity that would be most effective to implementation is suggested as well.

Finally, other recommendations were made by the general public and other stakeholders that may not be feasible at this time but could be considered in the future. These are listed at the end of this section.

Table 23. Recommendations and Strategies to Mitigate Potential Impacts of Force Reduction

ID	Implementation Actions	Time Frame	Responsible Entity
Data Collection and Forecasting			
Data Collection and Forecasting Objective #1 – Improve data availability for assessment of economic impacts and revisit the assumptions in the model.			
D-1	**Military Assistance with School District Survey Response** School districts rely on military personnel response to surveys to get additional funding for military dependents. The military could help the school district with improving survey responses.	Short term	JBER
D-2	**Develop a procedure for collecting service members' physical addresses while stationed at JBER, annually updating this information, and sharing aggregate information with community representatives.** Relevant information would be shared for local planning decisions, such as additional population per zip code, consistent with privacy and force protection concerns. Information on the physical location of service members helps affected communities plan for housing, schools, transportation, and other off-post requirements in support of installations.	Short term	JBER
Data Collection and Forecasting Objective #2 – Revisit the assumptions in the REMI model.			
D-3	**Develop a procedure for generating and providing data on high-level operational expenses for individual units at JBER (such as the 4-25th).** Future estimates of the economic contributions, or on the impacts of force reductions or even a base closure would be improved if there were better data on operational expenditures, even if these data were generalized. On an annual basis, the military could provide summarized expenditures for fuel, food, transportation, parts and services associated with local companies.	Ongoing	JBER
D-4	**Provide regular data updates on assigned strength levels for all units at the base and their demographics.** Include number of soldiers, number accompanied vs. unaccompanied and number of associated children by age group broken out by Army and Airforce units.	Ongoing	JBER

ID	Implementation Actions	Time Frame	Responsible Entity
Communication and Coordination			
Communication and Coordination Objective #1 – Communicate/ advocate the military value that JBER's military installations, units, and associated mission sets provide to the DOD and Alaska.			
C-1	**Continue to monitor, inform, and shape Department of the Army deliberations over the future of forces at JBER.** This could include specific staff assignments at the MOA, State and congressional delegation levels devoted to coordinating and focusing Alaska and Anchorage's relationships with the defense-related economy. Communication should be done with the concepts of military defense policy and the DOD decision making processes in mind.	Ongoing	MOA State of Alaska Congressional Delegation
C-2	**Proactively monitor the national political climate on the DOD budget reductions, force structure realignments, and strategy changes.** This would potentially provide advanced notice of funding and force reduction proposal and allow time to react.	Ongoing	MOA State of Alaska Congressional Delegation
C-3	**Establish an umbrella organization (or repurpose and existing organization), such as a JBER Citizen Task Force, to strengthen the shared goals of military supporters.** In the case of a drawdown, establish a Local Redevelopment Authority (LRA) with representatives from local governments, federal agencies, the private sector, state government, and tribal entities as appropriate.	Short-term	MOA
Communication and Coordination Objective #2 – Support successful contract bids and defense-related business opportunities.			
C-4	**Include national defense in the MOA's and State's economic development strategy**. Making national defense an explicit focus in the MOA's and State's economic development strategies will ensure defense-related issues are integrated and elevated into economic development decision making processes.	Intermediate	MOA State of Alaska
C-5	**Support local economic development efforts to market the defense sector by sharing information, analysis, and opportunities with the Anchorage Chamber of Commerce, Anchorage Economic Development Corporation, and other economic development partners.** Support of the defense-related economy can be done at the local level from the bottom-up. Existing and new businesses catering to JBER and the defense industry will benefit from information provision and collaboration.	Short-term	MOA
C-6	**Increase business training and online resources.** The MOA could provide technical assistance to smaller firms seeking military contracts or responding to potential effects of realignment. The MOA and State of Alaska could also provide online access to training materials and toolkits with information on defense industry business opportunities.	Intermediate	MOA State of Alaska UAA
C-7	**Develop a workforce with skills in aerospace and high technology.** Cyber and unmanned aerial system (UAS) opportunities are two trending development areas in the DOD and the defense industry. Higher education, the State of Alaska, and MOA can work to attract talent and provide opportunities for training in these fields.	Intermediate	MOA State of Alaska UAA

ID	Implementation Actions	Time Frame	Responsible Entity
C-8	**Provide political support and funding to accelerate military facilities upgrades.** Alaska offers unique space for training ranges. This could align with Alaska Railroad Corporation facility improvements and the State of Alaska's Roads to Resources program, and follow a rational of access improvements to military areas.	Long-term	State of Alaska
Communication and Coordination Objective #3 – Communicate and coordinate options for military families, small business owners, and contractors potentially affected by a force reduction.			
C-9	**Stagger the Force Reduction and Extend the Timeframe for Military Personnel to Use Their One-Time Move.** A more gradual reduction in forces would give time for adjustments. The impact would not be as great if the forces were not all moved at one time. Extending the timeframe for military personnel to use their one-time move would give military families enough time to consider their options, including leaving the military to remain in Anchorage	Intermediate	JBER
C-10	**Educate Homeowners Who Would Need to Sell Their Property.** The Municipality could partner with the Alaska Housing Finance Corporation and Native Corporations to offer classes and workshops to military families who may need to sell their homes quickly.	Intermediate	MOA JBER
C-11	**Pursue educational and other relevant funding for individuals.** Funding sources could include Title IV of the Higher Education Act and vocational education programs under the Car D. Perkins Vocational and Technical Education Act, the DOD programs, National Emergency Grant Funding, and Housing Authority programs.	Long-term	MOA
Communication and Coordination Objective #4 – Obtain funding to carry out adjustment strategies in the event of a force reduction at JBER.			
C-12	**Pursue funding for local and state governments with the Office of Economic Adjustment.** Other funding opportunities may be with the Community Development Block Grants Program of the Department of Housing and Urban Development, Federal Airport Improvement Program of the Federal Aviation Administration,	Long-term	MOA
Response Action			
Response Action Objective #1 – Facilitate alternative DOD uses of the facilities at JBER should force reduction result in surplus facilities and lands.			
R-1	**Expand the Air Force units or increase the use of JBER as a training facility.** The existing Air Force facilities and units could expand into Army areas. Vacated Army facilities could also be repurposed as additional DOD training or off-site amenity areas.	Intermediate	JBER MOA

ID	Implementation Actions	Time Frame	Responsible Entity
Response Action Objective #2 – Facilitate alternative citizen, agency, and organizational uses of the facilities at JBER.			
R-2	**Allow citizens or contractors to rent housing or office facilities at JBER.** If forces were reduced at JBER, facilities could be repurposed by allowing private citizens and businesses and government agencies to rent structures on parts of the base.	Intermediate	JBER MOA
R-3	**Support increased recreational uses at JBER.** Improve access and trails for hiking, skiing, and other outdoor recreation activities by citizens.	Intermediate	MOA JBER

6.2.1 Recommendations for the Municipality with Potential Future Feasibility:

Offer Incentives for New Businesses

The Municipality could offset potential impacts by offering tax incentives to bring new industries and businesses to Anchorage to offset potential losses associated with Force Reduction.

Facilitate Continued Education Opportunities for Relocated Military Personnel

Provide military personnel with UAA/AVTEC opportunities for online or virtual classroom-based learning system to continue their educations.

Guidance/Assistance from Alaska Native Corporations

The growth of Alaska Native Corporations may be able to help offset the impacts to the economy as a result of a drawdown. For example, CIRI is an investor in housing and business in the Muldoon area. Response to urban relocation from rural Alaska would be an intersecting trend for consideration.

Reuse of Facilities for Civilian Purposes

Consider reuse and/or repurpose of the vacated space at JBER. Several ideas were proposed, some of which may not be feasible. Relocate the capital from Juneau or find some other industrial use. Recreational uses, such as a Nordic skiing facility, could also repurpose land and facilities. Homeless shelter providers and affordable housing could also be given priority for surplus JBER properties.

Reallocation of Lands

Revisit the North Anchorage Land Agreement to discuss the potential for change in landownership of JBER property associated with the 4-25th ABCT Force Reduction should it be considered surplus.

Add Navy or Coast Guard units and facilities at JBER

If there is a reduction in Army force, there could be an opportunity to place Navy or Coast Guard units in Anchorage. With increased ship traffic in the Arctic, Anchorage could offer a strategic military defense location for water-based activities.

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Appendix A. Unit Level Details of the 4-25th under Alternative Configurations

This appendix provides details of the number of soldiers by category in each of the seven units within the 4-25th under four different strength levels: 1) Current TOE, 2) ASL as of May 2016, 3) As assumed with the Validated ATF, 4) as assumed with the full reduction. In all cases estimates of payroll include the Alaska COLA, monthly jump pay, Basic Allowance for Subsistence (BAS), and Basic Allowance for Housing (BAH).

Table 24. The 4-25th Brigade HHC under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	40	$5,065,243	37	$4,723,423
Warrant Officers	15	$1,613,385	14	$1,510,637
Enlisted Soldiers	92	$7,313,011	87	$6,920,612
4-25th Brigade HHC	147	$13,991,640	138	$13,154,672

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 25. The 4-25th Brigade HHC and Assumed TOEs under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	29	$3,747,464	21	$2,737,355
Warrant Officers	12	$1,311,267	10	$1,118,057
Enlisted Soldiers	65	$5,192,694	49	$3,918,375
4-25th Brigade HHC	106	$10,251,426	80	$7,773,786

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 26. The 1st Battalion (Airborne), 501st Infantry under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	42	$4,593,903	39	$4,300,431
Warrant Officers	0	$0	0	$0
Enlisted Soldiers	612	$39,349,275	572	$36,804,267
1st Battalion (Airborne), 501st Infantry	654	$43,943,178	611	$41,104,698

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 27. The 1st Battalion (Airborne), 501st Infantry under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	The entire unit would be cut		42	$4,687,930
Warrant Officers			0	$0
Enlisted Soldiers			612	$39,546,469
1st Battalion (Airborne), 501st Infantry			654	$44,234,399

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 28. The 3rd Battalion (Airborne), 509th Infantry under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	42	$4,593,903	39	$4,300,431
Warrant Officers	0	$0	0	$0
Enlisted Soldiers	612	$39,349,275	572	$36,804,267
3rd Battalion (Airborne), 509th Infantry	654	$43,943,178	611	$41,104,698

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 29. The 3rd Battalion (Airborne), 509th Infantry under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	42	$4,687,930	The entire unit would be cut	
Warrant Officers	0	$0		
Enlisted Soldiers	612	$39,546,469		
3rd Battalion (Airborne), 509th Infantry	654	$44,234,399		

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 30. The 1st Squadron (Airborne), 40th Cavalry under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	32	$3,563,252	30	$3,367,694
Warrant Officers	0	$0	0	$0
Enlisted Soldiers	337	$22,185,403	314	$20,686,352
1st Squadron (Airborne), 40th Cavalry	369	$25,748,655	344	$24,054,046

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 31. The 1st Squadron (Airborne), 40th Cavalry under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	The entire unit would be cut		The entire unit would be cut	
Warrant Officers				
Enlisted Soldiers				
1st Squadron (Airborne), 40th Cavalry				

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 32. The 2nd Battalion (Airborne), 377th Field Artillery under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	50	$5,485,537	47	$5,198,306
Warrant Officers	4	$426,629	4	$427,992
Enlisted Soldiers	455	$30,522,647	424	$28,463,840
2nd Battalion (Airborne), 377th Field Artillery	509	$36,434,813	475	$34,090,138

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 33. The 2nd Battalion (Airborne), 377th Field Artillery under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	The entire unit would be cut		The entire unit would be cut	
Warrant Officers				
Enlisted Soldiers				
2nd Battalion (Airborne), 377th Field Artillery				

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 34. The 6th Brigade Engineering Battalion (Airborne) under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	34	$3,780,330	32	$3,586,869
Warrant Officers	8	$825,848	8	$828,486
Enlisted Soldiers	373	$24,949,753	347	$23,227,568
6th Brigade Engineering Battalion (Airborne)	415	$29,555,931	387	$27,642,923

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 35. The 6th Brigade Engineering Battalion (Airborne) under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	34	$3,857,704	The entire unit would be cut	
Warrant Officers	8	$839,003		
Enlisted Soldiers	373	$25,074,786		
6th Brigade Engineering Battalion (Airborne)	415	$29,771,493		

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

Table 36. The 725th Brigade Support Battalion (Airborne) under Current TOEs and ASL (May 2016)

Strength Level	Current TOE		ASL as of May 2016	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	63	$7,061,782	59	$6,667,156
Warrant Officers	17	$1,782,248	16	$1,682,768
Enlisted Soldiers	763	$50,764,394	710	$47,272,639
725th Brigade Support Battalion (Airborne)	843	$59,608,424	785	$55,622,563

Source: Developed by Northern Economics based on data from USARAK (2016).

Table 37. The 725th Brigade Support Battalion (Airborne) under Alterative Reduction Options

Strength Level	Validated ATF		Full Reduction ATF	
Category	Soldiers	Annual Payroll	Soldiers	Annual Payroll
Officers	43	$4,918,599	29	$3,346,134
Warrant Officers	12	$1,278,096	7	$762,841
Enlisted Soldiers	366	$24,472,973	190	$12,717,148
725th Brigade Support Battalion (Airborne)	421	$30,669,669	226	$16,826,123

Source: Assumptions by Northern Economics based on information from USARAK (2016) and Parker (2016).

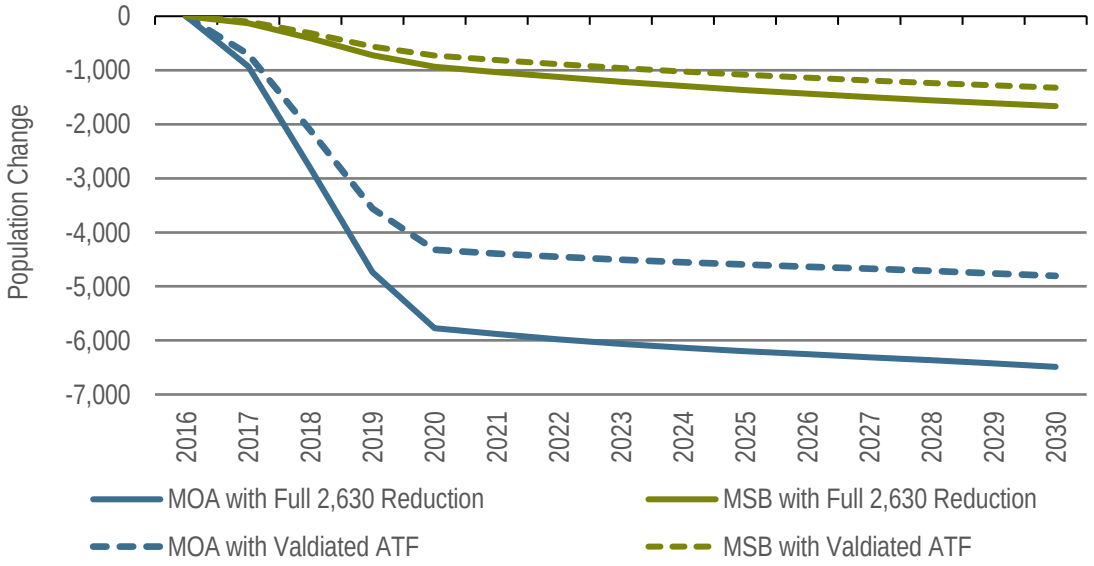
Appendix B: Major Indicators Forecasted using Validated ATF

As discussed in detail in section 2.1.2.1 and mentioned in Section 4, the project team evaluated an alternative reduction scenario in which the 4-25th is reduced from 3,590 soldiers to the "validated" ATF levels of 1,597, or a reduction of 1,993 soldiers as opposed to the 2,630 used in the primary analysis. High level results are presented here as a means to compare and contrast with the full reduction impacts using the same REMI baseline.

The difference in total population reduction associated two scenarios is presented in Figure 97. In the MOA, the total change in individuals with the full reduction by 2020 is 5,771, while the change under the validated ATF reduction would be substantially lower at 4,324 individuals. Impacts are projected to deepen in the MOA under both scenarios into 2030, with the full reduction impacts totaling 6,489 and the validated ATF yielding 4,805 fewer people than in the baseline scenario. We reiterate here that total population in the MOA and continues to increase under both scenarios, albeit at a slower rate than in the baseline.

When the broader MSB region is taken into consideration, the MSB's population is expected to decline by 936 individuals by 2020 under the full reduction. Under the validated ATF reduction, the total population of the MSB is projected to decline by 730 individuals by 2020. By 2030, the full reduction and validated ATF scenarios report a loss of 1,664 and 1,322 respectively. As with the MOA, total population in the MSB, with either scenario continue to increase overall, but less so than if there were no reductions.

Figure 97. Population Change for Full and Validated ATF in the MOA and MSB

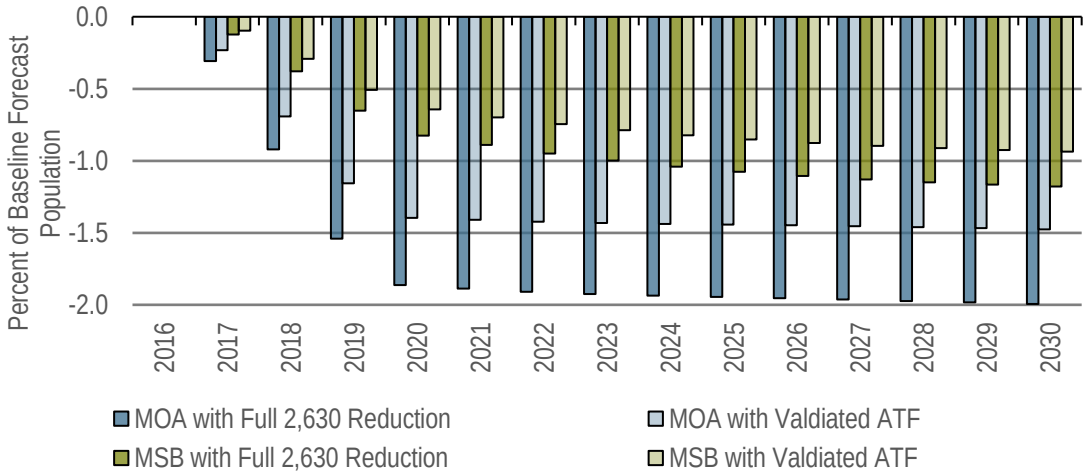


Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 97 presents a graphical representation of the annual percentage change from the baseline forecast that is projected to occur under the full reduction and the Validated ATF reduction for the MOA and the MSB. At the MOA level, the full reduction would result in a decline in the projected population of 1.9 percent by 2020 remaining flat into 2030. The Validated ATF reduction in this region would result in a decline in the projected population of 1.5 percent by 2030. Within the MSB, the full reduction would result in relatively low percentage declines in the first few years of the drawdown, but

would decline to nearly 1.5 percent by 2030. Within the MSB, the validated ATF reduction has the lowest percentage decline, reaching just under 0.9 percent by 2030.

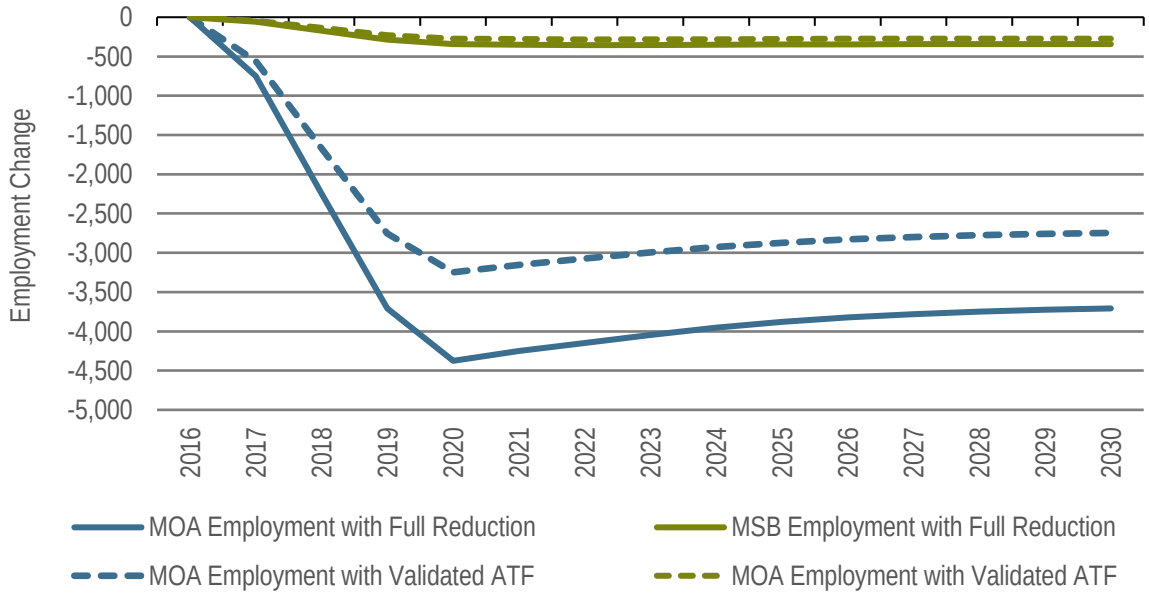
Figure 98. Percent Change from Baseline Population Full Reduction and Validated ATF



Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 99 presents the changes in the total number of employed individuals with the full reduction of 2,630 soldiers, and also shows changes if the 4-25th is downsized to levels in the Validated ATF. For the MOA, a 4 decline in employment is forecast under the full reduction by the year 2020. The forecast decline has a smaller magnitude (3,248) under the validated ATF reduction. Employment reductions in the MSB are substantially less, with a forecast employment reduction of 344 under the full force reduction by year 2020. With smaller force reductions down to levels of the validated ATF, employment is projected to decline by 274 compared to the baseline.

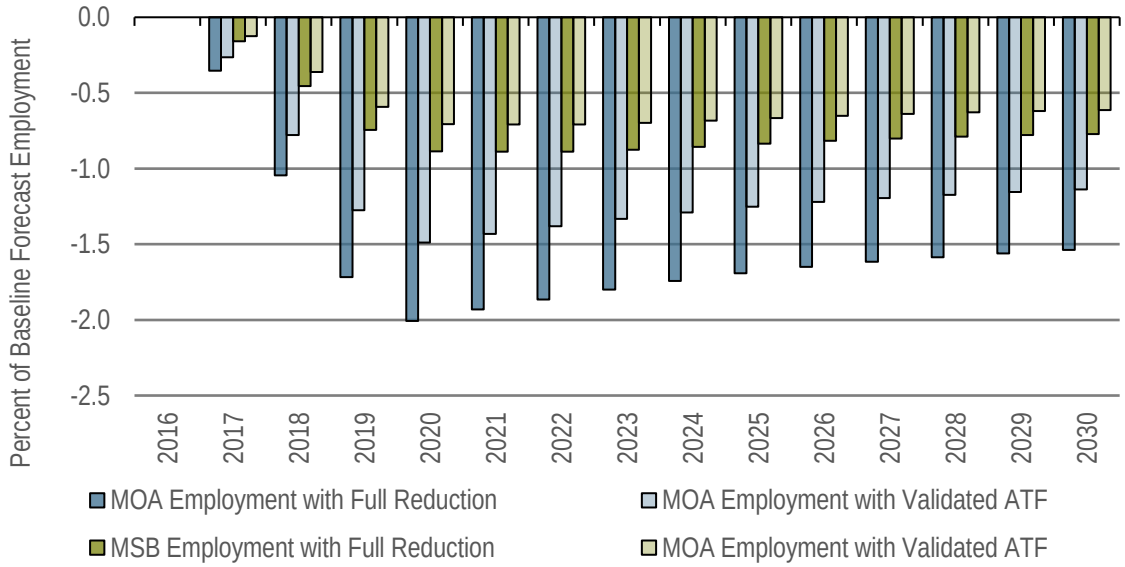
Figure 99. Employment Change for Full and Validated ATF in the MOA and MSB



Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 100 presents the annual percentage change in employment from the baseline forecast that is projected to occur under the full reduction and with a reduction to the Validated ATF in both the MOA and MSB. In the MOA, the full reduction would result in a decline in the projected employment of 1.9 percent by 2020 before the magnitude of the percentage change diminishes to 1.5 percent by 2030. Under the validated ATF reduction, employment in the MOA would decline by 1.5 percent by 2020 before moderating to a decline of 1.1 percent by 2030. Within the MSB, the full force reduction results in a less drastic decline relative to the MOA over time, falling just 0.8 percent by 2020 and remaining there through 2030. With the smaller force reductions to the Validated ATF, employment in the MSB falls by 0.7 percent by 2020 and continues this way into 2030

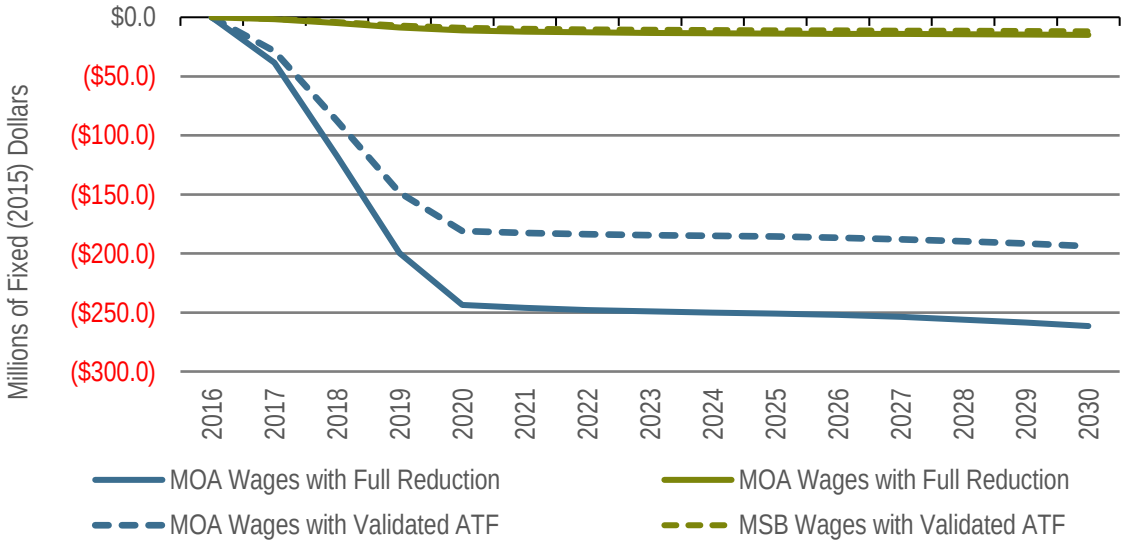
Figure 100. Percent Change from Baseline Employment Full Reduction and Validated ATF



Source: Developed by Northern Economics using the Alaska REMI Model.

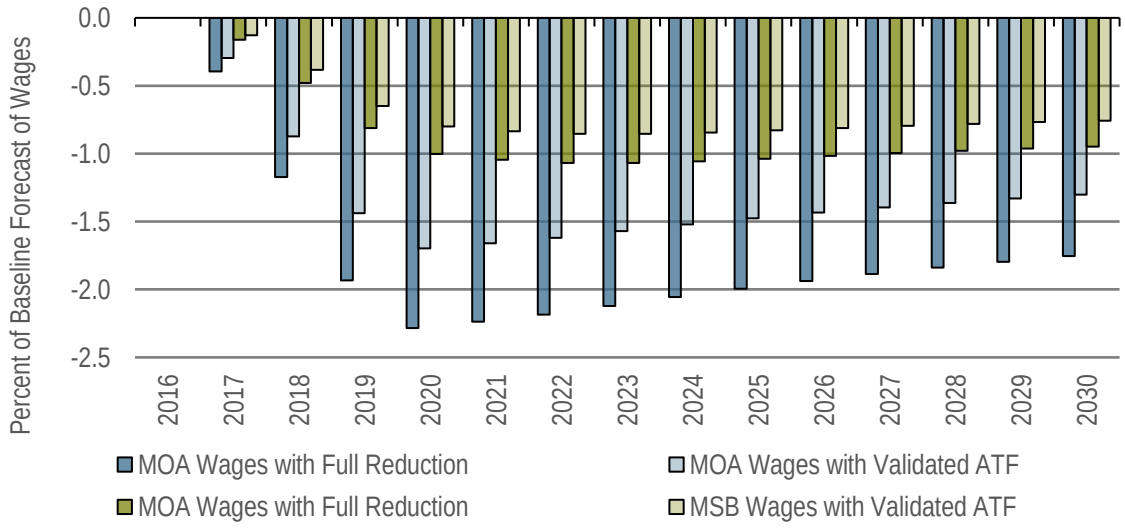
Figure 101 shows the difference in the total amount of wages and salaries with the full reduction and the Validated ATF. For the MOA, wages and salaries are projected to fall by $243.6 million under the full reduction by 2020; with the Validated ATF, declines in wages and salaries in 2020 would be smaller—$180.9 million less than baseline forecasts. In the MSB, wage and salary reductions are substantially smaller—the total reduction is $11.2 million by 2020 relative to the baseline, and $8.9 million less than the baseline if the 4-25th is downsized to the Validated ATF. In terms of annual percentage changes, the full reduction would result in a decline in the projected wages in the MOA of over 3 percent by 2020, although the decrease is closer to 1.7 percent by 2030 (Figure 102). In contrast, wages under the Validated ATF are 1.7 and 1.3 percent lower in 2020 and 2030 respectively.

Figure 101. Changes in Wages and Salaries with the Full Reduction and Validated ATF in the MOA and MSB



Source: Developed by Northern Economics using the Alaska REMI Model.

Figure 102. Percent Change from Baseline Wages and Salaries with the Full Reduction and Validated ATF



Source: Developed by Northern Economics using the Alaska REMI Model.

Appendix C: Calculation of School Attendance and Impact Aid Calculations

This appendix documents the derivation of estimates of the number of students associated with the 4-25th that attend schools in the MOA and the MSB. The second section of the appendix describes the calculations of Federal Impact Aid provides to ASD primarily as a result of the fact that JBER lies within MOA boundaries.

Derivation of Estimates of Children from the 4-25th Attending ASD and MSBSD Schools

Table 38 provides a summary of the data use to estimate the number student associated with the 4-25th that attend school in the ASD and the MSBSD.

The study team had three sources of data on school children:

1) USARAK estimates of dependent children by split into three age groups (USARAK, 2016) for both USARAK as a whole and for the 4-25th. The age groups: 1) ages 0–5, 2) 6–12, and ages 12–18. These data do not distinguish between the MOA and the MSB.
2) Estimated counts of students attend schools in the ASD with one or more parent who can document they were active duty soldiers associated with the U.S. Army. Because these data form the basis for Federal Impact Aid payments, these data are fairly rigorously checked and verified by ASD.
3) Estimated counts of students attending MSBSD schools indicating that one or both parents are on active duty with the U.S. Military. The MSBSD does not receive Federal Impact Aid payments, and thus they do not actively verify the accuracy of registration data with respect to active duty status.

The study team used the following process to determine the number of students in the MSB:

1) Using data from USARAK (2016), estimate the number of dependent school-age children associated with USARAK and separately with the 4-25th assuming: a) 1/6th of all children Ages 0–5, b) all children Ages 6–12, and c) 91.67 of children in the Age 13-18 cohort.
2) Calculate the 4-25th percentage of total USARAK students (71 percent)
3) Subtract the total number of USARAK students attending ASD schools (1,600) from the total number of USARAK Students (i.e. 2,200 – 1627 = 573). The result is the number of students attending school outside ASD
4) Multiply this number by the result in #2 (573 × 71% = 406). This is number of 4-25th children assumed to attend school in the MSB.
5) Subtract this number from the number of total 4-25th students (1,558 – 406 = 1,152). The result is the number of 4-25th students attending ASD schools.

Table 38. Derivation of Estimates of Children from the 4-25th Attending ASD and MSBSD Schools

Category	4-25th Total Children	NEI Estimates of School Age Children of 4-25th	4-25th Students as a Percent of USARAK	USARAK Total Children	NEI Estimates of School Age Children of USARAK
# children 0-5	1,200	200	75	1,600	267
# children 6-12	900	900	75	1,200	1,200
# children 13-18	500	458	63	800	733
All Children	2,600	1,558	71	3,600	2,200
Attend ASD Schools*		1,152	71		1,627
Attend School Elsewhere (i.e. MSBSD)		406	71		573

Note: The total shown for USARAK attending ASD schools reflect data obtained from ASD (2016). Numbers of total children by age group are data from USARAK (2016).

Federal Impact Aid to Schools

Several sources of data informed the impact aid calculations:

1. The federal impact aid basic support payment formula comprises of multiple components which are defined in the impact aid glossary (DOE, 2016) as:
    a. Membership: The unduplicated count of students on the roll of the local education agency on the survey date
    b. Attendance ratio: Average daily attendance of prior year divided by total membership in the prior year.
    c. Student Weight: These are applied to each student type to reflect varying levels of federal connection.
    d. Local Contribution Rate (LCR): The estimated local share of the cost of elementary and secondary education. In Anchorage, the LCR is equal to one half of the states average per-pupil expenditure for the third preceding fiscal year.
    e. Learning Opportunity Threshold (LOT) Percentage Paid: payment proration based on the annual appropriation for Impact Aid
2. Data and field ranges were largely provided from FY 2014 Impact Aid vouchers provided by the ASD (2016a) and the Alaska State Department of Education (2016a). Individual vouchers are submitted quarterly to account for fluctuation in data and other variables within a given year. The project team chose a single 2014 voucher from the ASD and JBER or "State" LEA's (shown below in Figure 104 and Figure 105) for inputs into the initial baseline model. It is important to note that student counts verified for federal impact aid may differ from other student counts reported by the ASD's student information system.
3. Model results were calibrated to match the FY 2014 foundation report figures provided by the ADEED (2014). As a result, the static numbers used in the model are an approximation.
4. Overall logic of the impact aid calculation came from Figure 103 along with input from the ASD (2016a) and ADEED (2016d).

Figure 103. Impact Aid Calculations

TITLE VIII – IMPACT AID

Calculation of Basic Support Payment Maximum Amounts Under Section 8003(b)(1)(C)

STEP 1	X	STEP 2	=	STEP 3
Total weighted student units determined under 8003(a)(2)	multiplied by	Local Contribution Rate (LCR)	equals	Maximum Amount
WHICH IS THE SUM OF THE PRODUCTS OF:		WHICH IS THE GREATER OF:		

the number of children in ADA by category	X	factors	one-half the State average per-pupil expenditure for the third preceding fiscal year OR one-half the national average per-pupil expenditure for the third preceding fiscal year OR the comparable LCR computed by the State and approved by the Impact Aid Program OR the State average per-pupil expenditure multiplied by the local contribution percentage
resided on Federal property and parent was employed on Federal property in the school district	multiplied by	1.0	
resided on Federal property and parent was an accredited foreign military official		1.0	
resided on Federal property and parent was in the uniformed services of the United States		1.0	
resided on Indian lands		1.25	
parent was in the uniformed services of the United States		0.20	
parent was an accredited foreign military official		0.20	
resided in low-rent housing		0.10	
resided on Federal property		0.05	
parent was employed on Federal property in county		0.05	
parent was employed on Federal property out of county		0.05	

TITLE VIII – IMPACT AID

Calculation of Learning Opportunity Threshold (LOT) Payments Under Section 8003(b)

STEP 1	X	STEP 2							=	STEP 3
Basic Support Payment Maximum Amount Determined under section 8003(b)(1)(C)	multiplied by	LOT Percentage (not to exceed 100 percent)							equals	LOT Payment (which may be prorated if insufficient funds are appropriated)
		Percentage of federally connected children			plus	Percentage of budget				
		Federally connected children in ADA	divided by	Total district children in ADA		Basic Support Payment Maximum Amount	divided by	Total Current Expenditures		

Figure 104. Anchorage LEA Impact Aid Voucher

U.S. DEPARTMENT OF EDUCATION
OFFICE OF ELEMENTARY AND SECONDARY EDUCATION
IMPACT AID PROGRAM
WASHINGTON, D.C. 20202-6244

VOUCHER FOR IMPACT AID SECTION 8003 PAYMENTS
(TITLE VIII of the Elementary and Secondary Education Act)

Voucher Numbers	Fiscal Year	Date
339248 2014-2	2014	03/09/2016

Total ADA	Total Membership	Application Number
45,360.53	48,801	11-AK-2014-1605

Local Contribution Rate & Type	Total Current Expenditures
$8,838.50 1/2 State Average	$686,566,000.00

Anchorage School District
Attention: Ms. Marie Ochadleus
5530 E. Northern Lights
Anchorage, AK 99504-3135

Grantee
DUNS Number: 15-040-4523

Payee
DUNS Number: 15-040-4523

PR/Award#: S041B-2014-0133

Pay Type: Final After Field Review

County: Anchorage

Negotiated Ratio	Attendance Ratio = Prior-Year ADA / Prior-Year Membership	LOT% = TCE% + Membership%
0.92950	= / 48,756	5.25% = 0.51% + 4.74%

SECTION 8003(b) BASIC SUPPORT PAYMENT — LOT Percent Paid: 91.7300%

Category	Membership	ADA	Weight	WSU	Max BSP	Full LOT	Prorated LOT
(A) (i)	0	0.00	1.00	0.00	$0.00	$0.00	$0.00
(A) (ii)	0	0.00	1.00	0.00	$0.00	$0.00	$0.00
(B)	0	0.00	1.00	0.00	$0.00	$0.00	$0.00
(C)	0	0.00	1.25	0.00	$0.00	$0.00	$0.00
(D) (i)	1,985	1,845.06	0.20	369.01	$3,261,494.89	$171,228.48	$157,067.88
(D) (ii)	0	0.00	0.20	0.00	$0.00	$0.00	$0.00
(E)	328	304.88	0.10	30.49	$269,485.87	$14,148.01	$12,977.97
(F)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
(G) (i)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
(G) (ii)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
8003(b) Total	2,313	2,149.94		399.50	$3,530,980.75	$185,376.49	$170,045.85
(A) (ii)	0	0.00	1.00	0.00			$0.00
(B)	0	0.00	1.00	0.00			$0.00
(C)	0	0.00	1.00	0.00			$0.00
(D) (i)	197	183.11	0.50	91.56			$104,744.64
(D) (ii)	0	0.00	0.50	0.00			$0.00
8003(d) Total	197			91.56	CWD Rate Paid: $1,144.00/WSU		$104,744.64

8003(d) Maximum:	**8003(d) Reduction**
8003(e) Hold Harmless	$0.00
8003(b)(2) Heavily Impacted Local Educational Agency:	
8005(d)(2) Late Applicant 10% Payment Reduction	$0.00
8007(a) Construction - Indian Lands	
8007(a) Construction - Uniformed Services	$0.00
Other(1)	$0.00
Other(2)	$0.00
Other(3)	$0.00
Total Payments Summary	$274,790.49
Prior Payments for this Fiscal Year	$249,017.19
Overpayment	$0.00
Amount Certified for Current Payment this Fiscal Year	$25,773.30
Deductions for Prior Overpayments .	$0.00
Amount of Payment to Applicant	$25,773.30

Figure 105. State LEA Impact Aid Voucher

U.S. DEPARTMENT OF EDUCATION
OFFICE OF ELEMENTARY AND SECONDARY EDUCATION
IMPACT AID PROGRAM
WASHINGTON, D.C. 20202-6244

VOUCHER FOR IMPACT AID SECTION 8003 PAYMENTS
(TITLE VIII of the Elementary and Secondary Education Act)

Voucher Numbers		Fiscal Year	Date
314284 2014-1		2014	04/10/2014
Total ADA	Total Membership	Application Number	
5,008.15	5,388	11-AK-2014-0001	
Local Contribution Rate & Type		Total Current Expenditures	
$8,838.50 1/2 State Average		$967,389,732.00	

Alaska State Department of Education
Attention: Ms. Mindy Lobaugh
P.O. Box 110500
Juneau, AK 99811-0500

Grantee
DUNS Number: 80-938-6824

Payee
DUNS Number: 80-938-6824

PR/Award#: S041B-2014-0131

Pay Type: Initial After Field Review

County: Unorganized Territory

Negotiated Ratio	Attendance Ratio = Prior-Year ADA / Prior-Year Membership	LOT% = TCE% + Membership%
0.92950	= / 5,714	96.30% = 4.21% + 92.09%

SECTION 8003(b) BASIC SUPPORT PAYMENT — LOT Percent Paid: 80.0000%

Category	Membership	ADA	Weight	WSU	Max BSP	Full LOT	Prorated LOT
(A) (i)	0	0.00	1.00	0.00	$0.00	$0.00	$0.00
(A) (ii)	0	0.00	1.00	0.00	$0.00	$0.00	$0.00
(B)	4,962	4,612.18	1.00	4,612.18	$40,764,752.93	$39,256,457.07	$31,405,165.66
(C)	0	0.00	1.25	0.00	$0.00	$0.00	$0.00
(D) (i)	0	0.00	0.20	0.00	$0.00	$0.00	$0.00
(D) (ii)	0	0.00	0.20	0.00	$0.00	$0.00	$0.00
(E)	0	0.00	0.10	0.00	$0.00	$0.00	$0.00
(F)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
(G) (i)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
(G) (ii)	0	0.00	0.05	0.00	$0.00	$0.00	$0.00
8003(b) Total	4,962	4,612.18		4,612.18	$40,764,752.93	$39,256,457.07	$31,405,165.66
(A) (ii)	0	0.00	1.00	0.00			$0.00
(B)	598	555.84	1.00	555.84			$611,424.00
(C)	0	0.00	1.00	0.00			$0.00
(D) (i)	0	0.00	0.50	0.00			$0.00
(D) (ii)	0	0.00	0.50	0.00			$0.00
8003(d) Total	598			555.84	CWD Rate Paid: $1,100.00/WSU		$611,424.00

8003(d) Maximum:	8003(d) Reduction
8003(e) Hold Harmless	$0.00
8003(b)(2) Heavily Impacted Local Educational Agency:	
8005(d)(2) Late Applicant 10% Payment Reduction	$0.00
8007(a) Construction - Indian Lands	
8007(a) Construction - Uniformed Services	$0.00
Other(1)	$0.00
Other(2)	$0.00
Other(3)	$0.00
Total Payments Summary	$32,016,589.66
Prior Payments for this Fiscal Year	$0.00
Overpayment	$0.00
Amount Certified for Current Payment this Fiscal Year	$32,016,589.66
Deductions for Prior Overpayments	$0.00
Amount of Payment to Applicant	$32,016,589.66

Baseline Calculation

Total impact aid losses were calculated by first creating a benchmark year to match the actual federal and state formula as closely as possible. Basic support payment calculations are performed for on-base and off-base students separately, due to the fact that schools on and off JBER are considered different local education agencies (LEA's)[46]. Further, various groups of federally connected students are each LEA are calculated separately due to possessing different weights. Ultimately, calculations for each grouping

[46] JBER is part of a LEA that includes Eielson AFB in Fairbanks along with schools located on military land in Kodiak. Impact aid is calculated as a whole, then broken out to JBER/ASD on a pro rata basis.

in the JBER and the ASD LEA's are summed together and adjusted for state aid withholdings to Anchorage as a whole.

Below is a basic support payment calculation example similar to the voucher in Figure 104. For illustrative purposes, only off-base students, belonging to the active duty military using benchmark numbers are shown.

1. Calculate the **average daily attendance** (**ADA**). This basically gives attendance adjusted for days in school and is equal to multiplying membership by attendance ratio (1985 × 0.92 = **1845**).
2. Calculate the **weighted student units** (**WSU**). This is equal to the ADA from step 1, multiplied by the weight of the connection type (off-base military, subsidized housing etc). In this example, because we are showing off-base military, the weight is 0.2 as opposed to a full weighting of 1 for on-base military children (1845 × 0.2 = **369**).
3. Calculate the **maximum basic support payment (BSP)**. This is equal to the WSU from step 2 multiplied by the local contribution rate (LCR) (369 × $8,838 = **$3.26 Million**).
4. Calculate membership percentage (Membership %). This is the percentage of total federally connected children (not only military) as a percentage of total students in a LEA (2,313 ÷ 48,801 = **4.74%**).
5. Calculate the total **current expenditures percentage (TCE%)**. This is the percentage that the maximum basic support from all categories (not only military) in the LEA represent as a total of the total LEA's budget ($3.26 million ÷ 686,566,000 = **.51%**).
6. Calculate the **learning opportunity threshold percentage (LOT%)**. This is comprised of the membership percentage from step 4 added to the TCE% from step 5 (4.47% + .51% = **5.25%**).
7. Calculate the **full learning opportunity threshold (LOT)**. This is equal to the (BSP) from step 3 multiplied by the LOT percentage from step 6 ($3.26 Million × 5.25% = **$171,228**).
8. Calculate the **prorated LOT**. This is equal to the LOT from step 7 multiplied by the LOT percentage paid (171,228 × 91.73% = **$157,186**)

The calculation above was repeated in a spreadsheet model for off-base military, off-base low rent housing, off-base work on federal property, off-base active military special education, on-base military and on-base military special education. The sum of all student categories for both LEA's totals roughly **$20.9** million using 2014 conditions; with the majority coming from fully weighted, on-base military students subject to a nearly 100% membership percentage within their LEA.

State Withholdings

The state of Alaska is allowed to consider federal impact aid into its state formula after certain non-eligible aid is set aside. This withholding helps pay for basic need in the states foundation formula, otherwise provided by the state general fund. Out of the $20.9 million in federal impact aid calculated for the Anchorage School district, $8.8 million is withheld by the state, leaving roughly $11.3 million for the ASD. The state withholdings formula is described below.

1. **Calculate eligible impact aid**. This is equal to the total impact aid from above less non-eligible aid. Non-eligible aid largely includes funding for children with disabilities ($20.8 million – 667,265 = **$20.2 million**).
2. **Calculate the impacts aid percentage**. This is effectively the percentage that the state is allowed to set aside for foundation formula funding and is equal to local contribution required divided by the total local contributed ($95.4 million ÷ $195.8 million = **48.73%**)

3. **Calculate state withholdings**. Eligible impact aid in step 1 is multiplied by the impact aid percentage to calculate state withholdings, of which the state takes 90% ($20.2 million × 48.73% × 90% = **$8.9 million**)
4. **Calculate Funds to the ASD**. The difference between total impact aid from above and state withholdings ($20.9 million – $8.9 million = **$12 million**)

Impact Aid Reduction Techniques

Once the benchmark model was in place, student counts were cut in various ways to reflect the 4-25th reduction and results of the adjustments compared to the benchmark model. The following steps outline how the ASD student reduction was calculated, along with specificity on reduction scenarios.

1. The study assumes overall dependent population will decrease in proportion to changes in strength levels (see section 2.1.2.3). Table 39 shows a reduction of 2,630 from the 4-25th's full TOE (3590) represents roughly 73 percent of the brigade. Accordingly, students attending school in the ASD are likely to reduce by 73 percent (73% × 1,235 = 905), leaving 330 students associated with the 4-25th, or a reduction of 905 students.

Table 39. ASD and MSBSD Students Associated with the 4-25th

	Current Conditions		With Reduction Options	
School District	3,590 TOE	3,351 ASL	Validated ATF	Reduce by 2,630
4-25th Students Attending School in the MOA	1,235	1,152	549	330
4-25th Students Attending School in the MSB	435	406	193	116
All School Attendees Associated with the 4-25th	1,670	1,558	743	447

Note: Developed by Northern Economics based on data from ASD (2016) and USARAK (2016).

2. The 905 students were reduced in 3 different scenarios to reflect possible outcomes and compared to the baseline.
    a. Military connected students, reduced as a result of the drawdown, reside in on-base and off-base housing in equal proportions. Vacancies in on-base housing, as a result of the drawdown, remain vacant. This is equal to running the baseline model, but with 452.5 fewer military students in the on-base voucher calculation and 452.5 fewer military students in the off-base voucher calculation. The results of this scenario report $9.3 million to the ASD or $2.7million less than the baseline.
    b. Due to a full waiting list for on-base housing (Aurora Military Housing, 2016), vacancies attributed to the reduction are quickly filled by military families, and cause only off-base military student counts to drop. This is equal to running the baseline model, but with 905 fewer military students in the off-base voucher calculation. The results of this scenario report $11.3 million to the ASD or $729 thousand less than the baseline.
    c. Military connected students, reduced as a result of the drawdown, reside in on-base and off-base housing in equal proportions. However, to fill on-base vacancies, civilians are allowed to live in privatized housing, half of which work on base, half work off. This is equal to 452.5 fewer military students in the on-base voucher calculation, 452.5 fewer military students in the off-base voucher; and an addition of 226.25 on-base students whose parents work on federal property, and an addition of 226.25 on-base students whose parents do not work on federal property. The results of this scenario report $10.8 million to the ASD or $1.2 million less than the baseline.

Appendix D: Utility Impact Calculations

This appendix documents the data and methods used to estimate the impacts of a 4-25th troop reduction on natural gas demand on JBER Fort Richardson.

Data

Three different sets of data were used, historical natural gas usage on JBER Fort Richardson, heating degree days in anchorage and a deployment schedule of Army units stationed at JBER Ft. Richardson. Their sources and details are provided below.

Historical Natural Gas Usage

Historical natural Gas Usage was provided directly from ENSTAR (2016) Natural Gas from small commercial and large commercial (C3 and C4) meter data. Total 2015 consumption was roughly .67 Bcf with pronounced usage November through March and very little June through August.

Heating Degree Days

Temperature used in this analysis was retrieved from the National Oceanic and Atmospheric Administration (NOAA, 2016) and reported as the monthly sum of daily HTDD at the Anchorage Merrill Field weather station.

Temperature is well known to be the primary driver of natural gas consumption. However, heating degree days, or HTDD, provide an even more precise estimator of energy demand. In general, heating degree days indicate how far a day's average is below 65 degrees Fahrenheit, the temperature assumed to require no heating energy. Any day averaging below 65 degrees is equal to the difference between 65 and the average temperature for that day.

Deployment Schedule

Deployments, for the purpose of this analysis, includes all army deployments. A deployment schedule was developed through multiple sources including newspaper articles (Doogan, 2014; Mauer, 2011), information posted on military sites (Gross, 2011), as well as communications with USARAK (2016).

Table 40. JBER Fort Richardson Deployment Schedule

Time Period	Status	Unit
Jul 05 - Sept 06	Rest and Refit	
Oct 06 - Dec 07	Deployed	4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division
Jan 08 - Jan 09	Rest and Refit	
Feb 09 - Mar 10	Deployed	4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division
April 10 - Nov 11	Rest and Refit	
Nov 11 - Oct 12	Deployed	4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division
Oct 12 - June 13	Rest and Refit	
July 13 - Mar 14	Deployed	110th Transportation Company / 95th Chemical Company
April 14 - Aug 14	Deployed	2nd Engineer Brigade
Sept 14 - Dec 14	Deployed	2nd Engineer Brigade / 1st Squadron (Airborne), 40th Cavalry
Jan 15 - Feb 15	Deployed	1st Squadron (Airborne), 40th Cavalry
Mar 15 - Nov 15	Deployed	716th Explosive Ordnance Disposal
Dec 15	Rest and Refit	

Source: Northern Economics using data from newspaper articles (Doogan, 2014; Mauer, 2011), Military websites (Gross, 2011), as well as communications with USARAK (2016).

Natural Gas Revenue to ENSTAR

Charges associated with gas sales to JBER Fort Richardson are provided by ENSTAR (2016). In 2015 charges to JBER Fort Richardson were roughly $5.8 million.

Methods and Results

This analysis is primarily concerned with measuring the impacts of a force reduction on natural gas demand, holding all other factors constant.

To our knowledge, JBER Richardson does not have any instances of its forces being permanently reduced in the same fashion as described in section 2.1.2.1, and as such, the study team could not directly estimate a resulting loss in gas demand. Instead of an actual reduction, this analysis used periods of Army deployment as a proxy for the permanent reduction of the 4-25th. While a deployment serves as some measure of a reduced force, it is important to note that a permanent reduction may exhibit different results.

An ordinary least squares (OLS) econometric model was used to estimate the percentage change in gas usage Y, given a historical deployment X, multiplied by its estimated coefficient β_1, for customer class i at time t.

$$lnY_{it} = \beta_1 X_t + \beta_2 W_t + u_{it}$$

lnY_{it} is the log of gas usage in CCF used in month t by customer class i, X_t represents a set of dummy variables indicating whether not a deployment was occurring during month t. W_t is a temperature covariate, measured in heating degree days accumulated during month t. u_{it} represents unobserved errors.

It was thought that residential and commercial customers (based on meter type) would respond differently to a deployment in terms of natural gas demand. To capture disparate effects between the two classes, regressions were ran separately and their results presented below in Table 41, along with standard errors in parenthesis.

Table 41. Estimated Effects of Deployment on Gas Demand at JBER Ft. Rich

Dependent Variable = ln (gas usage)	C3 Customers	C4 Customers
Deployment	-0.16*	-0.08*
	(0.08)	(0.05)
Heating Degree Days	0.001***	0.001***
	(0.00008)	(0.00004)
Intercept	6.627***	12.3***
	(0.09)	(0.06)
Observations	84	84
Adjusted R2	0.73	0.88

Note: *p<0.1, **p<0.05, ***p<0.01

Results[47] in Table 41 show that the partial effects of deployment on JBER Fort Richardson natural gas demand take on expected, negative, and significant results. During a deployment, demand for natural gas of C3 customers is estimated to reduce by some 16% while C4 customers are estimated to reduce consumption by 8%. The coefficient on heating degree days per month is highly significant and also expected. It is estimated that for every HTDD, natural gas usage increases by 0.1% and explains the majority of variation in gas demand.

Multiplying the partial effects of deployment on gas demand with annual gas charges in 2015, we estimate an average annual loss of $926,000 (16% × $5.8 million = $926,000) for C3 customers and $464,000 (8% × $5.8 million = $464,000) for C4 customers.

[47] Regression coefficients are estimated using the statistical software R.