Alaska Housing Finance Corporation
2009 Alaska Housing Assessment

DECEMBER 2009 | PART I

Prepared for

COLD CLIMATE HOUSING RESEARCH CENTER
& ALASKA HOUSING FINANCE CORPORATION

Information Insights
Fairbanks + Anchorage

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2009 Alaska Housing Assessment

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We express grateful appreciation to all the Alaskans who agreed to complete the statewide housing survey.

Prepared for

Cold Climate Housing Research Center
1000 Fairbanks Street
P.O. Box 82489
Fairbanks, AK 99708

Alaska Housing Finance Corporation
P.O. Box 101020
Anchorage, AK 99510

Prepared by

Information Insights, Inc.

Project Lead: Cady Lister
Research Analyst: Indra Arriaga
Survey Lead: Sylvan Robb
Publication Design & Editing: Jana Peirce
Data Cleaning & Entry: Nancy Lowe

Corporate Office
212 Front Street, Suite 100
Fairbanks, Alaska 99701

Anchorage Office
429 L Street
Anchorage, Alaska 99501

www.infoinsights.com
info@infoinsights.com

information insights

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Executive Summary

A NOTE FROM THE AUTHORS ON LIMITATIONS

The purpose of the 2009 Housing Assessment is to paint a picture of the condition and energy use of the current housing stock in Alaska. The study focus is on the condition of the housing unit and energy consumption and pays only cursory attention to the inhabitants of those units. One important exception is an estimate of conditions of overcrowding, a long standing issue in Alaska housing.

Our estimates of need for new housing units are based solely on alleviating overcrowded conditions and replacing severely substandard housing. The project team recognizes that there are many variables, social, economic, climatic, that play a role in an individual and/or a family's ability to access and maintain safe and affordable housing. It was not within the scope of this report to consider all of these variables.

The estimates of need are not comprehensive and should not be interpreted as such. They do, however provide some valuable direction in solving issue of overcrowding, severely substandard housing and providing estimates of homes that could benefit from weatherization services.

This 2009 Alaska Housing Assessment provides an overview of housing stock in Alaska. The purpose of the study is to assist in determining the condition of that stock so that policy makers and builders can make informed decisions about where the need is greatest. This study follows two similar studies, one in 1990 and another in 2005.

The primary difference between this study and the one conducted in 2005 is the shift in focus from the resident of the housing unit to the housing unit itself. The winter of 2008/2009 taught all of Alaska just how vulnerable we are to heating fuel price fluctuations that are beyond our control. High fuel prices sparked a renewed interest in reducing energy used for space heating, thus lowering bills and creating environmental benefit.

The information presented in this study derives from a variety of sources. Major sources include but are by no means limited to the list below:

- 2000 U.S. Census
- 1990 U.S. Census
- 1980 U.S. Census
- Weatherization data provided by Alaska Housing Finance Corporation (AHFC)
- Alaska Home Energy Rebate program data provided by AHFC
- Data from 11 of the Alaska Native Regional Housing Authorities (RHA)
- Telephone survey of nearly 1,700 households statewide, conducted by Information Insights
- Department of Labor and Workforce Development Research Section
- Alaska Housing Market Indicator Reports, 2000 through 2007, published quarterly
- Native American Housing and Self Determination Act Recipient Data provided by the Department of Housing and Urban Development Office of Native American Programs and Alaska Native Regional Housing Authorities

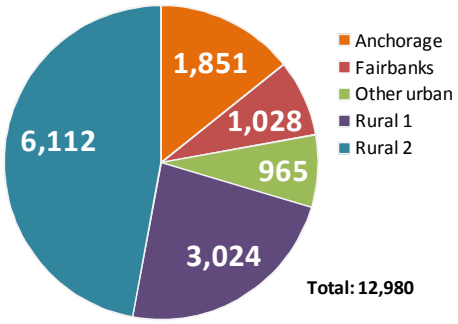
Key Findings

Major findings of the study include an estimate of the need for new housing in the state based on current overcrowding and the condition of existing housing units. Data gathered from nearly 1,700 households statewide on residential heating fuel use and energy costs also provided the basis for estimating energy consumption for home heating for different types of community and regions of the state.

TOTAL NEED FOR NEW UNITS

The 2009 Housing Assessment estimates a need for 12,980 new housing units to meet demand created by overcrowded conditions and houses that are severely substandard. Almost half (47.1 percent) of new housing is needed in smaller and more remote rural communities (designated as Rural 2 in this study). Almost another quarter (23.3 percent) are in other rural communities, including larger communities off the road system as well as small communities on the road system (designated as Rural 1). The remaining housing units are needed in Anchorage (14.3 percent), Fairbanks (7.9 percent) and other Urban areas (7.4 percent).

Figure 1: Need for new housing by community level



OVERCROWDING

Calling a household overcrowded is somewhat subjective; we provide high, medium and low estimates in the bulleted lists below. Estimates of overcrowded conditions are defined as high (150 square feet per resident), medium (200 square feet per resident) and low (300 square feet per resident). Final estimates of need are based on the medium definition of overcrowding.

The 2009 estimates of overcrowding are roughly half that found in the 2005 housing assessment. The significant decrease is attributable to a more sophisticated methodology used in this study. The 1991 and 2005 housing assessment studies estimated of overcrowding by applying a single percentage to the state or Native region housing stock number to arrive at an estimate of overcrowded units. The total number of housing units estimated to be overcrowded in these two studies hovered around 20,000 units. If we apply this same methodology to the 2009 housing assessment we arrive at a number just under 20,000 units (18,428 to be exact).

However, the project team believes this number to be inflated by oversampling in rural areas and then applying the resulting percentage (of overcrowded units) to the state as a whole or to Alaska Native region housing stock even though the majority of housing units are located in urban communities - where overcrowding is far less common. The 2009 estimates of overcrowded housing units in primarily rural areas did not see as significant a change from 2005 estimates as the change we see in areas that include urban communities.

In estimating overcrowding for the 2009 housing assessment, we looked at the percentage of overcrowded units by community level (Urban, Rural 1, Rural 2, etc.) and applied those percentages to the estimated housing stock based on the proportion in each community level within a region. It is a subtle change in methodology that created a significant change in output. We believe that the number of overcrowded units derived from the new methodology (9,946) is more accurate, and it has been used as the basis to determine housing need based on overcrowding in this report.

High overcrowding (Less than 150 square feet per person = overcrowded)

- 1.6 percent of households in Alaska have fewer than 150 square feet per resident
- There are roughly 4,500 homes in Alaska with fewer than 150 square feet per resident and 74.9 percent of them are located in Rural 2 communities. These are the smallest and most isolated villages in Alaska.
- The remainder of these homes are relatively evenly split between Rural 1 and Urban communities.

Medium overcrowding (Less than 200 square feet per person = overcrowded)

- 3.5 percent of households in Alaska have fewer than 200 square feet per resident.
- There are nearly 10,000 households statewide with fewer than 200 square feet per resident and 48.9 percent of them are located in Rural 2 communities.
- More than 20 percent – or one out of five - of all homes in Rural 2 communities report overcrowded conditions, representing nearly half of all homes in the state with fewer than 200 square feet per resident.
- The remainder of overcrowded homes are relatively evenly split between Rural 1 and Urban communities; about a quarter of the remaining overcrowded homes in Urban and a quarter in Rural 1 communities.

Low overcrowding (Less than 300 square feet per resident = overcrowded)

- 10.5 percent of households in Alaska statewide have fewer than 300 square feet per resident; this represents nearly 30,000 housing units.
- A little less than half – 14,188 units - of these homes are in Urban Alaska. The remainder of overcrowded homes by this definition are split between Rural 1 – 7,135 units - and Rural 2 – 8,402 units - communities with 24 percent and 28 percent respectively.

What is clear from these findings (and is consistent with earlier housing assessments) is that very remote, small communities that are not on the highway system (either road or marine) have much higher levels of overcrowding than larger, connected and urban communities. It is worth noting that while there is the least amount (in terms of a percentage of total) of overcrowding in Urban areas, Rural 1 communities report only a slightly higher proportion of overcrowding overall.

An estimated 9.4 percent of overcrowded housing units are ALSO falling apart; duplicates are removed from estimate of total need for new housing units.

UNSALVAGEABLE CONDITION

The other primary driver used in estimating housing need is the determination that a housing unit is so substandard that it is unsalvageable. Survey results on condition of home indicate that 1.4 percent, or just under 4,000 housing units are unsalvageable statewide. This is a little more than 500 units lower than the 2005 survey results that estimated need due to condition at 4,500 units statewide.

This apparent drop is directly attributable to the new focus on the housing unit and away from the resident living within. The 2005 survey included questions about whether the home had repairs that the owner was unable to make. If this was the case the home was determined to be substandard and in need of replacement. In truth, much of the time when a home has repairs that the homeowner is unable to make, the unit is unsalvageable for economic reasons not reasons associated with the condition of the home.

- 1.4 percent (or 3,972) of homes statewide are estimated to be "falling apart"
- Sixty-three percent of homes that are "falling apart" are in rural Alaska, most of them in the most remote Rural 2 communities.

HOUSING SIZE AND AGE

- **Very small houses**: Rural 2 communities have a high proportion of small houses – 12.5 percent of homes are less than 500 square feet. Less than one percent of the housing stock in Anchorage falls into this size category.
- **Small houses:** The largest proportion of houses that are 501 to 1,000 sq ft are located in Rural 2 communities where nearly 37 percent of all units fall into this range. All other types of communities have housing stock that is comprised of between 12 and 17 percent of housing units in this size range.
- **Medium houses**: Roughly half of all housing units in Anchorage, Fairbanks, other Urban and Rural 1 communities are between 1,001 and 2,000 square feet. Just under 40 percent of housing units in Rural 2 communities are also this size.
- **Large houses**: The largest proportion of large (greater than 2,000 sq ft) houses in the state are in Anchorage (40.9 percent) followed by other Urban communities (37.4 percent) and Fairbanks (33.6 percent.) Only 10.8 percent of homes in Rural 2 communities are larger than 2,000 square feet.

Survey respondents reported a good proportion of new homes (zero to ten years) in all communities with the exception of Anchorage. The real numbers of new housing units is largest in Anchorage but as a percentage of total housing stock these units represent only about eight percent. Anchorage has the largest proportion of housing that is 21 years and older, with 80 percent of housing stock within the municipality of Anchorage falling into this category.

HOUSING CONDITIONS

Most housing units in Alaska are in relatively good shape. Survey respondents reported their homes to be like new, in good shape, or in need of minor repair the majority of the time, even in Rural 2 communities.

- The largest proportion of housing units determined to be "falling apart" are in Rural 2 communities (7.2 percent of all housing within the Rural 2 classification.)
- Falling apart housing units in Rural 2 communities represent 43 percent of all units estimated to be falling apart statewide – a disproportionately high number compared to the proportion of total housing stock located in these communities.
- An additional 25 percent of homes in Rural 2 communities are in need of major repair (5,976 actual units.)
- There are an estimated 23,475 housing units in need of major repair in statewide

- All of the Urban communities and the Rural 1 communities reported at least 89.6 percent of their housing stock was like new, in good shape or in need of minor repair. Rural 1 communities had a slightly higher rate (9.1 percent) of housing in need of major repair than Urban communities.

FINDINGS BY NATIVE REGION

Statistically significant findings are used to estimate need for Calista, Cook Inlet, Doyon and Sealaska regions. These regions encompass nearly 90 percent of total housing stock statewide. Estimates based on statistically significant findings by level of community are used to estimate need in the remaining Alaska Native regions.

The Native region with the greatest level of need is the Calista region in western Alaska. This region includes some of the poorest communities in Alaska and has long stood out an area in need of, amongst other things, adequate housing.

- 31 percent of housing units in Calista region are overcrowded (200 square feet or fewer per person)
- Nine percent of housing units in Calista region are perceived by their inhabitants to be falling apart.
- The greatest need by sheer numbers exists in the Cook Inlet region where there is need for an estimated 4,161 new units.

ENERGY USE

Energy consumption for space heating accounts for about 45 percent[1] of all energy used to run a home in Alaska. How much energy is consumed depends on several factors: climate, condition and size of the home and the behavior of the homeowner. The table below shows the heating degree days for four Alaska locations and two lower 48 locations for comparative purposes. The numbers displayed are not surprising, Barrow has more than twice as many heating degree days as Juneau and all Alaska locations are higher than the lower 48 locations.

Table 1: Heating degree days by location

Location	Heating degree days
Barrow	20,226
Fairbanks	13,940
Anchorage	10,570
Juneau	8,897
New England	6,752
Seattle	4,908

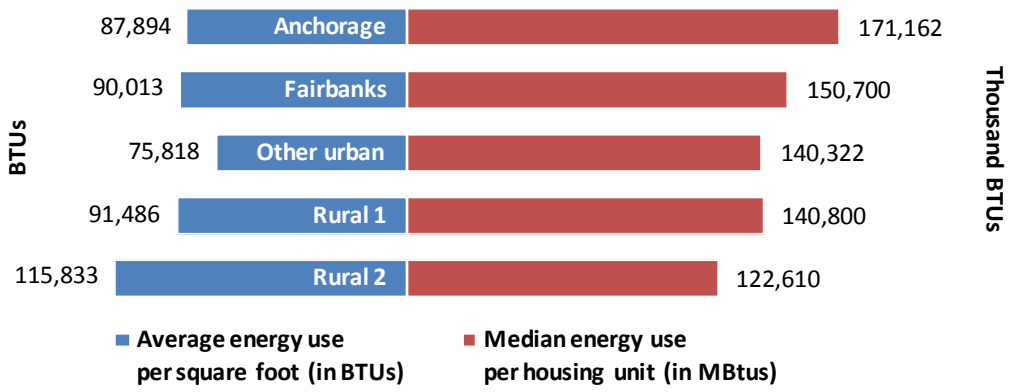
The statewide survey conducted as part of this project asked residents to talk about their energy consumption for space heat, including both primary and secondary fuel sources where applicable. Survey respondents had varying levels of knowledge

[1] This figure is derived from analysis of the Alaska Retrofit Information System

about their household energy consumption, but respondents who were unable to provide energy consumption in units of fuel were most often able to report dollars spent. This information was then translated into British thermal units (BTUs) for purposes of comparison.

Residents of communities in rural Alaska consume the highest average number of BTUs per square foot (BTU/ft^2) for space heating. The "Other urban" community classification has the lowest. Keep in mind that most housing units in this classification are in Southeast and Southcentral Alaska where the climate is more temperate. The amount of energy used for space heating for each community type is shown in Figure 2. Looking only at BTUs per square foot (the blue bars), it would appear that households in Alaska's smallest and most remote communities are the largest energy consumers.

Figure 2: Energy use for space heating by community level



Notes: Most of the housing units in "Other urban" communities are in Southeast and Southcentral Alaska, where the climate is more temperate. Energy use per square foot is given in BTUs. Energy use per housing unit is provided in thousand BTUs.

However, the picture changes when we look at energy consumption per housing unit (the red bars). The average Anchorage household uses more energy for space heating than any other part of the state, while units in Rural 2 communities use the least. These seemingly incongruent figures are explained entirely by the fact that, on average, homes are largest in Anchorage and smallest in Rural 2 communities. The median size of a home in Anchorage is more than 900 square feet larger than the median-size home in a Rural 2 community; 900 square feet is a significant amount of additional space to heat.

Not surprisingly Alaska homes utilize more energy for space heat than their lower-48 counterparts. The average home in New England uses only 85.4 MBtu (million BTUs) for space heating, compared to 150.7 MBtu in Fairbanks.

The median cost of fuel reported by survey respondents is in keeping with these findings and with what we know about the cost of different heating fuels. The typical natural gas user has bills that are slightly less than half the annual cost of the

average heating oil user. Electricity, coal and wood are also more cost effective than heating oil, but more costly than natural gas.

It is worth noting that the most expensive heating fuel to use is also the most geographically widespread in Alaska. Heating oil is available in all parts of the state and is used as the primary heat source in the majority of rural communities as well as in Fairbanks and Southeast Alaska. Natural gas is widely available to a large portion of the state population since it is the common space heating fuel for Anchorage, the Mat-Su core area, and the Kenai Peninsula Borough.

WEATHERIZATION

There are more than 27,700[2] housing units estimated statewide to be in need of weatherization services because residents are unable to maintain a comfortable indoor temperature during the coldest parts of winter. The ability to maintain temperature is a function of both housing condition and socioeconomic status of its inhabitants. Study findings related to weatherization include:

- One in five homes in Rural 2 communities report being unable to maintain a comfortable room temperature during winter.
- An estimated 7.1 percent, or nearly 8,000 homes, in Anchorage are unable to maintain room temperature during winter.
- More than 115, 000 housing units statewide are believed to be "drafty" (defined here as wind coming through the windows, door or floor).

ALASKA HOME ENERGY REBATE

It is difficult to provide an estimate of the number of housing units that could benefit from the home energy rebate program because it is likely that nearly every house in Alaska could see some benefit from participating in the program. We can say with some confidence that at least the estimated 115,000 homes that are believed to be drafty would see substantial benefit from participation in the program.

The project team analyzed the records of 368 housing units that have completed the program – that is: they have had their initial (as-is) rating, they have done the improvements suggested by their energy rater, and they have had their post improvement rating to measure the how much more efficiently their home is using energy. Findings from this analysis of homes completing the rebate program include:

- The average home moved from a 2.7 star home to a 3.8 star home.
- The average reduction in energy costs is 30 percent.
- Homes saw an average reduction of 45 percent in the energy used to run their space-heating appliances (e.g. furnace, stove, etc.)

[2] Not all of these housing units are occupied by residents who qualify for the weatherization program. The number of homes estimated to be both in need of services *and* financially eligible for the program is presented in the weatherization section within the body of the report.

Introduction

The purpose of the 2009 Housing Assessment is to provide a snapshot of housing stock, condition and energy use in Alaska. This 2009 Alaska Housing Assessment updates the 2005 assessment with some important differences. The 2005 study focused on the inhabitants of the housing units whereas this study aims to focus more attention on the unit itself. For this reason there were more questions on the survey related to energy consumption, taking the place of questions about resident satisfaction with housing, rental/owner status, etc.

Data Sources

The project team gathered information on housing variables including condition, energy consumption, and limited demographics of residents through a survey of nearly 1,700 households. The study uses updated housing unit data from the 2000 U.S. census[3], the Alaska Housing Market Indicators report, and information provided by regional housing authorities to create a baseline estimate of housing stock.

Information on housing construction in rural Alaska has been derived primarily from data provided by Alaska Native Regional Housing Authorities that are recipients of Native American Housing Assistance and Self Determination Act (NAHASDA) funds. Congress passed NAHASDA in 1996, empowering Tribes by giving them direct access to money intended to improve housing for Alaska Native/American Indian people. Since that time recipients of NAHASDA funds have built the majority of new housing in rural Alaska.

New unit construction reported for rural areas by regional housing authorities was compared to information on new housing units gathered by the State of Alaska. Where there was disparity it was generally the case that the state had no record of anything being built and the housing authority had record of building units. In these cases the housing authority numbers were used.

Report Organization

This report is organized in two parts. Part I of the report contains:

[3] Note that the 2000 census housing stock numbers have been updated by community through the appeal process. Many communities in Alaska (particularly in rural areas) successfully appeal the findings of the census. The most recent numbers available are the ones used in this report, this means that our regional numbers do not always exactly match the regional numbers published in the 2000 census.

- An executive summary of results
- A detailed description of the methodology utilized to perform household surveys and assess need
- Highlights of salient findings and a general overview in narrative form
- Population dynamics
- Cost of construction around the state
- Details of income by population and housing variables
- Analysis of weatherization activity
- Analysis of Alaska Home Energy Rebate program activity
- Estimates of housing stock and condition detailed by community classification and Alaska Native region

Part II of the report includes three appendices:

- Explanation of levels of community used in public health and a list by community of the classifications used in this study
- Completed survey counts
- Frequency tables from the survey

Definitions

Estimating housing need is based on survey findings that indicate conditions of overcrowding and severely substandard housing.

- **Overcrowding** is defined as a household with 200 square feet or fewer per resident.
- **Substandard housing** is broken into two categories, that which is salvageable and that which is not. The units that are determined to be beyond repair prompt a new housing unit. Substandard housing units that are determined to be salvageable prompt need for repair and renovation.
- **Weatherization –** An estimate of need for weatherization services is provided and is based on survey respondents indicating that they were unable to maintain a comfortable room temperature during the coldest days of winter.

Estimates of housing stock and housing need are broken out by community type. Alaska communities were first divided into three classifications by remoteness and size: Urban, Rural 1, and Rural 2. The Urban community type was further broken down into Anchorage, Fairbanks, and Other. These five community types or levels are described below:

- **Anchorage** includes the Municipality of Anchorage
- **Fairbanks** includes the Fairbanks North Star Borough
- **Other urban** includes highway-connected large towns, small cities and urban centers
- **Rural 1** includes highway-connected villages and off-road regional hubs
- **Rural 2** includes the smallest and most isolated communities in Alaska, all of which are off the road system

These community classifications stratify the state according to the variables that most impact access to quality housing: transportation, access to skilled labor, a viable housing market, and economic activity. Anchorage and Fairbanks are broken out of the Urban category because they represent such a large percentage of the state population and thus skew findings for other urban areas. A detailed description of the methodology behind the community classifications can be found in the methodology section and a complete listing of communities and their classifications is included in the appendices.

Estimates of housing stock and need are also outlined for each of the Alaska Native regions. Statistically significant survey data was collected for the largest regions and was used to estimate need. For the smaller regions, findings from the appropriate community classification were applied to the regional housing stock (i.e. if a regions' housing stock is 58 percent in Rural 1 communities and 42 percent in Rural 2 communities then findings relevant to those community classifications are applied to the appropriate housing stock numbers in the region.)

We do not try to estimate the gross cost associated with new units, or repair and renovation. Past studies have used Anchorage as a baseline for determining costs and made adjustments to cost by region depending on how much more or less transportation costs are in relation to Anchorage. This method is problematic at best, even within regions there is vast variability in costs mostly associated with transportation and access to skilled labor. The report does include a section on construction and transportation costs which outline costs in select locations around the state.

Methodology

The 2009 Alaska Housing Assessment provides a synthesis of existing housing data and new data resulting from a statewide telephone survey. The final report describes the housing situation in Alaska in a variety of ways, striving to be accessible and understandable. It represents the culmination of a range of tasks performed by the project team:

- Gathering, organizing and analyzing existing data and other useful information.
- Analysis of information provided by Alaska Native Housing Authorities.
- Redesigning the household survey tool to glean more information on the housing unit.
- Conducting nearly 1,700 household surveys in rural and urban Alaska.
- Analyzing the survey data.
- Analyzing AHFC Weatherization and AK Rebate data.
- Producing estimates of current housing stock.
- Producing estimates of housing stock condition.
- Producing estimates of need.

Sample Selection and Community Classification

The telephone survey included selected communities around that state. First, all communities were designated as Urban, Rural 1 or Rural 2. To achieve this classification we started with the five levels of community designations used by Alaska public health that were then collapsed into three community types. Given that this survey was focused on housing issues and much of the cost of housing is related to the difficulty and expense of transporting building materials to the communities, the primary variables driving classification are population and accessibility. A table explaining the public health levels of community is included in the appendices, along with tables listing each Alaska community and its associated classification.

Urban communities include Level 3 communities on the road system and all Level 4 and 5 communities in the public health categories. All Urban communities must be on the highway system (either road or marine), including:

- Highway sub-regional communities
- Large town or regional centers
- Small cities

- Urban centers

Rural 1 communities include Level 1 and Level 2 communities on the highway and Level 3 communities off the highway of the public health categories. These communities may be on or off the highway system. This includes:

- Highway villages
- Off-road regional hubs
- Isolated sub-regional communities

Rural 2 communities include Level 1 and 2 communities off the highway from the public health categories. No communities on the road system could be Rural 2 for our purposes. Rural 2 includes:

- Isolated villages

Because we wanted to be able to analyze the data for the Anchorage and Fairbanks urban areas, all communities in the Municipality of Anchorage (Eagle River and Girdwood) and all those in the Fairbanks North Star Borough (Chatanika, Ester, Fox, and Salcha) were categorized as Urban. Additionally, the status of communities that are on the road system for a portion of the year were determined on an individual basis. Communities that are accessible only by ice roads in the winter such as Evansville or Bettles were not considered to be road-system communities. However Eagle, which has road access in the summer, was treated as an on-road community.

The goal of the sample was to provide a statistically representative sample for each of the community levels (Urban, Rural 1 and Rural 2) as well as surveying enough households in the Municipality of Anchorage and the Fairbanks North Star Borough to ensure those areas had a representative sample. We used the 12 Native Corporation regions to ensure that within each community level we had as much statewide representation as possible.

The methodology described below was applied to each community level for the survey sample (e.g. Urban, Rural 1 and Rural 2). The first step was to sort all communities in the state into the Urban, Rural 1 and Rural 2 categories. The communities in each of those categories were then sorted by Native Corporation region. The total population for each community level (Urban, Rural 1 and Rural 2) was calculated. We then calculated the percentage of the population in each community level in each Native corporation region (e.g. the total population of Rural 1 communities statewide was 140,591 and communities in the Doyon region accounted for 7 percent of that population). Thus since we needed 383 completed surveys from Rural 1, we wanted 7 percent of those, or 26 surveys, to be from Doyon Rural 1 communities.

Within each Native corporation region the communities were ordered according to population. Then six communities were selected from the list; the number six was based on nothing but what felt like a reasonable compromise between representation and convenience. Obviously, for those Native Corporation regions

with six or fewer communities at that level, all communities were selected. For those Native corporation regions with more than six communities, every n^{th} community was selected to reach six. (We tried to keep the selections even--for example, in those regions with 8 communities to chose from we selected the first and second communities on the list, skipped the third, selected the fourth and fifth, skipped the sixth, and selected the seventh and eighth).

In order to decide how many numbers to pull from each community selected, we tallied the population for the six selected communities. We then calculated the percentage of the selected communities' total population represented by each selected community. (E.g. Fort Yukon's population equals 60 percent of the total population from the six selected Doyon communities.) We then calculated the number of needed phone numbers that represented (e.g. if Doyon needed 1,000 phone numbers total, I figured out that we needed 600 numbers from Fort Yukon.) We agreed that for any selected community for which we could not obtain a telephone book, we would just drop to the next community on the list and take the same number of phone numbers from that community instead. We did not select any communities with a population of zero.

Statewide Survey Methodology

Telephone calls were made to call lists of randomly selected residents in the selected communities. Telephone numbers for the urban areas of Anchorage, Fairbanks and Juneau were obtained from the Polk Directory for the area that is updated every three months. Telephone numbers for other areas were selected from the some recent edition of the telephone book for each area. Calls took place from October 6th to November 3rd from 6:30 to 9:00 p.m. Approximately 7,365 calls were made resulting in 1,698 completed surveys. A total of 16 of our trained survey callers made calls.

DEVELOPMENT OF SURVEY QUESTIONS

The survey tool was designed to obtain information on:

- The demographics of household members
- Household size and conditions
- Costs associated with maintaining space heat in the household

Information Insights developed the survey tool with input from the Cold Climate Housing Research Center and the Alaska Housing Finance Corporation.

SURVEY IMPLEMENTATION AND LIMITATIONS

Number of Calls Made: Approximately 7,365 calls were made over the four-week period. Of these, there were 1,136 (15 percent) invalid numbers or numbers without an eligible participant, 2,573 (34 percent) numbers where no one answered, 1,881 (25 percent) individuals who answered but chose not to participate in the survey, 332 (4 percent) people who asked to be called back at a

different time but didn't complete the survey, and 1,698 (22 percent) completed surveys.

- Number completed: **1,698**
- Response rate: **22 percent**

The Alaska Department of Commerce, Community, and Economic Development (DCCED) 2007 certified populations were used for all communities. While landline phones are typically allocated by household not by person, the sample was developed based on population. DCCED does not provide numbers of households; the U.S. Census Bureau does not provide estimates of households only the actual count conducted every decade. Thus we used population figures since they were the most current even though that might have led to slightly over sampling. Per DCCED the population for the state is 629,163. The population in Urban communities was 438,227. We gathered 384 completed surveys. The population in the Rural 1 communities was 140,591. We gathered 383 completed surveys. The population in the Rural 2 communities was 50,345. We gathered 381 completed surveys. The population of the Municipality of Anchorage was 283,938. We gathered 384 completed surveys. The population of the Fairbanks North Star Borough was 96,888. We gathered 383 completed surveys. The sample sizes for each of these areas provides a confidence interval of plus or minus 5.0 with a confidence level of 95 percent.

The survey information is limited to application in estimating overall housing condition by the classifications of Rural 1, Rural 2, Urban, Anchorage and Fairbanks North Star Borough. This method of classifying communities in the state makes sense for housing as the variables considered are that that impact cost of construction and access to skilled labor. There is also a strong correlation across the state between communities within each classification in terms of other economic indicators such as income and education.

ANALYSIS OF SURVEY DATA

Information Insights staff provided analysis of survey data in narrative, picture and spreadsheet formats.

Analysis of Energy Rating and Alaska Rebate data

Information Insights staff uploaded 1997 and 1998 energy rating data into the new AHFC database, the Alaska Retrofit Information System; 2007 and 2008 data were already in the system. The 1997 and 1998 data record count was reflected in the total number of ratings in the system; however, needed programming changes in order to integrate decade-old data into the database were not completed in time for this report, rendering the 1997 and 1998 records "null" and therefore unusable for this analysis.

AHFC is in the process of integrating all energy rating data into the new database, at which time it will be possible to perform analysis on the entire dataset. The project

team highly recommends performing this analysis as it will include tens of thousands of records and allow policy makers and planners to dissect the data in multiple ways and refine their understanding of the variables that effect household energy consumption in Alaska.

The initial data for the four years was first cleansed of "true" duplicates, that is, duplicate records that matched on every variable. The remaining data was then separated by year and summaries were compiled, 1997 and 1998 data were excluded from the summary analysis as the variable fields were null.

2007 and 2008 data were parsed out by the respective year. Records that showed all data as 'null' were excluded from analysis. Records that were partially 'null' were left in the dataset but only included where relevant. The decades were further analyzed for duplicates. While the first duplicate check matched data on all fields, the second duplicate check matched on First Name, Last Name, Address, Home City, Rating Type and Rating date. The data was then manually checked for duplicates a third time looking at address, first name and last name. Where the address field contained "na" or "wrong address" and there were no other indications that could differentiate reliably between these, these data were also excluded for analysis. Where the same record existed more than once and differed by rating date, the later date was kept and the earlier dates excluded.

Housing units were grouped by decade range in which they were built and then totaled. Average square footage was then derived by decade. In some cases, the "year built" was in the future of the rating date, given the illogical data, these were excluded from analysis.

Regional Native Corporation boundary information was added to each of the records in the 2007 and 2008 dataset and the data presented by these regions. In this particular dataset, there are no records matching the Arctic Slope region. That is not to say that there were no ratings in the region for 2007 and 2008, but rather that in a dataset that excludes incomplete, illogical or null data, no records for the Arctic Slope made it through the process. Another limitation of the dataset is that the frequency of ratings is not equally distributed across the state, making data analysis of the rural areas less reliable; in cases where only a couple of records by fuel type exist, making comparisons is inadvisable.

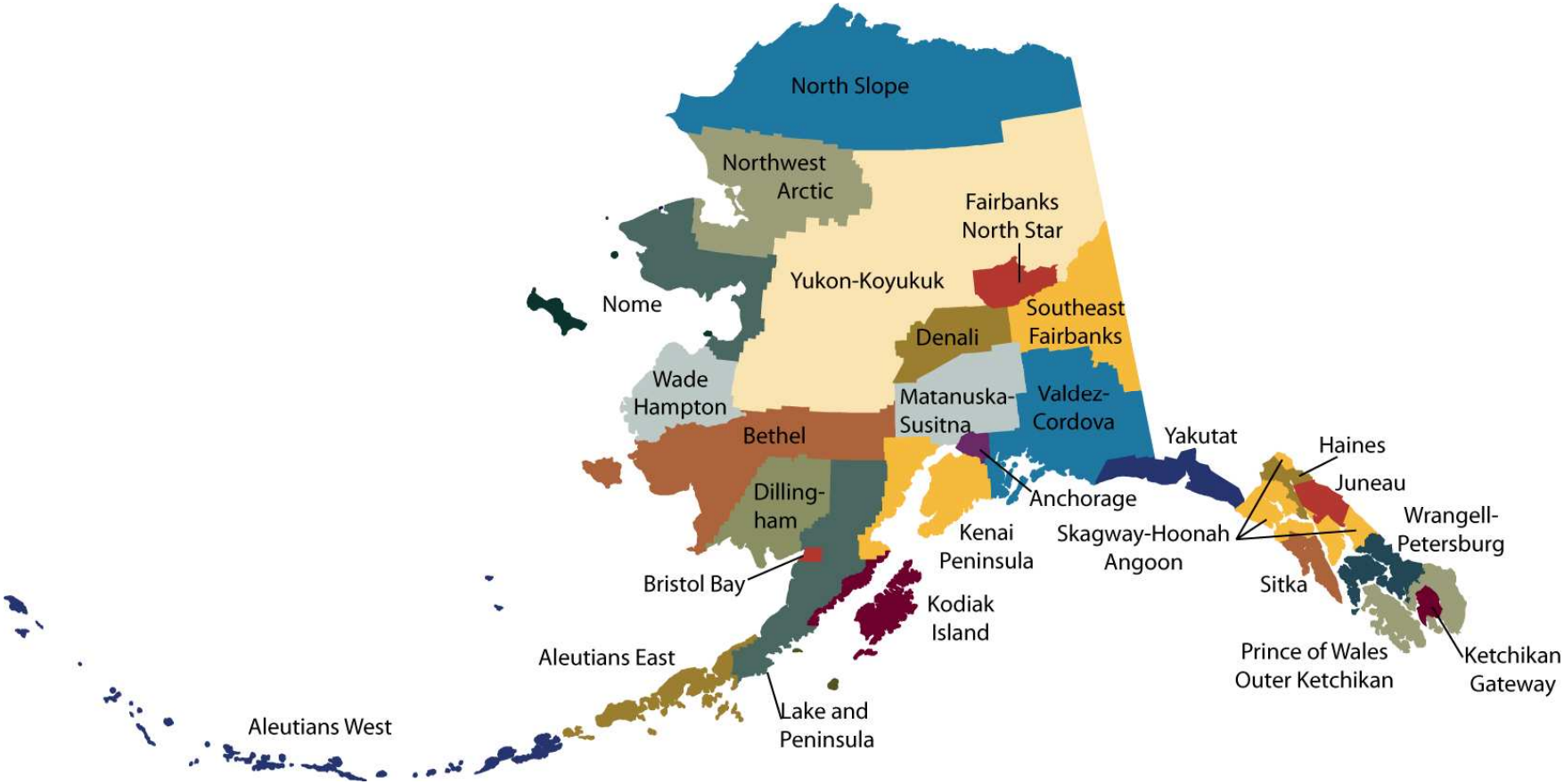


Figure 3: Map of Alaska Boroughs and Census Areas

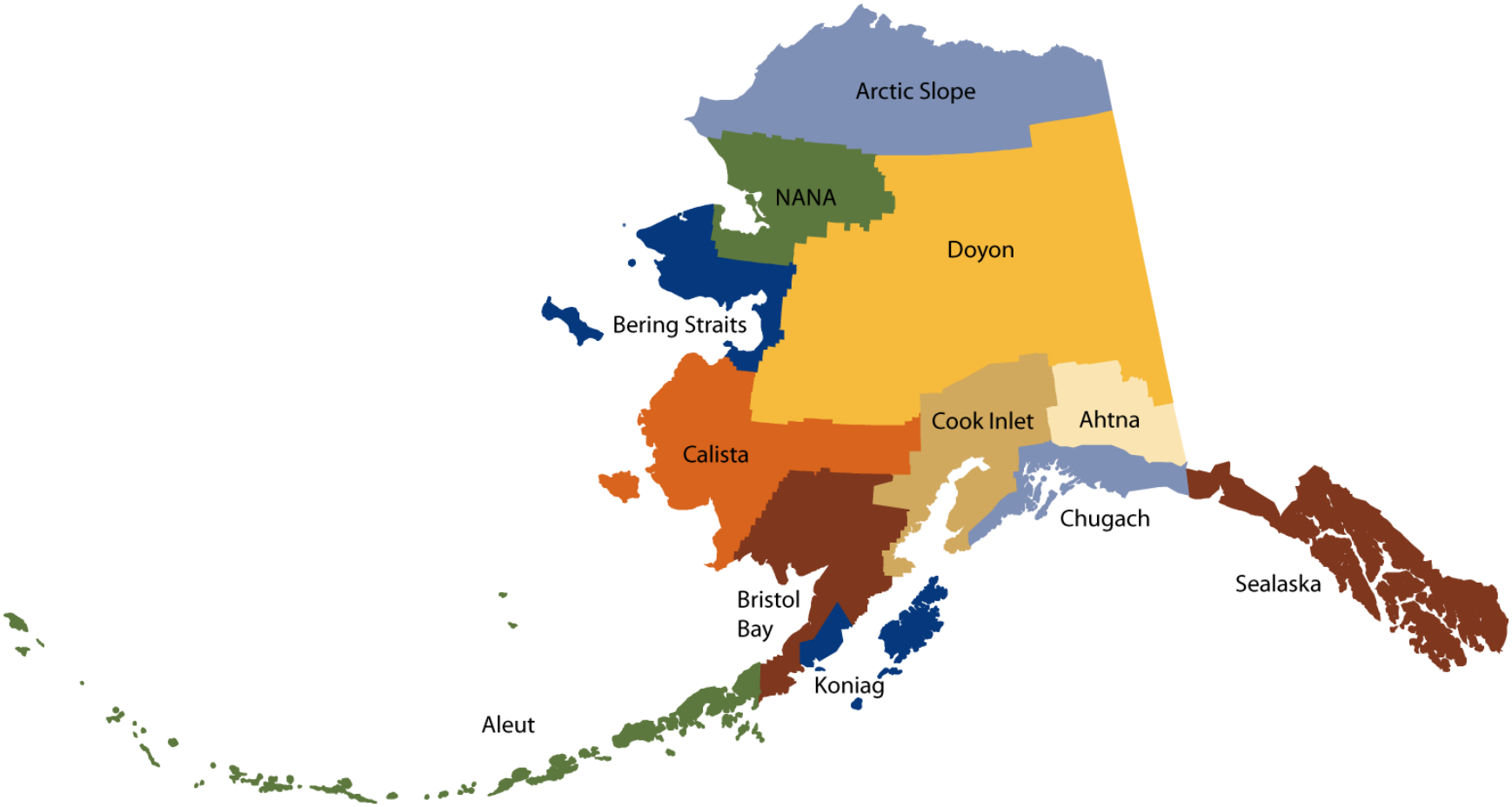


Figure 4: Map of Alaska Native Corporation regions

Estimating Housing Stock

In non-census years, the U.S. Census Bureau publishes estimates of new housing units by census area. These estimates rely primarily on permitting offices for their information. Information Insights contacted permitting offices throughout the state and received the same information. However, much of Alaska lies in unorganized boroughs where permitting is not required. Even within organized areas not all activity is reported all of the time.

A more accurate indicator of activity is the number of new housing units reported in the Housing Market Indicators Report, researched by the Alaska Department of Labor research section and published quarterly.

New units reported in the Market Indicators Report is supplemented in this report by information on new units (built 2005-2007) provided by Alaska Native Regional Housing Authorities (RHA.)

In cases where the Market Indicators Report did not report any new units in a community but the housing authority reported having constructed units; the project team inserted housing authority data. The resulting number does not consider housing units currently under construction or units demolished since 2000 as there is no reliable source for comprehensive demolition information.

Getting a solid housing count is difficult even in organized boroughs and urban parts of the state. Many boroughs encompass several distinct communities and do not gather building information in a central location - sometimes their member cities do not collect new housing data at all. We highly recommend a quick update to the report when 2010 census housing data becomes available.

The project team also reviewed electric utility information from Power Cost Equalization (PCE) covering nearly 200 communities around the state. Since communities have to submit documentation to be included in the PCE program, it is not uncommon for the list of PCE communities to vary from year to year. This information was used to check the accuracy of numbers reported in the Alaska Housing Market Indicators Report and U.S. Census estimates of new housing stock. Electric utility information provided a useful check on accuracy of housing stock estimates in areas of the state with no permitting practices. There were no communities in which estimates varied dramatically from residential electric utility customers.

Table 2 shows estimates of new housing units by census area and type of unit.

Table 2. Estimate of new housing units, 2001-2007

Census area	Single family	Multi family	Mobile	All units	% of new units
Aleutians East Borough	9	13	0	22	0.09%
Aleutians West CA	28	18	0	48	0.19%
Anchorage, Municipality	5,218	6,537	0	11,755	46.76%
Bethel CA	230	34	0	264	1.05%
Bristol Bay Borough	14	4	0	18	0.07%
Denali Borough	4	0	1	5	0.02%
Dillingham CA	41	44	0	85	0.34%
Fairbanks North Star Borough	1,803	747	4	2,554	10.16%
Haines Borough	76	2	0	78	0.31%
Juneau Borough	542	240	25	864	3.44%
Kenai Peninsula Borough	656	169	5	830	3.30%
Ketchikan Gateway Borough	192	70	1	263	1.05%
Kodiak Island Borough	273	94	28	395	1.57%
Lake & Peninsula Borough	2	0	0	2	0.01%
Mat-Su Borough	4,968	1,369	36	6,373	25.35%
Nome CA	83	31	1	115	0.46%
North Slope Borough	54	2	0	56	0.22%
Northwest Arctic Borough	108	130	0	240	0.95%
Prince of Wales Outer Ketchikan	58	33	20	111	0.44%
Sitka Borough	233	186	11	430	1.71%
Skagway Hoonah Angoon	53	33	5	91	0.36%
Southeast Fairbanks CA	4	0	0	4	0.02%
Valdez Cordova CA	152	27	7	186	0.74%
Wade Hampton CA	111	7	0	130	0.52%
Wrangell Petersburg Census	97	33	7	137	0.55%
Yakutat Borough	4	1	0	6	0.02%
Yukon Koyukuk CA	71	0	4	75	0.30%
Statewide	**15,084**	**9,824**	**157**	**25,137**	

Note: More than 72 percent of new housing units occurred in Anchorage and Mat-Su borough.

The three tables on the following pages show the estimated 2008 housing units by Alaska Native region, Census area, and finally by the community level categorizations created for this report. The last table, housing estimates by community level, provides the basis for estimating housing need and is used throughout the report.

Table 3 provides the estimated total number of housing units for 2008 by Alaska Native Region. A large majority of the state's housing stock, as well as its' population, resides in the four largest Native regions: Calista, Cook Inlet, Doyon and Sealaska.

Table 3: Estimated housing stock by Alaska Native region

ANCSA region	No. of households 2008 (est.)	ANCSA region	No. of households 2008 (est.)
Ahtna	2,128	Cook Inlet	167,658
Aleut	3,030	Doyon	44,005
Arctic Slope	2,577	Koniag	5,521
Bering Straits	3,777	NANA	2,753
Bristol Bay	4,511	Sealaska	34,278
Calista	7,667		
Chugach	5,592	**Statewide**	**283,497**

Table 4: Growth in the number of households, 2000-08

Census Area	No. of households 2000 U.S. census	No. of households 2008 (est.)	% Change 2000-2008
Aleutians East	724	747	3.2%
Aleutians West	2,234	2,283	2.2%
Municipality of Anchorage	100,368	112,269	11.9%
Bethel Census Area	5,188	5,503	6.1%
Bristol Bay Borough	979	979	4.7%
Denali Borough	1,351	1,355	0.3%
Dillingham	2,332	2,409	3.3%
FNSB	33,291	35,652	7.1%
Haines	1,419	1,486	4.7%
Juneau	12,282	13,115	6.8%
Kenai Peninsula Borough	24,871	25,690	3.3%
Ketchikan Gateway Borough	6,218	6,331	1.8%
Kodiak Island Borough	5,159	5,521	7.0%
Lake & Peninsula Borough	1,191	1,193	0.2%
Mat-Su Borough	27,329	31,816	16.4%
Nome	3,649	3,777	3.5%
North Slope Borough	2,538	2,577	1.5%
Northwest Arctic Borough	2,540	2,753	8.4%
Prince of Wales Island	3,055	3,144	2.9%
Sitka	3,650	4,061	11.3%
Skagway-Hoonah-Angoon	2,108	2,243	6.4%
Southeast Fairbanks Census Area	3,225	3,228	0.1%
Valdez-Cordova	5,148	5,320	3.3%
Wade Hampton	2,063	2,164	4.9%
Wrangell-Petersburg	3,284	3,393	3.3%
Yakutat City & Borough	499	505	1.2%
Yukon Koyukuk	3,917	3,983	1.7%
Total	**260,568**	**283,497**	**8.8%**

Table 4 provides the estimated total number of households in 2008 by census area. Total number of households increased around 12 percent between the 1990 and 2000 census; the estimated increase of 8.8 percent between 2000 and the beginning

of 2008 shows a similar growth rate. In contrast, the U.S. Census counted a nearly 41 percent growth in the number of households in Alaska between the 1980 and 1990 census with more than 100 percent growth in the Mat-Su Borough and more than 80 percent growth in the North Slope Borough and Prince of Wales Island. The largest growth rates in housing stock occurred in the Mat-Su borough and Municipality of Anchorage; the least amount of growth occurring in the Southeast Fairbanks census area and the Lake and Peninsula borough.

Table 5 provides the estimated total number of housing units for 2008 by community level classification – Anchorage, Fairbanks, Other Urban, Rural 1 and Rural 2. These estimates form the basis for this report.

Table 5: Number of Alaska households by community level, 2000-08

Community level	No. of households 2000 U.S. census	No. of households 2008 (est.)	% Change 2000-2008
Anchorage	100,368	112,269	11.9%
Fairbanks	33,291	35,652	7.1%
Other urban	42,424	49,656	17.0%
Rural 1	61,614	62,268	1.1%
Rural 2	22,915	23,652	3.2%
Total	260,612	283,497	8.8%

Most of the housing stock in Alaska – 87.5 percent – is wood frame construction. The second most common type of construction is log at just under seven percent of the total, followed by mobile homes which make up four percent of total housing stock. The remaining two percent of homes fall under the category of "other" type of construction and reflect Alaska ingenuity with examples of homes made from concrete, plastic panels, foam blocks, etc.

Energy Use

Household Energy Consumption

Household energy consumption has been at the front of minds of policy makers and home owners alike since fuel prices peaked in the spring and summer 2008. When Alaska's capitol city was threatened with a fivefold increase in electricity costs in the spring of 2008 it was another reminder of how vulnerable we are to both natural disasters like avalanches and commodity prices set on world markets. There is compelling evidence from across the world, as well as here in Alaska, that low cost energy leads to increased energy consumption. Urban communities that enjoy low energy costs – Juneau with cheap electricity and Anchorage with cheap natural gas – have consumption rates far higher than rural communities where energy is more expensive.

Overall, Alaska ranks number one in energy consumption per capita in the United States, but much of this energy use is associated with industrial activity and transportation. Alaska's residential end-use energy consumption represents 0.3 percent of total U.S. end-use energy consumption, slightly over the 0.2 percent of the total U.S. population that lives in Alaska. Residential end-use energy consumption in Alaska was 61,658 billion BTU in 2006.[4] Space heating accounts for around 45 percent of the total energy used to run a home. What this tells us is that Alaska's residential energy consumption is close to being in line with the rest of the country, especially when the high number of heating degree days in Alaska are taken into account.[5] Where we by far outpace other states is in per capita transportation and industry energy consumption.[6]

A primary focus of this study has been household energy consumption for space heating. The building community in Alaska has long understood the costs associated with failing to build and design for cold climates. Recent increases in energy cost has brought that awareness to homeowners as well.

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[4] This is the most recent full-year data from the national Energy Information Administration. Complete 2007 data will be released by the EIA in August 2009.

[5] Alaska ranks first in the nation in average Heating Degree Days (HDD.) HDD is a climate statistic published by the U.S. Department of Commerce National Climatic Data Center (NCDC) to compare the severity and length of the heating season in different locations. It equals the sum for the year of the average hourly temperature difference between the outside air temperature and 65°F (when outside air temperature is less than 65°F.) Source: http://apps1.eere.energy.gov

[6] Energy Information Authority State Energy Data System http://www.eia.doe.gov/

A WORD ABOUT BRITISH THERMAL UNITS

British thermal units or BTUs are a useful equalizer when talking about energy use. A British thermal unit is the amount of heat energy needed to raise the temperature of one pound of liquid water by one degree Fahrenheit at one atmosphere pressure. This is the standard measurement used to express the amount of energy a fuel has, as well as the amount of output of any heat-generating device.

Converting energy consumption into BTUs allows us to compare apples to apples; it can be cumbersome to think about how 50 gallons of heating oil stacks up next to 10 cords of wood but both fuel types can be easily converted to BTUs. The table below shows the BTU values used to convert survey data on home energy consumption into BTUs.

Table 6: BTU conversion values by fuel type[7]

Fuel type	BTUs		Natural unit
Heating oil	139,000 BTUs	per	Gallon
Natural gas	102,800 BTUs	per	100 cubic feet (CCF)
Electricity	3,412 BTUs	per	kilowatt hour (kWh)
Propane	91,000 BTUs	per	Gallon
Wood (1)	20,300,000 BTUs	per	Cord
Coal	20,034,000 BTUs	per	short ton (2,000 lbs.)
Kerosene	135,000 BTUs	per	Gallon

Note: (1) The BTU value for white spruce was used for all wood conversions because it was not clear what type of wood was being used in many households; white spruce is a median value wood for Alaska.

All information on energy use in this report is presented in BTUs rather than dollars. With wide variation in the cost of fuel in different parts of the state and significant fluctuations in world fuel prices over time, it is less useful to try to figure out how many dollars were spent, or might be spent, on home heating than to focus on how MUCH energy is being consumed. Easy methods for converting BTUs to natural units for each fuel type (gallons, cords, etc.) and for estimating fuel cost will be provided in the appendices with examples included in the body of the report.

The average urban household in Alaska's largest city used just shy of 90,000 BTU/ft^2 for space heating in 2008, while the average household in the most remote parts of the state used nearly 116,000 BTU/ft^2. Keep in mind, however, that the average household in the smallest and most remote (Rural 2) communities uses fewer total BTUs than the average household in urban Alaska. This finding is consistent with other studies that have found rural households use less energy than their urban counterparts in large part because houses tend to be smaller.

[7] Btu conversion values for fuel used in this report are provided by the Energy Information Administration http://www.eia.doe.gov/

Table 7: Energy use for space heating by community level

Community level	Average BTUs/ft^2	Median housing unit size (ft^2)	Median annual energy use per household (000s Btus)
Anchorage	87,894	1,960	171,162
Fairbanks	90,013	1,700	150,700
Other urban (1)	75,818	1,800	140,322
Rural 1	91,486	1,554	140,800
Rural 2	115,833	1,056	122,610

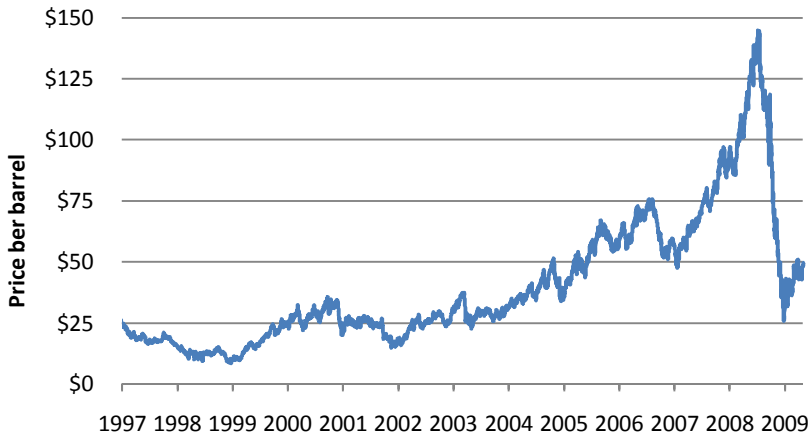
Note: (1) Most "Other urban" communities are in Southeast Alaska, where the climate is more temperate.

Table 7 shows the median size of a housing unit for each community type as well as the median amount of energy used for space heating. The median Btu per household is not simply the size of median housing unit multiplied by the average BTUs per square foot. Each housing unit is impacted by several variables that determine energy consumption including, but not limited to, home size.

Fuel Costs

The cost of fuel varies dramatically across the state. The last two years have seen fuel costs for home heating, electrical generation and transportation that have crippled communities and prompted the state government to send out supplemental cash payments to every Alaskan to assist with household energy costs.

Figure 5: Price history for ANS Crude oil, 1997-2009



The cost of fuel in rural communities has been high for a long time and is based on a number of factors including transportation costs, volume, and financial risk profiles associated with each community. There is no single place, or organization, where fuel prices are collected for all Alaska communities. However, recent efforts have lead to coordination in the collection of fuel price data so that now, more uniform methodologies are employed, and the same questions are being asked in fuel surveys conducted by multiple entities.

The organization with the most data is the Alaska Housing Finance Corporation, which collected fuel price information from nearly 200 communities in June 2008. The price of fuel, like the price of building materials and everything else that must be shipped to remote communities, is impacted most heavily by transportation costs. Rural 2 communities pay the highest prices for regular heating oil, which averaged $5.70 per gallon (excluding the North Slope) in June 2008. The next highest prices were in Rural 1 communities with average per gallon costs just under $5. The least expensive heating oil was found in Urban communities coming in at just under $4.50 per gallon (not including Urban communities that depend on natural gas).

The project team obtained fuel prices directly from local and regional sources for communities included in the 2008 housing survey for which AHFC lacked fuel price data. Prices for less commonly used fuels such as wood and coal were also obtained from local vendors and regional studies when appropriate. The resulting fuel price dataset was used to estimate actual fuel consumption for survey respondents who knew how much they paid for heating fuel but not how much fuel they used. Prices for heating oil in June 2008 ranged from a high of $9.10 per gallon in Kokhanok to a heavily subsidized low of $1.00 per gallon in Barrow.

With this data it is possible to determine that a survey participant who reported paying $100 every two months in Barrow for heating oil uses approximately 50 gallons per month or 600 gallons per year for space heating. This was then converted into BTUs for comparison purposes.

BTU CONVERSION

The great majority of respondents use regular heating fuel or natural gas for space heat in their homes. Table 8 displays the primary type of fuel used for space heat for different urban and rural classifications.

Table 8: Primary fuel type for space heating by community level, 2008

	Anchorage	Fairbanks	Other urban	Rural 1	Rural 2
Heating Oil	1.5%	86.1%	53.1%	39.2%	81.5%
Natural Gas	93.2%	1.3%	30.8%	46.5%	0.5%
Electricity	3.8%	1.3%	5.6%	3.4%	0.3%
Wood	0.8%	9.5%	7.7%	8.6%	17.2%
Other	0.8%	1.8%	2.8%	2.3%	0.5%

Natural gas is the clear choice in areas of the state where it is available. The rest of the state is still reliant on heating oil. The use of wood as a primary space heating fuel is only significant in the smallest remote communities (Rural 2) and in Fairbanks. The category of "other" fuels includes coal, propane, kerosene and other bottled gas, and wood pellets.

To estimate the average cost of home heating for a community or region we can simply convert the average BTUs per square foot into the fuel used in the area and

then multiply it by the cost of fuel at any point in time. For example, in Fairbanks the average home uses 90,013 BTUs/ft^2 for space heat. We know that more than 86 percent of these homes use heating oil for space heat. We also know that the average home size is 1,882 square feet, and that heating oil has a value of 139,000 BTU per gallon. The following equation is applied:

BTUs per square foot	×	**Avg. size of housing unit**	=	**Avg. BTU per housing unit**
90,013	×	1,882 square feet	=	169,404,466 BTU
Avg. BTU per housing unit	÷	**BTU per gallon of heating oil**	=	**Avg. gallons per housing unit**
169,404,466	÷	139,000	=	1,219 gallons
Avg. gallons per housing unit	×	**Fuel cost per gallon**	=	**Avg. home heating cost**
1,219	×	$4.55	=	$5,546

Using the formulas above we can estimate the average home heating cost at any time since the BTUs per square foot will remain the same regardless of fluctuations in the price of fuel.

Analysis of Alaska Retrofit Information System (ARIS) Data

The Alaska Housing Finance Corporation maintains a database (called ARIS) that holds all of the energy ratings performed for its weatherization program, Building Energy Efficiency Standard (BEES) certification, and the Home Energy Rebate program (AKRebate). The database holds tens of thousands of records for individual housing units and multiplexes including estimated energy consumption and recommended improvements for each unit. ARIS is an important source of information about household energy consumption in Alaska. The project team analyzed data entered into ARIS in 2007 and 2008.

Table 9: Household energy use by fuel type, ARIS 2007-08

Fuel type	No. of records 2007-08 (1)	Average annual energy use (000s BTUs)
Birch	207	168,759
Coal	10	174,020
Gas	3,126	196,887
Oil1	986	132,041
Oil2	1,996	227,665
Propane	90	119,522
Spruce	440	92,972
Total	**6,855**	

Note: (1) ARIS data reveals a marked increase in ratings in 2008 following the State's increase in weatherization funding.

Table 9 lists the number of ARIS records that include space heating data by fuel type and the average Btus for each fuel type. The Btu estimate for each record is generated by AKWarm software used by raters at the time of the energy rating. These numbers are slightly higher, but consistent with, estimates derived for this study from household survey data (shown in Table 7).

The tables that follow provide additional information for Alaska housing units that received energy ratings in 2007 and 2008. The majority of housing units rated in 2007 and 2008 were stand-alone single family houses. This is in keeping with survey findings and census data about housing in Alaska.

Table 10: Housing type, ARIS 2007-08

Housing type	No. of records 2007	% of total 2007	No. of records 2008	% of total 2008
Single Family	1016	81.5%	4,751	90.5%
Multi Family (Whole building)	30	2.4%	101	1.9%
Multi Family (One unit)	201	16.1%	358	0.7%
Mobile Home (1)	--	--	39	6.8%

(1) Mobile homes were added as a field for housing type in 2008.

Table 11 shows average square footage and annual energy cost estimates for homes rated in 2007 to 2008. The data does not show a significant variation in average home size across several decades (although like Btu per house the numbers are slightly higher), nor does it show substantial differences in energy costs. The notable exception being new homes, built 2000 to 2008, which appear to be at least twice as cheap to heat – presumably because they have been built to higher energy standards and with newer materials.

Table 11: Energy cost and home size by age of housing unit, ARIS 2007-08

Construction date	No. of records	Average home size (ft^2)	Average annual energy cost
1930-1939	34	2,055	$7,864
1940-1949	67	1,882	$5,968
1950-1959	297	1,850	$6,206
1960-1969	514	2,098	$6,109
1970-1979	1,472	2,196	$6,271
1980-1989	1,640	2,116	$5,867
1990-1999	408	2,319	$6,202
2000-2008	1,886	1,993	$2,847

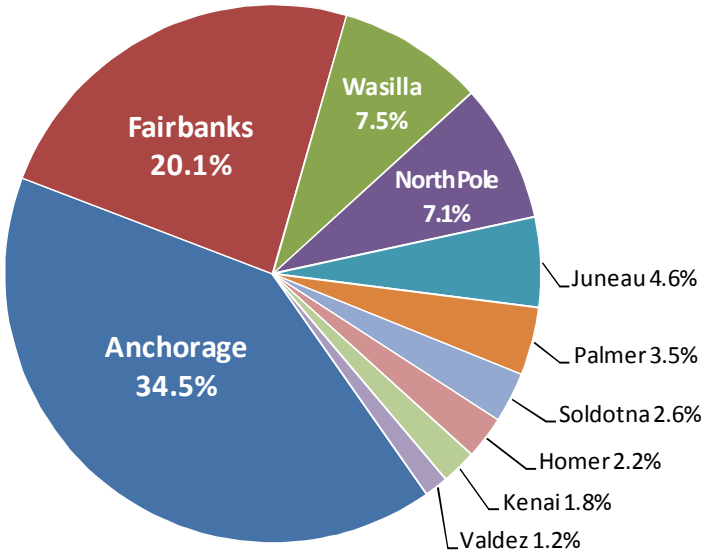
Note: Differing total records are due to blank fields in the database where a record existed but the square footage variable was blank. There were also more than 100 records for homes constructed prior to 1930. However, these records have minimal representation and the dates cannot be verified so they were excluded from analysis.

HOME ENERGY REBATE PROGRAM PARTICIPATION

Although the ARIS data include housing in all parts of the state, energy- rated homes that are have completed the Alaska Home Energy Rebate program are clustered by

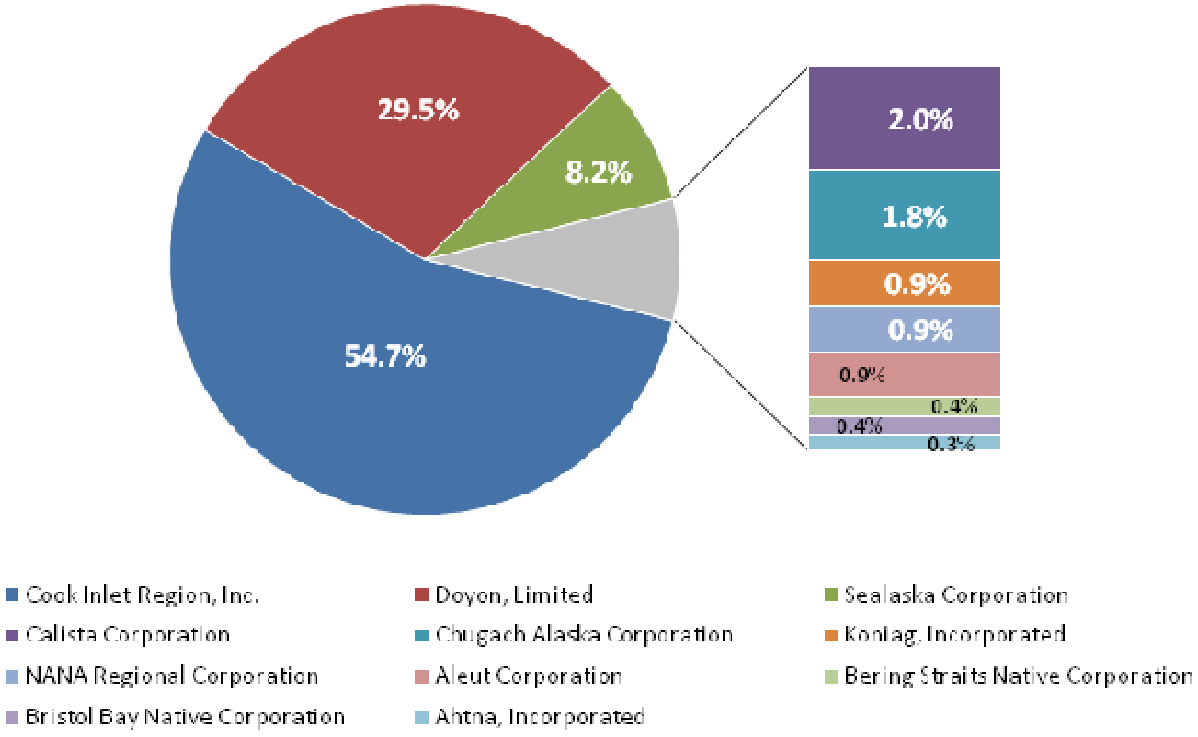
geography in 2007 and 2008, with urban areas having a higher level of participation, Anchorage, Fairbanks and Wasilla combined accounted for over 60 percent of ratings done in the state in 2007-2008 Figure 6 shows participation rates the top ten communities in 2007-08.

Figure 6: Energy rating participation rates by community: Top 10 communities represented, 2007-08



The project team also analyzed data by Alaska Native regional corporation boundaries. Native corporation regions are used as inclusive geographies in this report; therefore non-shareholder households are included in totals for each region. Looking at Figure 7, it is not surprising to note that regional Native corporation boundaries encompassing larger populations also have higher participation rates.

Figure 7: Energy rating participation by Native corporation region, 2007-08



The 2007-08 ARIS data provides average household energy consumption for space heating by fuel type (see Table 12.) The data also includes square footage and electric cost by household, as shown in Table 13, please note that the database is small and thus vulnerable to being pulled significantly by outliers and that the houses are more heavily weighted toward rural communities.

Table 12: Average household energy use in MMBtu (million Btu) for space heating, ARIS 2007-08

Native corporation region	Birch	Coal	Electric	Gas	Oil 1	Oil 2	Propane	Spruce
Cook Inlet	166.8	na	4.0	170.1	133.2	140.6	98.2	154.0
Doyon	121.8	155.5	3.0	149.7	110.3	207.7	68.1	107.7
Sealaska	65.3	na	16.5	31.9	119.7	177.9	89.3	87.4
Calista	53.4	na	1.2	na	56.0	109.2	na	27.0
Chugach	64.3	na	4.3	na	170.9	145.2	126.8	98.2
Koniag	na	na	1.8	na	60.4	146.4	na	71.7
NANA	38.1	na	1.6	na	59.6	147.3	na	44.4
Aleut	na	na	1.1	15.8	31.1	71.3	5.5	Na
Bering Straits	na	na	1.5	na	115.8	16.5	na	Na
Bristol Bay	107.3	na	1.6	na	80.9	Na	na	42.1
Ahtna	246.8	na	3.1	na	166.6	110.0	24.0	125.7

Note: Not all fuel types are available in all regions. There are no records matching the Arctic Slope region in the ARIS dataset for 2007-08. Because the frequency of ratings is not equally distributed across the state, analysis of energy use data for the rural areas is less reliable, especially where there are only a couple records for a specific fuel type.

Table 13: Annual house size and electric cost per household by Native corporation region, ARIS 2007-08

Native Regional Corporation Boundary	Average housing unit size (ft^2)	Average annual electric cost
Cook Inlet Region, Inc.	2,143	$3,406
Doyon, Limited	2,218	$7,925
Sealaska Corporation	1,902	$6,072
Calista Corporation	826	$4,431
Chugach Alaska Corporation	2,099	$8,222
Koniag, Incorporated	1,894	$6,186
NANA Regional Corporation	1,193	$7,383
Aleut Corporation	1,342	$4,565
Bering Straits Native Corporation	1,621	$5,950
Bristol Bay Native Corporation	1,279	$6,573
Ahtna, Incorporated	2,170	$7,247

AHFC Weatherization Program

The Alaska Housing Finance Corporation administers a grant program for the purpose of improving the energy efficiency of low-income homes statewide. Funds for weatherization come from the U.S. Department of Energy and from AHFC. Grants are given by AHFC to nonprofit weatherization service providers. Over the past 30 years there have been five primary recipients of this funding who administer weatherization programs in the following areas:

Alaska Community Development Corporation

- Mat-Su Borough, Kenai-Peninsula Borough
- Copper River Valley (Tok to Cordova)
- Southeast Alaska (except Juneau)
- Kodiak (road connected communities only)
- Bristol Bay
- Prince William Sound
- Aleutians

Interior Weatherization

- Fairbanks/NSB
- Road System: South to Cantwell and East to Delta Junction
- Tanana Chiefs Conference

Municipality of Anchorage

- Municipality of Anchorage

Rural Alaska Community Action Program (Rural CAP)

- Western Alaska
- Northern Alaska
- Juneau

Annual state funding for the weatherization program has been around $4 million to $6 million for many years. In 2008 the Alaska legislature appropriated $200 million to AHFC for weatherization programs. This unprecedented level of funding was a direct result of the high fuel prices that were crippling Alaska households – especially lower income households and those in rural communities. The legislature increased the program's income threshold from 60 percent to 100 percent of median household income.

In response to increased funding, weatherization programs have been established within the Alaska Native regional housing authorities to build capacity and expedite service delivery. Low income, elderly and disabled individuals are still given priority on the weatherization waitlist.

We asked survey respondents if their homes had been improved through AHFC's weatherization program in the last 10 years. The highest percentage of homes that

received weatherization services was in Rural 2 communities (8.5 percent), followed by Urban and Rural 1 communities (around four percent each). Among urban communities, there was a significant difference between the state's two largest communities, with Anchorage reporting 3.1 percent of homes having received weatherization services in the past 10 years and Fairbanks reporting nearly twice that many (6.1 percent). Historically, weatherization programs provide services to around 600 homes per year. The amount spent to improve each housing unit varies depending on the condition and location of the home.

According to Oak Ridge National Laboratories, weatherization can decrease energy bills an average of 23 percent. In Alaska, savings are also seen in the costs of running village generators and reducing requirements for state Power Cost Equalization funding – a savings enjoyed by state government. In addition to increasing energy efficiency, weatherization can address mildew and mold problems that plague many households in Alaska causing serious health concerns particularly for children and the elderly.

Home Energy Rebate Program

In 2008, the Alaska legislature appropriated $100 million (and later an additional $60 million) to help Alaska homeowners, regardless of income, decrease fuel consumption by increasing the energy efficiency of their homes through a rebate program. This program is different than weatherization in a few of important ways; participants must own their home, there are no income guidelines, and all improvements must be paid for up front by the homeowner. The Alaska Home Energy Rebate Program (AKRebate) provides a potential benefit to every home in the state that is not already a five star home. It is difficult to estimate the number of five star homes in Alaska because houses built without AHFC underwriting are not required to meet BEES. As a result, they will not appear in the ARIS database unless they become part of either the AHFC weatherization or home energy rebate programs (which is unlikely if they are already five star homes).

With no income guidelines, the home energy rebate program opened the door for assistance to homeowners who do not qualify for the low-income weatherization program. Program guidelines stipulate that to qualify a participant needs to own and occupy the housing unit that will be rated. Each participant is eligible for a rebate of up to $10,000 of the money they spend on energy improvements to their home. The actual rebate amount is based on how much the home's energy efficiency is estimated to have improved after implementing any of the energy improvements recommended by the energy rater. This is determined by looking at the difference between the initial or "as-is" rating and the "post" rating which is done after energy improvements are complete. Ratings are performed by certified home energy raters.

The home energy rebate program offers a unique opportunity by providing the state with a large dataset that includes both pre- and post-improvement measurements of

housing unit energy use. Other programs have relied on norms and estimates generated by software to determine the energy saved by implementing efficiency measures. These estimates are likely based on valid assumptions and produce reasonably sound predictions of energy savings. However, the Alaska Home Energy Rebate Program offers real world data and can be used to ground truth the software used to estimate energy savings in the weatherization program.

The Alaska Home Energy Rebate Program, which started in May 2008, has given the Alaska Housing Finance Corporation for the first time in its history the ability to measure the impact of weatherization efforts at a household level. While the data processing systems are still being refined, the data collection systems are in place, allowing analysis of the matched As-Is and Post-improvement data. At the time of this report only 368 matched sets of data were available. The analysis that follows examines matched records and provides a glimpse of the program's overall potential.

Comparisons of As-Is data matched with the respective Post data indicate that weatherization efforts are successful in improving the energy performance of homes. On average, homes that participate in the program improve by 15.3 percent in rating points, star ratings increase by almost 29 percent, while CO_2 levels drop by almost 35 percent. In addition, homes in the program reduced their energy cost by approximately 30 percent. While individual home findings may vary, the overall picture is an early indicator that the rebate program is effective in improving living conditions in Alaska.

Table 14: Average change per home in the AKRebate program

Factor	As-Is rating	Post rating	Change	% Change
Rating Points	64.2	75.9	11.6	18.1%
Rating Stars	2.7	3.8	1.1	40.0%
CO2	41,195.1	30,630.3	-10,564.8	-25.6%
DHW Energy Factor	-17.1	-17.5	-0.3	1.8%
Energy Cost	5,605.3	4,306.7	-1,298.6	-23.2%
Air Loss	668.8	550.3	-118.6	-17.7%
Appliance Loss	1,313.6	1,216.4	-97.2	-7.4%
Ceiling Loss	285.6	202.7	-82.9	-29.0%
DHW Loss	573.0	551.2	-21.8	-3.8%
Floor Loss	448.3	394.1	-54.2	-12.1%
Heating System Loss	1,380.2	574.5	-805.7	-58.4%
Wall/Door Loss	760.1	694.9	-65.2	-8.6%
Window Loss	271.0	215.4	-55.6	-20.5%
Appliance Use	1,313.6	1,216.4	-97.2	-7.4%
DHW Use	573.0	551.2	-21.8	-3.8%
Space Use	3,805.9	2,624.4	-1,181.4	-31.0%

Table 14 gives further information detailing the average increase in rating stars and points and reductions in other factors, with the biggest drop in Heating System Loss.

Table 15 shows the average energy savings per home for the 368 housing units for which matched data was available at the time of this analysis. After recommended energy improvements were made by the homeowner, average energy savings equaled 600 kWh electricity or nearly one and a half cords of birch or over 600 gallons of number 2 heating oil.

Table 15: Energy savings per home converted to natural units

Average savings per home	Natural unit	Fuel type
747.6	CCF	Gas
256.9	Gallon	Oil1
633.5	Gallon	Oil2
600.0	Kwh	Electricity
145.1	Gallon	Propane
1.45	Cord	Birch
1.2	Cord	Spruce
--	Ton	Coal

Energy Efficiency Indicators in the 2009 Housing Assessment

ABILITY TO MAINTAIN TEMPERATURE

In 1990 it was estimated that 20,824 homes statewide were unable to maintain a comfortable indoor temperature on the coldest days of winter. The 2005 housing assessment found 24,445 homes fit this category, and the 2008 survey produced more than 27,000 homes.

The surprising 13.5 percent increase from 2005 to 2008 in the estimate of housing units unable to maintain a comfortable room temperature is larger than the overall increase in housing stock, which was 8.8 percent for the period. This disparity may be partially explained by the unprecedented high energy prices that plagued the state last winter; survey respondents' difficulty in keeping houses at 70 degrees Fahrenheit may be more reflective of their ability to pay for fuel than of a precipitous deterioration in the condition of Alaska's housing stock. Table 16 reports the findings of the 2008 survey by community classification.[8]

Conventional wisdom about housing stock in Alaska tells us that the more remote a community is the worse the condition of the housing will generally be. Survey findings confirm this. The percentage of homes unable to maintain temperature

[8] It is important to note that the ability to maintain a comfortable temperature during the coldest days of winter is both a function of the condition of the home and the residents' income. We talked to people who said "Yes, we can keep our house warm. It just costs a lot." These responses are not included in the number or percent of households unable to maintain a comfortable temperature.

increases from urban to large rural communities (Rural 1) and then increases again between large rural and small or very remote rural communities (Rural 2).

Table 16: Households unable to maintain temperature by community level, 2008

Community level	Total no. of households, 2008 (est.)	Households unable to maintain 70° F on the coldest days of winter	
		No.	%
Anchorage	112,269	7,958	7.1%
Fairbanks	35,652	2,408	6.8%
Other urban	49,656	5,214	10.5%
Rural 1	62,268	7,009	11.3%
Rural 2	23,652	5,150	21.8%
Total	**283,497**	**27,739**	**9.8%**

WINDOWS AND FLOORS

The table below presents data on the type of windows installed in Alaska homes. Survey participants were asked what the majority of windows in their homes are (single pane, double pane, triple pane). In all parts of the state and at all community levels, double-pane windows are by far the most common. Only in Fairbanks do nearly one third of all housing units have triple-pane windows, At no community level did more than an eighth of homes have a majority of single-pane windows.

Table 17: Window type by community level, 2008

Community level	Single pane		Double pane		Triple pane	
	No.	%	No.	%	No.	%
Anchorage	13,677	12.2%	92,323	82.2%	5,414	4.8%
Fairbanks	2,679	7.5%	21,151	59.3%	11,822	33.2%
Other urban	5,214	10.5%	41,661	83.9%	2,781	5.6%
Rural 1	7,393	11.9%	50,932	81.8%	3,450	5.5%
Rural 2	2,941	12.4%	19,210	81.2%	1,251	5.3%

Note: Response to the question, "Are the majority of windows in your house single-, double-, or triple-paned?"

The survey asked several other questions that are good indicators of the construction quality and energy efficiency of a home. Table 18 shows survey participants' responses to the question, "During the winter is the floor of your house cold, chilly, comfortable, or warm?" for each community classification. Comfortable floors are most prevalent in all but Rural 2 communities where nearly 40 percent of respondents reported cold floors and 30 percent said floors were chilly.

Table 18: Winter floor temperature by community level, 2008

Response (1)	Anchorage	Fairbanks	Other urban	Rural 1	Rural 2
Cold	5.5%	11.3%	7.6%	13.6%	39.3%
Chilly	17.6%	20.1%	26.4%	22.3%	29.6%
Comfortable	62.0%	49.6%	50.7%	47.1%	24.0%
Warm	14.9%	19.0%	15.3%	17.0%	7.1%

Note: (1) Response to the question, "During the winter is the floor of your house…?"

OTHER INDICATORS

The table below shows the estimated number and percent of Alaska homes that can be considered "drafty." We asked survey participants the question, "When the wind blows, does it come through your windows, doors, or floor?" Not surprisingly, residents of Rural 2 communities answered yes to that question much more often than Rural 1 and Urban residents.

Table 19: Draftiness of homes by community level, 2008

Community level	No. of housing units, 2008	Drafty homes (1)	
		No.	%
Anchorage	112,269	40,417	36.0%
Fairbanks	35,652	10,090	28.3%
Other urban	49,656	17,231	34.7%
Rural 1	62,268	29,675	47.7%
Rural 2	23,652	17,661	74.7%
Total	**283,497**	**115,073**	**40.6%**

Note: (1) Draftiness homes defined as "When the wind blows, does it come through your windows, doors, or floor?"

We also asked people if ice builds up anywhere in their homes in the winter. Fewer respondents reported ice buildup than draftiness; respondents said yes in just over half of Rural 2 homes (52.6 percent), less than a third of Rural 1 homes (29.9 percent), and less than a quarter of all Urban homes (23.4 percent). What is telling is that whether the question is draftiness or ice buildup or mold/mildew (see Table 21), the relative proportions remain fairly consistent, with a much higher percentage of poor housing condition and energy efficiency indicators in small, isolated, rural communities than in larger or highway-connected rural communities or urban areas.

Table 20: Ice buildup inside home by community level, 2008

Response (1)	Anchorage	Fairbanks	Other urban	Rural 1	Rural 2
Yes (%)	15.3%	34.4%	15.9%	29.9%	52.6%
Yes (No.)	17,207	12,250	7,895	18,631	12,452

Note: (1) Response to the question: "Do you get ice build up anywhere on the inside of you house?"

Table 21: Mold or mildew around windows by community level, 2008

Response (1)	Anchorage	Fairbanks	Other urban	Rural 1	Rural 2
Yes (%)	10.8%	16.7%	17.2%	20.9%	37.4%
Yes (No.)	12,160	5,942	8,541	13,006	8,838

Note: (1) Response to the question, "Is there any mold or mildew around your windows?"

Household Variables

This section presents more detailed information on the characteristics of the 1,700 Alaska households surveyed for the 2009 housing assessment.

Eighty-five percent of the households surveyed live in single-family homes; just under five percent live in duplex units; 6.5 percent live in multi-family units; 3.5 percent live in mobile homes, and just one-tenth of one percent fall into the "other" category. These housing units ranged in age from brand new to 111 years old.

Just over seventy percent of survey respondents reported their race as Caucasian, and 19.5 gave their race as Alaska Native or American Indian. The remaining 7.3 percent of respondents reported their primary race as African American, Hispanic, Asian or Pacific Islander, or other.

One in four respondents reported a household income of less than $35,000 per year, while more than half reported incomes between $35,000 and $100,000 per year. A little over one-third of all respondents said they have had a friend or family member stay with them because the person did not have a home. The majority of these stays were reported to be less than one year.

The housing variables covered in this section include:

- Size of home
- Age of home
- Condition of home

House Size

Table 22 displays square footage of homes by community classification. The largest share of homes at all community levels is in the 1,001 to 2,000 ft^2 range, however in Rural 2 communities that share (39.7 percent) is only slightly bigger than housing units that fall into the 501 sq ft to 1,000 ft^2 range (36.9 percent). Anchorage has the highest percentage of homes larger than 1,000 ft^2 (87.1 percent), while Rural 2 communities have the highest percentage of homes falling at or below 1,000 ft^2 (49.4 percent.)

Table 22: House size by community level, 2008

House size (ft^2)	Anchorage	Fairbanks	Other Urban	Rural 1	Rural 2
Less than 500	0.8%	3.0%	0.0%	2.0%	12.5%
501 to 1,000	12.0%	15.2%	16.8%	16.2%	36.9%
1,001 to 2000	46.2%	48.2%	45.8%	54.0%	39.7%
More than 2,000	40.9%	33.6%	37.4%	27.7%	10.8%
Mean	2,074	1,882	1,975	1,730	1,226
Median	1,960	1,700	1,800	1,554	1,056

Table 23 gives mean and median home size per person in households around the state. Households in small rural communities have less than half the square footage per person as households in urban areas. This is a function of both smaller houses and more people per household.

Table 23: Mean and median house size per person, 2008

Community level	Mean no. of people per house	Mean ft^2 per person	Median no. of people per house	Median ft^2 per person
Anchorage	2.60	798	2.00	980
Fairbanks	2.67	706	2.00	850
Other urban	2.79	708	2.00	900
Rural 1	2.82	613	2.00	777
Rural 2	3.69	332	3.00	352

The average square footage per resident has increased since the 2005, when the estimated living space per person was 452 ft^2 statewide – ranging from a high of 641 ft^2 in Southcentral Alaska to a low of 212 ft^2 in remote western Alaska communities. While the mean and median house size has increased slightly, the real change is due to a decrease in the number of people per household.

There are parts of rural Alaska where overcrowding is worse than in others. Remote communities in western and northwestern Alaska have among the highest rates of overcrowding in the country. It is also clear there are communities within the same region that have dramatically different rates of overcrowding. With a large enough sample size we can make statistically significant statements about conditions and crowding. It is important for policy makers to consider higher level housing data when making decisions about how to target funds.

Age of Housing Stock

Age plays an important role in the condition of housing stock. As housing units age they, like everything else, begin to deteriorate. Unless the owner has the financial means or the skills necessary to provide maintenance the housing unit may fall into disrepair. In Alaska the age of housing stock has additional meaning for energy use. Much of the housing stock built in Alaska prior to the implementation of the Built Energy Efficiency Standards (BEES) by AHFC in 1992 was substandard from an

energy use perspective. BEES helped promote an understanding of improved cold climate construction methods that had been largely lacking beforehand.

The largest percentage of housing stock older than two decades is in the Municipality of Anchorage, according to 2008 survey data. Rural 1 communities have the largest percentage of new housing stock, accounting for over a quarter of all housing units. Survey responses on housing age ranged from brand new to more than100 years old.

Table 24: Age of housing stock, 2008

	0 to 10 years		11 to 20 years		21+ years	
Community level	**%**	**No.**	**%**	**No.**	**%**	**No.**
Anchorage	7.7%	8,681	11.9%	13,310	80.4%	90,278
Fairbanks	19.2%	6,831	15.7%	5,614	65.1%	23,207
Other urban	23.2%	11,514	15.2%	7,556	61.6%	30,585
Rural 1	29.0%	18,148	17.0%	10,489	54.0%	33,631
Rural 2	20.7%	4,898	21.5%	5,091	58.0%	13,663

Condition of Housing Stock

Table 25 displays survey results on the condition of housing units as perceived by the homeowner. The majority of homes at all community levels are believed to be in adequate condition. We have combined responses for "like new", "in good shape" and "in need of minor repair," because these conditions do not require any action at the policy level. Housing units reported to be "in need of major repair" range from a low of 5.1 percent of the housing stock in Anchorage to a high of 25.3 percent (one in four homes) in Rural 2 communities. If repairs are not performed, these units are at risk of becoming unsalvageable at which point they would need to be replaced. Seven percent of homes in Rural 2 communities are said to be "falling apart" and need to be replaced.

Table 25: Condition of housing stock by community level, 2008

	like new/ in good shape/ needs minor repair		In need of major repair		Falling apart	
Community level	**No.**	**%**	**No.**	**%**	**No.**	**%**
Anchorage	106,032	94.4%	5,670	5.1%	567	.5%
Fairbanks	32,068	89.9%	3,032	8.5%	551	1.5%
Other urban	46,207	93.1%	3,103	6.3%	345	0.7%
Rural 2	15,978	67.6%	5,976	25.3%	1,698	7.2%
Rural 1	55,782	89.6%	5,675	9.1%	811	1.3%

Estimated Housing Need

Housing need is estimated using the criteria of overcrowding and a condition of "falling apart." A house is considered overcrowded if there is fewer than 200 square feet per person. There is some duplication between these two categories of housing. Approximately 9.4 percent of homes that are overcrowded are also falling apart. Duplicates are removed to arrive at a final total number of needed housing units.

The project team also estimates the number of homes that would benefit from weatherization services. A house is considered to be in need of weatherization services if the resident reports that they are unable to maintain a comfortable room temperature during the coldest days of winter. The State weatherization program serves households up to 100 percent of median income so a conservative estimate of eligibility is half of estimated housing units in need.

Need created by overcrowded conditions

Using the definition of overcrowding of 200 or fewer square feet per resident we estimate a statewide need for nearly 10,000 additional housing units to alleviate overcrowding. Clearly there are other measures that can be taken to alleviate overcrowding such as expanding on existing housing units. Just under 10 percent of survey respondents who live in overcrowded conditions also report having homes with are falling apart but for the remaining 90 percent who live in homes that are on decent condition but are just too small adding on is a viable and sometimes more cost effective solution.

Table 26: Households with fewer than 200 square feet per resident, 2008

Community level	% of total units	No. of units
Rural 2	20.5%	4,855
Rural 1	3.9%	2,432
Anchorage	1.3%	1,418
Fairbanks	1.5%	551
Other Urban	1.4%	690
Total		**9,946**

As noted in the executive summary, the 2008 estimate of overcrowded housing units is significantly lower than the 2005 estimates or the 1991 estimates. The 2008 estimates of overcrowding are roughly half of the 2005 housing assessment findings. The significant decrease is attributable to a more sophisticated methodology. The 1991 and 2005 housing assessment studies and the Department

of Housing and Urban Development estimates of overcrowding all apply a single percentage to the state housing stock number to arrive at an estimate of overcrowded units. This total number has then been distributed throughout the state based on housing stock in different regions. The total number of housing units estimated to be overcrowded has hovered around 20,000 units. If we apply this same methodology to the 2009 housing assessment we will arrive at a number that is just under 20,000 (18,428 to be exact.)

Using a more refined methodology developed in part because we recognized that applying a single number to a statewide figure would not produce defensible results we arrived at a significantly lower but, we believe, more accurate number.

It is worth noting that even using the old methodology we arrive at a number lower than the 2005 estimate by nearly 3,000 units. The 1991 study did not include any data collection from urban Alaska and appears to have overstated the number of housing units statewide that are overcrowded. When we examine statistically significant findings from the four largest Alaska Native corporations (which represent %% of the total state housing stock) they confirm that the lower estimated number of housing units is the correct one.

Need created by poor housing condition

There are an estimated nearly 4,000 homes in Alaska that are in need of replacement because they are in such poor condition – 43 percent of these housing units are located in the smallest and most remote rural communities.

Table 27: Housing units described as "falling apart," 2008

Community level	% of units falling apart	No. of units falling apart
Anchorage	0.5%	567
Fairbanks	1.5%	551
Other Urban	0.7%	345
Rural 1	1.3%	811
Rural 2	7.2%	1,698
Total		**3,972**

It is worth noting that Rural 1 communities have roughly the same rate of unsalvageable housing stock as urban areas and significantly lower than rural two communities. Creation of new housing stock is most difficult in the most remote parts of the state but perhaps more importantly access and ability to maintain a home once it is in place are also most difficult in very remote communities where both supplies and skilled labor are less available.

Need for major repair

There are more than 23,000 homes in the state that are estimated to be in need of major repair. About half of these homes are in rural Alaska with the other half in urban communities.

Table 28: Housing units in need of major repair, 2008

Community level	% in need of major repair	No. in need of major repair
Anchorage	5.1%	5,670
Fairbanks	8.5%	3,032
Other Urban	6.3%	3,103
Rural 1	9.1%	5,675
Rural 2	25.3%	5,976
Total		**23,456**

The need for major repair is important to pay attention to because it is an indication that a housing unit is on its' way to "falling apart" and becoming unsalvageable.

Need for weatherization

We estimate a need for weatherization services for more than 27,000 homes throughout the state. Just under 44 percent of these housing units are located in rural Alaska with the remaining 56 percent in urban locations.

We estimate that of the 27,000 plus homes that are in need of weatherization services, just under 14,000 of them are *also* financially eligible for the program. It is important to note that this estimate of households that are both in need and eligible for weatherization services is extremely conservative. It is very likely that the actual number is higher than this estimate.

Table 29: Households that cannot maintain 70 degrees Fahrenheit, 2008

Community level	No. of households, 2008 (est.)	Households that cannot maintain 70 deg F, 2008	No. of HH low estimated at 100 percent of median income[9]
Anchorage	112,269	7,958	3,979
Fairbanks	35,652	2,408	1,204
Other urban	49,656	5,214	2,607
Rural 1	62,268	7,009	3,505
Rural 2	23,652	5,150	2,575
Total		**27,739**	**13,870**

[9] The estimated number of houses that are both eligible AND in need of weatherization services is a low end estimate operating on the assumption that 50 percent of households fall at or under median income. It is unknown how many households have income equal to median and would therefore be eligible as well.

Providing weatherization services to the 13,870 housing units estimated to be both eligible and in need of services would be a monumental undertaking that. If we estimate a cost of $11,000 to weatherize all urban housing units in need and $30,000 to weatherize all rural housing units in need the project would require funding of 268,623,200. These costs do not consider the cost of administering the program and again, this is a very conservative estimate of need.

Household Income as Housing Variable

Income is a significant variable when examining any quality of life measure – such as housing – and is an important component for policy makers who are prioritizing distribution of public funds. This section examines housing unit data by income levels. Table 30 shows the distribution of income of survey respondents by the type of community in which they live.

Table 30: Household income by community level

Community level	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Anchorage	11.2%	12.4%	22.2%	27.7%	28.3%	31.5%	31.4%
Fairbanks	8.2%	23.0%	21.8%	27.0%	27.6%	26.0%	23.8%
Other urban	5.5%	14.5%	11.0%	20.0%	13.8%	9.7%	9.7%
Rural 1	20.0%	15.3%	24.4%	22.3%	26.1%	24.9%	22.9%
Rural 2	55.9%	39.2%	24.4%	13.2%	11.0%	9.9%	8.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

The majority of people in the state – more than 80 percent surveyed - live in single family units. Not surprisingly the largest percentage of people living in mobile homes (7.6 percent) are also those with household income less than $20,000 per year.

Table 31 shows housing unit size by income. Average housing unit size increases as income increases. The median size of a housing unit with residents who earn more than $150,000 per year is 2,400 ft^2. At the other end of the income spectrum, the median size of a housing unit with residents who earn under $20,000 per year is 960 square feet.

Table 31: House size by household income, 2008

House size	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Mean (ft^2)	1,095	1,214	1,667	1,760	1,979	1,996	2,523
Median (ft^2)	960	1,100	1,500	1,600	1,800	1,868	2,400
Minimum (ft^2)	150	252	150	300	216	600	400
Maximum (ft^2)	4,000	4,000	6,000	7,200	7,500	5,000	6,000

According to our survey results there is not a strong relationship between income and the average number of people living in each household. The statewide mean

bounced between two and three people per household but not in a way that was related to household income.

Likewise, there does not appear to be a strong relationship between household income and the age of the home. Lower income households are residing in housing units that are on average about five years older than upper income households, and about 2.5 years older than middle income households.

Table 32 shows survey results for the resident's perception of the condition of their home. As would be expected, the income level with the highest percentage of those reported "falling apart" and those "in need of major repair" is the lowest income, less than $20,000 per year.

Table 32: Condition of home by household income, 2008

	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Like new	7.6%	7.2%	11.1%	16.6%	16.0%	20.4%	26.7%
In good shape with normal wear and tear	16.5%	27.8%	32.0%	39.7%	44.3%	42.0%	44.8%
In need of minor repairs	38.2%	39.7%	44.9%	34.6%	32.6%	30.4%	25.7%
In need of major repairs	29.4%	20.6%	9.8%	8.1%	6.4%	5.0%	2.9%
Falling apart	8.2%	4.8%	2.2%	1.0%	0.7%	2.2%	0.0%

Table 33 shows the survey results to three questions related to housing quality and weatherization: (1) When the wind blows does it come through your windows, doors or floors?; (2) Do you get ice build up anywhere on the inside of your house?; and (3) Is there any mold or mildew around the windows of your house? There is a clear correlation between income and these three housing condition variables. The lower the household income the more likely the housing unit is to be insufficiently sealed, leading to drafts, ice buildup, condensation and mold and mildew.

Table 33: Housing quality variables by household income, 2008

	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Draftiness (1)	76.2%	58.9%	49.8%	37.5%	37.8%	38.7%	27.6%
Ice buildup inside house (2)	50.0%	45.7%	31.9%	31.3%	22.7%	29.3%	9.5%
Mold/mildew around windows (3)	38.2%	26.8%	18.6%	18.9%	15.9%	21.0%	8.6%

Similarly the highest percentage of homes with only single-pane windows are those that earn less than $20,000 per year. However, the large majority (more than 70 percent even for the lowest income homes) of housing units statewide and across income lines have double pane windows.

Table 34: Floor temperature by household income, 2008

In winter, floor is…	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Cold	45.0%	26.8%	15.1%	11.5%	11.1%	7.2%	3.8%
Chilly	23.7%	27.8%	25.8%	21.3%	23.2%	22.1%	11.4%
Comfortable	19.5%	33.0%	47.1%	53.0%	51.1%	53.6%	61.0%
Warm	11.8%	12.4%	12.0%	14.2%	14.6%	17.1%	23.8%

Table 35 shows the results of the survey question: "Can you maintain a comfortable temperature in your home during the coldest days in winter?"Most respondents indicated they were able to keep their homes at a comfortable temperature, but again, we can see a clear connection between income and housing condition with nearly a quarter of the lowest income respondents reporting that they were unable to maintain temperature and only 5.8 percent at the other end of the income spectrum. Ability to maintain temperature is as much a function of the condition of the home as it is the income of the resident since if a household has unlimited amounts of money to spend on space heating they can simply keep turning up the heat source without regard to how much is being used.

Table 35: Households that cannot maintain temperature, by income, 2008

Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
24.2%	20.2%	11.2%	9.2%	7.9%	5.6%	5.8%

Low income households are more than twice as likely (9.9 percent) as middle and upper income households to have had their homes weatherized in the last ten years. This makes sense because the program has historically only served households that were at 60 percent of median household income. Presumably those households that do not appear to be eligible for the AHFC weatherization program but report having been served are households that have seen increases in their household income in the last ten years.

There is some variation in primary fuel for space heat by income. However, this is a function of the location of the respondent, how wealth is distributed around the state, and what types of fuels are available in those regions. For example more than 49 percent of households earning $150,000 or more use natural gas for their primary space-heat and only 16 percent of homes with income of less than $20,000 per year use natural gas as their primary heat source. In contrast 65 percent of homes reporting income less than $20,000 per year reported using heating oil as their primary space heating fuel.

Table 36: Primary heating fuel by household income, 2008

Main heating fuel	Under $20,000	$20,000 to $34,999	$35,000 to $49,999	$50,000 to $69,999	$70,000 to $99,999	$100,000 to $149,999	$150,000 or more
Heating oil	65.1%	65.2%	51.8%	48.5%	47.0%	45.9%	45.7%
Natural gas	16.0%	20.3%	34.4%	39.7%	40.3%	44.2%	49.5%
Electricity	2.4%	2.9%	2.2%	1.7%	3.2%	4.4%	1.9%
Wood	16.0%	9.2%	10.7%	9.2%	7.1%	3.9%	1.9%
Other	0.6%	2.4%	0.9%	1.0%	2.5%	1.7%	1.0%

Cost of Construction

Cost of construction, like the price of fuel, can vary wildly from location to location and from year to year, even within the same geographic region of the state. This section of the report provides a picture of the costs to build a house during the last building season and outlines some of the issues that impact residential construction in Alaska. In particular we examine the impact of transportation costs and the impact of regulations that govern the operations of regional housing authorities.

The prohibitively high cost of construction coupled with limited economic opportunity create substantial barriers to residential housing development in many rural communities in Alaska. In many of these communities there is little or no activity in what would be viewed as a traditional housing market. Shipping costs make home construction significantly more expensive in rural communities, particularly those that are off the road and marine highway systems.

One consistent measure of the transportation costs associated with construction materials is the AHFC Construction Cost survey produced by the Alaska Department of Labor and Workforce development annually for 16 years. The survey collects prices for a market basket of goods used to build a home from area contractors; these goods represent roughly 30 percent of the total cost associated with the materials used to build a new home. There is some variation in the types of goods in a local market basket to reflect the different types of housing in different parts of the state. For example no foundation materials would be included in an area where homes are built on pilings and metal roofs are used widely in rural Alaska but almost never in Anchorage.

The Construction Cost survey samples 11 communities. The sample includes urban communities, those on the road system and/or the marine highway system and rural hub villages from around the state but does not include any small rural communities for whom transportation costs are even more significant.

Using information provided in the cost of construction survey it is possible to create a transportation index. By setting Anchorage to one we can estimate the expense associated with shipping materials to various parts of the state. One added cost that this methodology does not consider is the additional costs associated with skilled labor in communities where none exists. Flying a plumber in to a remote site to plumb a housing unit is far more expensive than calling a local plumber to do the job.

Table 37 shows the transportation costs associated with purchasing a market basket of residential housing construction materials from Seattle to the listed destinations. An index is created from this information with Anchorage set to 1.0. To estimate cost of construction in any of these communities outside Anchorage the average cost to build a home in Anchorage is multiplied by the index value for the chosen community.

New construction permits for the Municipality of Anchorage in 2008 give the following average cost of construction for new residential units.

- $345,437 per single family unit
- $203,708 per multiple family unit

Table 37: Costs to ship construction materials from Seattle for sample Alaska destinations

Destination	Census area	Cost to ship from Seattle	Index (Anchorage = 1.0)
Ketchikan	Ketchikan Gateway	$2,549	0.38
Juneau	Juneau Borough	$3,944	0.58
Sitka	Sitka Borough	$6,472	0.95
Anchorage	Anchorage Municipality	$6,782	1.00
Wasilla	Mat-Su Borough	$7,441	1.10
Kenai	Kenai Peninsula Borough	$8,626	1.27
Fairbanks	Fairbanks North Star Borough	$8,793	1.30
Kodiak	Kodiak Island Borough	$9,609	1.42
Bethel	Bethel CA	$12,047	1.78
Nome	Nome CA	$14,927	2.20
Barrow	North Slope Borough	$20,289	2.99

It is important to note that the sample in the table above does not include any small rural communities where transportation costs are often even higher than rural hub communities like Bethel, Nome and Barrow. In many very small remote communities the only builder of new housing units is the area's regional housing authority.

The project team gathered actual cost of construction information from Alaska regional housing authorities for years 2005 through 2008. Housing authorities built new housing in all parts of the state, including urban and rural communities. Housing authorities reported building primarily single family homes during this time with a healthy number of multiple family units and purchasing minimal mobile homes. For rural areas in Alaska the regional housing authorities build (or contract out to build) the vast majority of new housing units and so their costs are a good measure of average costs for the area.

Regional housing authorities receive federal funds to provide housing and/or access to home loans for low income Alaska Native people. Alaska's regional housing authorities have been so successful in leveraging the federal money they receive with other revenue streams that several of them are also able to provide services to low income non-Native people in many parts of the state, most notably in

Anchorage. Regional housing authorities construct housing units in some of the most challenging conditions in the country, operating in extreme weather, with limited infrastructure and a heavy administrative burden associated with regulatory requirements that come with state and federal government funds.

Many of the unique challenges that regional housing authorities face are related to the locations in which they are building. The high cost of any project development in rural Alaska is well established. There are however, other requirements that impact both urban and rural development, some of these requirements are listed below.

- The Native American Housing and Self Determination Act (NAHASDA) which governs federal funds received by housing authorities requires that they pay Davis Bacon wage rates for all projects. Davis Bacon wages are often considerably higher than a private sector contractor would have to pay for similar work. NAHASDA also required extensive environmental site review.
- The Alaska Housing Finance Corporation (AHFC) supplemental grant fund which provides energy efficiency dollars to supplement housing authority projects requires that all homes meet the Built Energy Efficiency Standard (BEES). While most regional housing authorities are already building energy efficient homes and would continue to do so, there are additional costs associated with inspections that are required for BEES certification. There is currently no statewide building energy code so private builders do not have to comply with BEES or any other building energy standard.
- HUD Section 3 requirement that projects *"to the greatest extent possible, provide job training, employment, and contract opportunities for low- or very-low income residents in connection with projects and activities in their neighborhoods."* Many housing authorities use force account labor to increase the level of resident hire on projects.

The result of these requirements, and others, is higher administrative and labor costs and more energy efficient (but also more expensive) housing units.

Table 38 provides examples of the actual costs associated with building new single family housing units in remote rural communities. Each of the examples below represents real projects completed in the past two years. Note that there are no costs associated with land, which is usually donated, or with construction financing; two significant costs in traditional home building. Other cost categories appear much larger for housing authorities including infrastructure, freight and developer fees. In one of the examples below infrastructure costs account for 23 percent of total project cost and freight costs range from 10 to nearly 17 percent of total project cost.

Table 38: RHA single family construction costs, selected projects

Location	Chefornak	Marshall	Nelson Lagoon[10]	Shaktoolik	Alatna
Building Type	Single Family	Single Family	Single Family	Single Family	Single Family
Total Units	1	1	1	4	1
Total Bedrooms	2	3	3	13	3
Cost Information					
Land	$0	$0	$0	$0	$0
Infrastructure[11]	$2,793	$93,250	$5,199	$100,000	$10,000
Freight	$30,652	$34,710	$51,941	$126,205	$70,000
Construction Permits	$0	$0	$0	$1,000	$0
Hard Costs[12]	$172,817	$180,039	$439,867	$872,686	$324,000
Soft Costs[13]	$5,150	$5,150	$28,126	$50,000	$10,000
Construction Financing	$0	$0	$0	$0	$0
Permanent Financing	$0	$0	$0	$0	$0
Developer Fees/Costs[14]	$63,599	$90,397	$20,967	$20,000	20%
Total Cost of Project	**$275,011**	**$403,546**	**$546,100**	**$1,169,891**	**$414,000**

Notes:

[10] Note that this home was built with State Davis Bacon wage requirements, substantially increasing labor costs (found in hard costs), also note that freight costs were shared with another housing unit built at the same time, lowering per unit freight costs.

[11] Infrastructure includes, water, sewer, extending utility connection, roads, etc.

[12] Hard costs include labor, materials, etc

[13] Soft costs include design, inspections, surveys, soils/environmental reports

[14] Developer fees include Housing Authority admin

Table 39 on provides further analysis of the projects described in Table 38 to table above. It is important to remember that most housing units built in rural Alaska are much smaller than homes built in urban areas. The housing units described in these tables range in size from 624 to 1,500 square feet. Other differences appear from region to region include type of building materials used and complexity of design. For example, in the Calista region where transportation costs are extremely high and ability to quickly address building maintenance issues is limited, most homes have internal siding instead of drywall and a single monitor heater instead of more complex heating systems that are typical in urban homes.

Table 39: RHA single family selected project cost analysis

Location of project	Chefornak	Marshall	Nelson	Shaktoolik	Alatna
Total cost of project	$275,011	$403,546	$546,100	$1,169,891	$414,000
Cost per bedroom	$137,506	$134,515	$182,033	$89,992	$138,000
Cost per square foot	$441	$360	$442	$245	$316
Cost Per unit	$275,011	$403,546	$546,100	$292,473	$414,000

Figure 8 shows the cost per square foot for several different single family homes built throughout the state. Some communities have multiple examples represented, e.g. Marshall, while others have only one example represented. The homes below range in size from 624 square feet in Chefornak to 1,504 in Nelson Lagoon. Cost of construction per square foot ranges from $189 in Sitka to $501 in Shageluk.

Figure 8: Single-family house construction cost per square foot

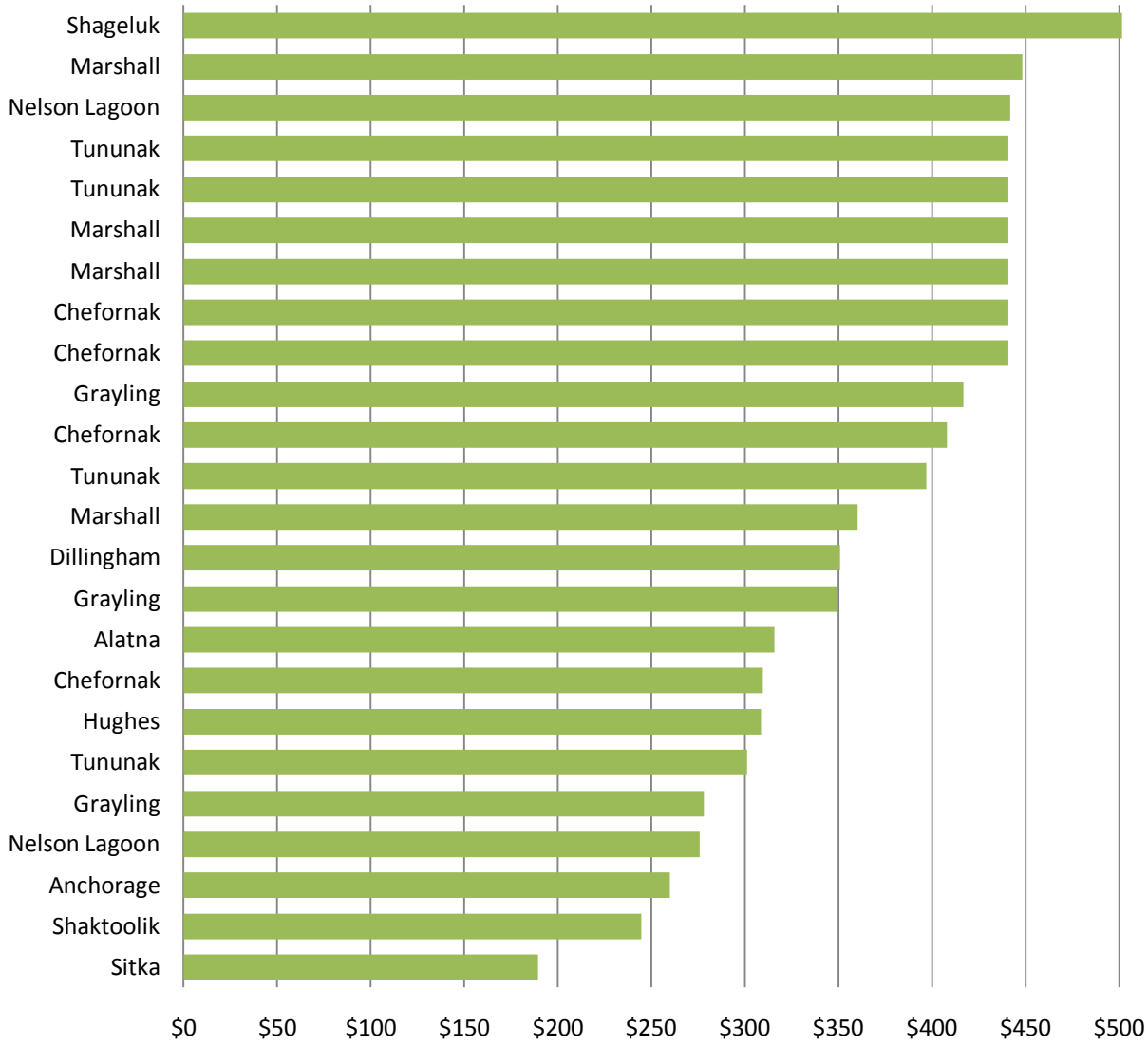


Table 40 shows the costs associated with two multi-family projects; one in Hooper Bay and one in Anchorage. The project in Hooper Bay was built for families and includes 2, 3, 4, and 5 bedroom units. The Anchorage project is senior housing. These two projects, while different, provide examples of the types of costs incurred by housing authorities building multi-family housing projects.

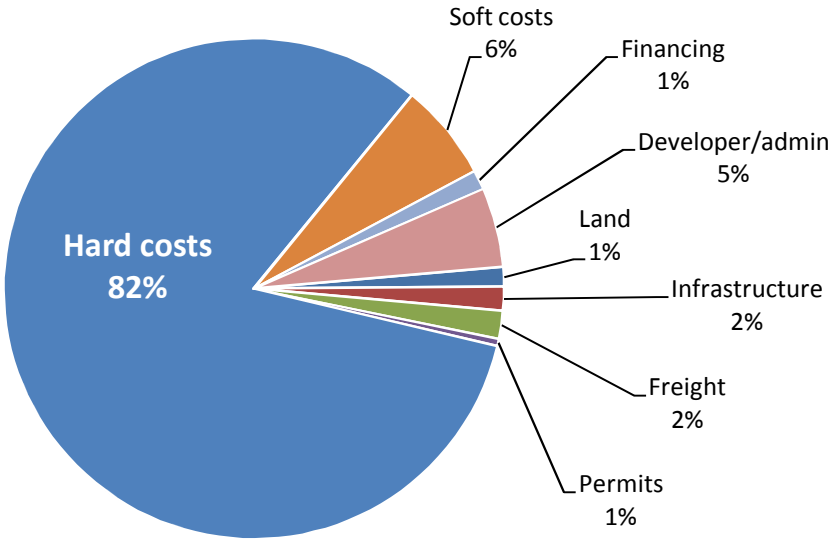
Table 40: RHA multi-family housing project construction costs, Two examples

Location	Hooper Bay	Anchorage
Building type	Multi-Family	Multi-Family
Total units	19	59
Total bedrooms	65	72
Total living area all units: sq ft	27,070	91,693
Average living area per unit sq ft	1,425	1,554
Cost Information		
Land	$0	$0
Infrastructure	$0	$46,956
Freight	$1,200,000	$0
Location	**Hooper Bay**	**Anchorage**
Construction Permits	$5,470	$128,265
Hard Costs	$8,851,661	$19,769,648
Soft Costs	$1,373,589	$1,490,086
Construction Financing	$0	$308,480
Permanent Financing	$3,276	$94,534
Total Cost of Project	**$12,126,758**	**$22,837,969**
Total Cost Per Square Foot	$448	$249
Total Cost Per Unit	$638,250	$387,084

Figure 9 on page 63 shows the percentage of total cost associated with a variety of construction variables for several rural and urban housing projects completed by regional housing authorities over the last two years. The number of units is not large enough to be a representative sample of regional housing authority construction but it does provide a picture of how construction costs are allocated.

The costs associated with building in Alaska are explored in this section because they are so varied and are an important variable in the housing equation. However, estimating a total cost of replacing all substandard housing units and building to alleviate overcrowded conditions is an unnecessary and misleading effort. It is not possible that all of the housing needed to alleviate overcrowding and substandard housing will occur in one building season or even in ten. Even if the funding were available to build all of the needed units, it would take considerable time to get the job done. For this reason an estimate of gross cost is not terribly meaningful.

Figure 9: Regional housing authority construction cost allocation



Population Dynamics

Alaska's Population: 2000-2008

Alaska has a population of 686,300, ranking it 47th among the nation's 50 states.[10] The state's population has been growing at about 1.0 percent a year since 2000, due primarily to natural increase (births minus deaths) rather than migration.[11] The state has grown at almost the same rate as the United States population as a whole, which experienced an eight percent increase from 2000 to 2008.

Alaska's population is concentrated in its urban road/railbelt areas, especially in the Municipality of Anchorage (41 percent) and Matanuska-Susitna Borough (12 percent). Currently over half (53 percent) of Alaskans live in the greater Anchorage/Mat-Su region. That proportion has been growing. In 2000, the region accounted for 51 percent of the state's population.

Other predominantly urban boroughs account for another quarter of Alaska's population: Fairbanks North Star Borough (14 percent), Kenai Peninsula Borough (8 percent) and the city and borough of Juneau (4 percent). In all 458,000 (67 percent) Alaskans live in the communities designated as Urban in this study.

WHERE THE GROWTH IS

The fastest growing area of the state continues to be the Mat-Su Borough, which has grown at an average rate of four percent per year since 2000, continuing the rapid pace of growth the borough saw throughout the 1990s. Three-quarters of the growth in Mat-Su has been from migration. Mat-Su is one of only 10 of Alaska's 29 boroughs and census areas that gained population since the 2000 U.S. census: Municipality of Anchorage (+24,700 people), Mat-Su Borough (+23,200), Fairbanks

[10] The U.S. Census Bureau estimates Alaska's 2008 population at 686,293. The Alaska Department of Labor and Workforce Development (DOLWD) uses a lower estimate of 679,720. The difference is due primarily to differing estimates for the population of the Fairbanks North Star Borough. The FNSB population was revised upward by the Census Bureau following the borough's successful 2007 challenge to the state's municipal population estimate. On June 1, 2009, the Alaska Department of Commerce, Community and Economic Development (DCCED) certified FNSB population at 97,970; however Alaska DOLWD still uses a lower estimate of 89,896 in calculations of Alaska economic and demographic statistics and trends.

[11] About 90,000 people migrate to or from Alaska each year, but in- and out- migration have been nearly equal in recent years. Between 2007 and 2008 approximately 2,500 more people left than entered the state. Since 2000, the state has lost a total of 6,000 residents through net migration, while gaining nearly 60,000 through natural increase.

North Star Borough (+15,150), Kenai Peninsula Borough (+3,300), Bethel Census Area (+900), Southeast Fairbanks Census Area (+850), and Wade Hampton Census Area (+650).[12]

Figure 10: Alaska population by borough and census area, 2008 estimate

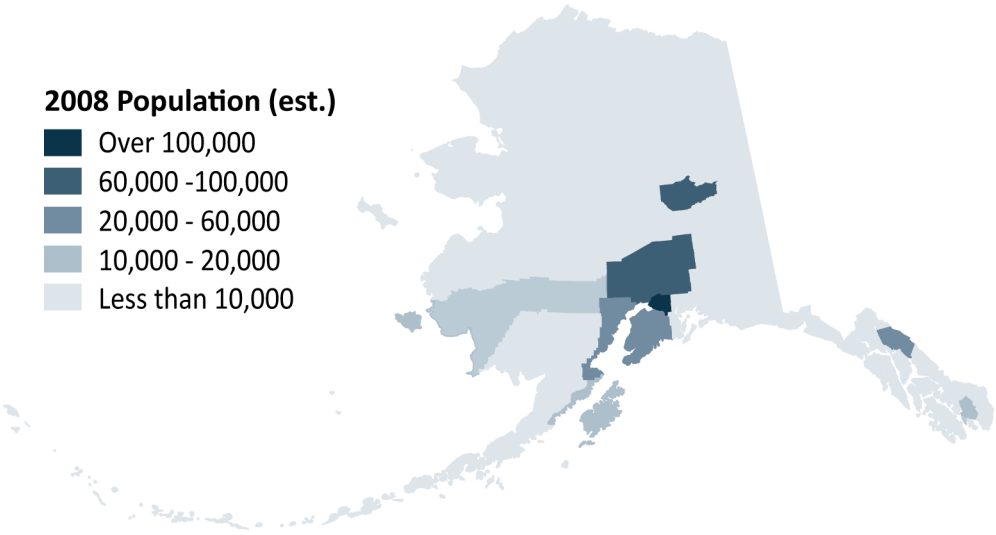
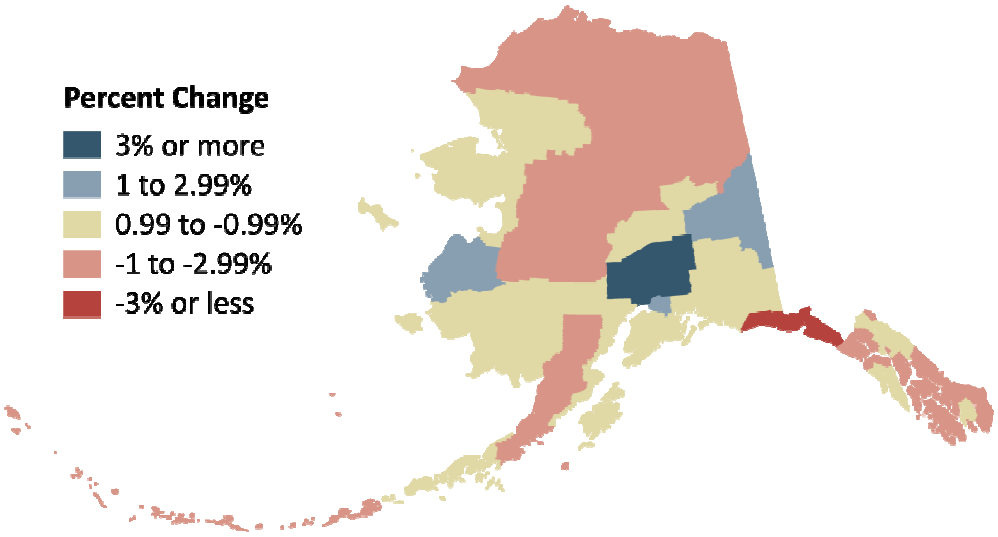


Figure 11: Average annual change in regional population, 2000-2008



Data source: Alaska DOLWD, Research and Analysis Section, Demographics Unit.

[12] Except for the Fairbanks North Star Borough, all figures represent the difference between the 2000 U.S. Census and the 2008 Alaska DOLWD population estimate. Fairbanks' growth is calculated using the 2008 U.S. Census estimate for the borough. Numbers have been rounded.

DECLINING POPULATIONS

Southeast Alaska has seen its population decline faster than other regions of the state, and this trend is projected to continue, according to DOLWD.[13] Overall the Southeast region lost 8,000 people to net out-migration between 2000 and 2008; with an aging population, these losses were only partially offset by new births. The population of the region as a whole declined by 3,880 people (+5.3 percent) since 2000, and no community saw long-term population growth over this period. Nearly a third of the region's decline was in the Ketchikan Gateway Borough, which saw its population drop by 1,066 (+7.6 percent) during the period.

In the Southwest, while Bethel and the Wade Hampton Census Areas gained population, the Aleutians West Census Area saw its population decline by over 1,000 (-30.1 percent). Sharp declines were also experienced in Bristol Bay Borough (229 people, -28.6 percent) and the Lake and Peninsula Borough (271 people, +21.2 percent). The Dillingham Census Area lost 151 residents (-3.3 percent) since 2000. Population was flat for Aleutians East Borough (+0.1 percent) and the region as a whole (-0.4 percent).

In the Gulf Coast region, the Kodiak Island Borough's population declined by 540 people (-3.9 percent), and Valdez/Cordova Census Area lost more than 650 residents (-6.7 percent) between 2000 and 2008. The 6.6 percent growth in the Kenai Peninsula Borough was due primarily to new births. Net migration accounted for less than 600 (17.6%) of the borough's new residents.

In the Northern region, the North Slope Borough lost nearly 700 residents (-9.2 percent) from 2000 to 2008, while Nome and the Northwest Arctic Borough saw modest overall population gains (+3.3 percent and +2.8 percent respectively) from natural increase outpacing out-migration.[14]

In Interior Alaska, population in the Yukon-Koyukuk Census Area declined by over 800 people (-14.8 percent) as out-migration exceeded gains from natural increase. Population in the Denali Borough has held nearly steady since 2000 with a net loss of just 45 people (-2.4 percent).

[13] Alaska population estimates and projections published by the department's Research and Analysis Section form the basis for much of the information in this chapter, especially the May 2009 issue of Alaska Economic Trends, ("Alaska's 2008 Population," 13), and the October 2007 issue ("Population Projections: 2007-2030," 4).

[14] The Mat-Su Borough, Kenai Peninsula Borough and Southeast Fairbanks Census Areas were the only areas of the state with more in-migration than out-migration between 2000 and 2008. All other boroughs and census areas in the state lost more people than they gained through net migration, according to Alaska DOLWD. Other areas of the state which gained population since 2000 did so by having natural increases (births minus deaths) that more than offset their out-migration.

Table 41: Alaska population by economic region, borough and census area, 2000-08

Region or Area	2000 Census (Apr 1, 2000)	2008 Estimate (July 1, 2008)	Natural Increase (Births-Deaths) 4/1/00-06/30/08	Net Migration (In-Out) 4/1/00-06/30/08	Rate of Change Total Change 2000-2008	Rate of Change Annual Average 2000-2008
Alaska (1)	**626,931**	**679,720**	**59,828**	**-7,039**	**8.4%**	1.0
Anchorage/Mat-Su	**319,605**	**367,509**	**31,139**	**16,765**	**15.0%**	**1.7**
Anchorage, Municipality of	260,283	284,994	25,578	-867	9.5%	1.1
Matanuska-Susitna Borough	59,322	82,515	5,561	17,632	39.1%	4.0
Gulf Coast Region	**73,799**	**75,876**	**4,656**	**-2,579**	**2.8%**	**0.3**
Kenai Peninsula Borough	49,691	52,990	2,717	582	6.6%	0.8
Kodiak Island Borough	13,913	13,373	1,314	-1,854	-3.9%	-0.5
Valdez-Cordova Census Area	10,195	9,513	625	-1,307	-6.7%	-0.8
Interior Region	**97,417**	**104,421**	**11,204**	**-4,200**	**6.7%**	**0.8**
Denali Borough	1,893	1,848	127	-172	-2.4%	-0.3
Fairbanks North Star Borough (2)	82,840	97,970	–	–	18.3%	–
Southeast Fairbanks Census Area	6,174	7,008	527	307	11.9%	1.5
Yukon Koyukuk Census Area	6,510	5,669	305	-1,146	-14.8%	-1.7
Northern Region	**23,789**	**23,612**	**3,508**	**-3,685**	**-0.7%**	**-0.1**
Nome Census Area	9,196	9,499	1,285	-982	3.3%	0.4
North Slope Borough	7,385	6,706	1,098	-1,777	-9.2%	-1.2
Northwest Arctic Borough	7,208	7,407	1,125	-926	2.8%	0.3
Southeast Region	**73,082**	**69,202**	**4,099**	**-7,979**	**-5.3%**	**-0.7**
Haines Borough	2,392	2,310	34	-116	-3.4%	-0.4
Juneau City and Borough	30,711	30,427	2,070	-2,354	-0.9%	-0.1
Ketchikan Gateway Borough (3)	14,059	12,993	778	-1,844	-7.6%	-1.0
Prince of Wales-Outer Ketchikan C.A. (4)	6,157	5,360	338	-1,135	-12.9%	-1.7
Sitka City and Borough	8,835	8,615	556	-776	-2.5%	-0.3
Skagway-Hoonah-Angoon C.A.	3,436	2,946	129	-619	-14.3%	-1.9
Hoonah-Angoon Census Area	2,574	2100	–	–	-18.4%	-2.5
Skagway Municipality	862	846	–	–	-1.9%	-0.2
Wrangell-Petersburg Census Area	–	–	166	-891	–	-1.4
Petersburg Census Area	4,260	3,847	–	–	-9.7%	-1.2
Wrangell City and Borough (5)	2,448	2,112	–	–	-13.7%	-1.8
Yakutat City and Borough	808	592	28	-244	-26.7%	-3.7
Southwest Region	**38,961**	**39,100**	**5,222**	**-5,361**	-0.4%	**0.0**
Aleutians East Borough	2,701	2,699	102	-100	0.1%	0.0
Aleutians West Census Area	3,413	4,439	216	-1,242	-30.1%	-2.5
Bethel Census Area	17,834	16,940	2,766	-1,872	5.0%	0.7
Bristol Bay Borough	800	1,029	61	-290	-28.6%	-2.4
Dillingham Census Area	4,620	4,771	522	-673	-3.3%	-0.4
Lake and Peninsula Borough	1,281	1,552	93	-364	-21.2%	-1.9
Wade Hampton Census Area	8,312	7,670	1,462	-820	7.7%	1.1

Sources: US Census 2000, 1990; Alaska DOLWD, Research and Analysis Section, Demographics Unit.

Notes: (1) The U.S. Census Bureau estimates Alaska's 2008 population at 686,293. (2) The 2008 estimate for the Fairbanks North Star Borough comes from the U.S. Census Bureau. (3) 2000 population for the Ketchikan Gateway Borough does not include annexed population of Outer Ketchikan. (4) Renamed Prince of Wales-Hyder Census Area in 2008. (5) 2000 population reflects the incorporated area, which is greater than the 2000 Census Area Population.

Table 42: Population change in Alaska places with more than 2,000 people, 2000-2008

	2008 estimate (Jul 1, 2008)	2000 census (Apr 1, 2000)	Population Change	Average Annual Change
Knik-Fairview CDP	12,989	7,049	5,940	7.2%
Fishhook CDP	3,230	2,030	1,200	5.5%
Meadow Lakes CDP	7,106	4,819	2,287	4.7%
Tanaina CDP	7,218	4,993	2,225	4.4%
Deltana CDP	2,233	1,570	663	4.2%
Homer city	5,390	3,946	1,444	3.8%
Gateway CDP	3,996	2,952	1,044	3.6%
North Pole city	2,099	1,570	529	3.5%
Wasilla city	7,176	5,469	1,707	3.3%
Willow CDP	2,142	1,658	484	3.1%
Butte CDP	3,262	2,561	701	2.9%
Kalifornsky CDP	7,312	5,846	1,466	2.7%
Lakes CDP	8,249	6,706	1,543	2.5%
Palmer city	5,559	4,533	1,026	2.5%
Big Lake CDP	3,191	2,635	556	2.3%
Anchorage municipality	284,994	260,283	24,711	1.1%
College CDP	12,456	11,402	1,054	1.1%
Sterling CDP	5,134	4,705	429	1.1%
Soldotna city	4,061	3,759	302	0.9%
Bethel city*	5,665	5,471	194	0.4%
Kenai city	7,134	6,942	192	0.3%
Nikiski CDP	4,406	4,327	79	0.2%
Nome city	3,570	3,505	65	0.2%
Kotzebue city*	3,126	3,082	44	0.2%
Fairbanks city	30,367	30,224	143	0.1%
Juneau city and borough	30,427	30,711	-284	-0.1%
Sitka city and borough	8,615	8,835	-220	-0.3%
Dillingham city*	2,347	2,466	-119	-0.6%
Ketchikan city	7,508	7,922	-414	-0.7%
Kodiak city	5,974	6,334	-360	-0.7%
Petersburg city	3,009	3,224	-215	-0.8%
Seward city	2,619	2,830	-211	-0.9%
Valdez city	3,635	4,036	-401	-1.3%
Barrow city*	4,054	4,581	-527	-1.5%
Cordova city	2,161	2,454	-293	-1.5%
Wrangell city and borough	2,112	2448	-336	-1.8%
Unalaska city*	3,551	4,283	-732	-2.3%

* Alaska Native Statistical Area

Sources: US Census 2000; Alaska DOLWD Research and Analysis Section, Demographics Unit.

Notes: (1) CDP is an abbreviation for Census Designated Place. (2) The July 1, 2008, estimates represent the annual average population for the year, not the population on July 1. Seasonal populations may be higher than the average annual population shown. (3) Homer, Ketchikan, Palmer, Wasilla, and Wrangell gained population through annexation between 2000 and 2008.

CHANGES AT THE COMMUNITY-LEVEL

Not surprisingly, 11 of the 15 fastest-growing places in Alaska are in Mat-Su, according to DOLWD. The Knik-Fairview Census Designated Place (CDP), which has grown at an average of 7.2 percent per year since 2000, would become the state's fourth-largest city if it incorporated. Other especially fast-growing Mat-Su communities include: Fishhook CDP (+5.5 percent), Meadow Lakes (+4.7 percent), Tanaina (+4.4 percent), Wasilla (+3.3 percent), Willow (+3.1 percent), and Butte (+2.9 percent). Numbers in parentheses are the communities' average annual growth rates from April 1, 2000, to June 20, 2008. The community's overall population change for the period will be approximately eight times the annual average.

Only four communities in other parts of the state have been gaining population at rates over two percent per year. In the Interior, Deltana grew at 4.2 percent per year between 2000 and 2008, while the City of North Pole grew at 3.5 percent. On the Kenai Peninsula, Homer's population grew at 3.8 percent per year since 2000, and Kalifornsky has experienced average annual growth of 2.7 percent.

The majority of Alaska communities (56 percent) have had flat or declining populations in recent years. This includes Unalaska (City, -2.3 percent), Wrangell (City and Borough, -1.8 percent), Cordova (City including Eyak, -1.5 percent), Barrow (City, -1.5 percent), Valdez (City, -1.3 percent), Ketchikan (City, -0.7 percent), Sitka (City and Borough, -0.3 percent), and Juneau (City and Borough, -0.1 percent). Table 42 shows recent population changes for all census designated places in Alaska with populations greater than 2,000.

Population Projections, 2010-2030

Alaska's population is projected to grow 25 percent from 670,000 in 2006 to over 838,000 in 2030. This growth model is based on a relatively stable level of net migration to and from Alaska, consistent with the state's experience over the last two decades. Alaska DOLWD projected future population growth in 2007 through the year 2030 for the state as a whole, for each economic region, borough and census area, and for Alaska's Native American population. (Alaska DOLWD, 2007)[15]

State demographers caution that there is a great deal of uncertainty about what actual rates of growth will be. The greatest uncertainty comes from trying to predict migration trends. Alaska's history is marked by transforming events like the gold rush, the construction of the Trans-Alaska Pipeline System (TAPS), and the oil boom

[15] To arrive at their projections, researchers used a "cohort component" method to project population changes for each sex by age group and then applied a large number of differing assumptions to each group to model the probable impacts of migration and fertility on the population. Their methodology and conclusions are published in Alaska DOLWD, *Alaska Population Projections: 2007-2030*. (Juneau, July 2007), which is the basis for much of the information in this section. Accessed online at http://laborstats.alaska.gov/?PAGEID=67&SUBID=163.

which followed it, which dramatically increased migration to Alaska. In recent years, however, out-migration has exceeded in-migration.

It is considered unlikely that any events over the next 20 to 25 years will produce large-scale population changes in Alaska due to net migration, but state demographers do not rule them out. The population shocks from construction of a natural gas pipeline are not expected to be on the scale Alaska experienced with TAPS.[16] In real dollar terms, the Alaska portion of a gas pipeline project will be considerably smaller than TAPS, and Alaska is better equipped to provide the labor, expertise and public infrastructure a large pipeline project will require than it was in 1974. While Alaska's population has grown, the state's economy and workforce have become larger and more diversified. State demographers believe that as Alaska develops, both in- and out-migration levels will become less prone to dramatic shifts.

The state could still see greater population influxes than predicted if several large infrastructure projects occur simultaneously, increasing the demand for specialized labor. Even without such a "perfect storm," speculative migration may increase if a mega project fuels robust economic growth in Alaska at the same time that other areas of the country are in recession, as was the case during TAPS construction.

AGING OF ALASKA'S POPULATION

Alaska's senior population has historically been small, but with the aging of the "baby boom" generation Alaska's population age 65 and over will grow substantially over the next 20 years, mirroring the trend in the rest of the country. The state's population projections anticipate the number of older Alaskans will nearly triple in size from 45,500 in 2006 to 134,400 by 2030. Alaskans in this age group are expected to increase from seven percent of the population to 16 percent, which will increase demand for the whole range of senior housing options. Projected growth for other age groups is shown in Table 43.

Table 43: Population projections by age, 2010-2030

Age group	2006 estimate	2030 projection	2006 % of Pop.	2030 % of pop.	% Change 2006-2030
0 – 4 (1)	53,456	64,425	8.0%	7.7%	21%
5 - 13	95,048	118,624	14.2%	14.1%	25%
14 - 17	46,243	51,320	6.9%	6.1%	11%
18 - 64	429,817	469,916	64.1%	56.0%	9%
65+	45,489	134,391	6.8%	16.0%	195%

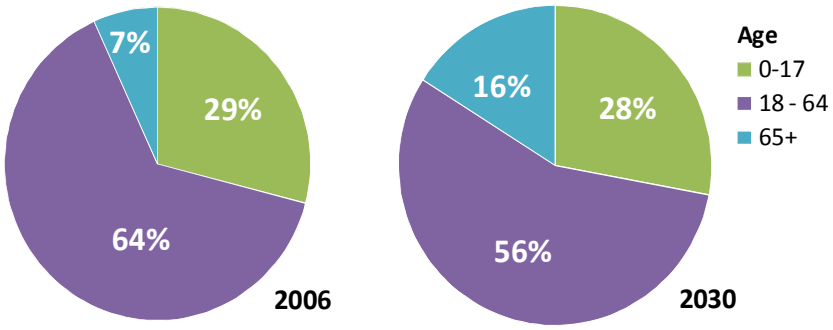
Source: Alaska DOLWD Research and Analysis Section, Demographics Unit.

Notes: (1) There is a high degree of uncertainty in projections for younger age group, especially those not yet born.

[16] Information Insights, *Stranded Gas Development Act Municipal Impact Analysis.* (Fairbanks, November 2004), 25.

Because of these changing age demographics, the burden on Alaska's working-age population to support the growing number of elderly Alaskans will increase. Whereas every 100 Alaskans of working age (ages 18 to 64) supported 10.6 persons over the age of 64 in 2006, by 2030 the same number of Alaskans may need to support up to 27.9 people over age 64.

Figure 12: Alaska population aged 18-64 compared with youth and elderly, 2006 and 2030.



ALASKA NATIVE POPULATION PROJECTIONS

Alaska Natives and other Native Americans living in the state are projected to grow slightly as a share of the state's population, from 17.7 percent in 2006 to 19.4 percent by 2030. The proportion of Alaska Natives aged 65 or over will also grow from six percent to 12 percent of the overall Native population.

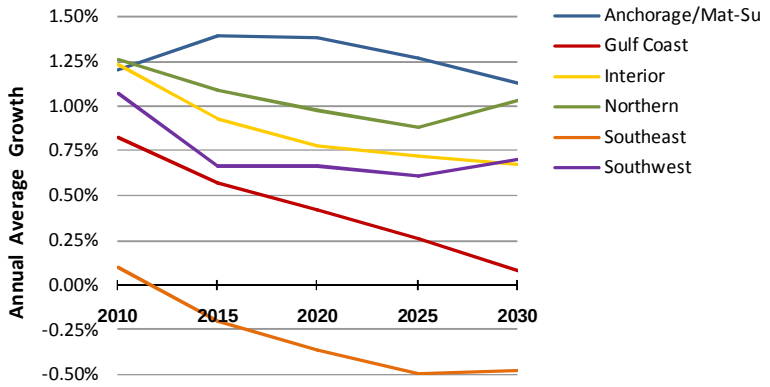
As the Alaska Native population ages and as more Alaska Natives move into urban areas, the fertility rate among Alaska Natives (the average number of children per woman), which is one of the highest in the country, is expected to decline somewhat (from 3.2 to 3.0), resulting in slightly smaller family sizes.

Total fertility rates in Alaska vary greatly from region to region, from a high of 4.73 in the Wade Hampton Census Area in Western Alaska to a low of 1.74 in Haines Borough. Fertility (and thus household size) is generally lower in urban Alaska. Birth rates are lowest in the Aleutians, where large numbers of people involved in fishing and fish processing live in group quarters.

REGIONAL POPULATION CHANGES

Looking forward, population growth in the Anchorage/Mat-Su region is expected to continue to outpace growth in other regions of the state, while the only region expected to lose population is Southeast Alaska. Figure 13 shows the projected rate of population growth or decline for different areas of the state over the next 20 years.

Figure 13: Projected Alaska population growth rate by region, 2010-2030



Data source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

Demographers warn that there is a great deal of uncertainty regarding population changes for specific regions, especially regions with small populations. Inter-regional migration is subject to highly specific economic factors, historic events and policy initiatives which can dramatically influence population movement. DOLWD population projections for Alaska's boroughs and census areas, shown on page 75 should not be regarded as inevitable.

FACTORS BEHIND RURAL OUT-MIGRATION

There is concern among many in Alaska that the dramatic increase in energy costs over the past two years may be greatly accelerating the state's historical trend of rural to urban migration.

A May 2008 study by the Institute of Social and Economic Research (ISER) at the University of Alaska Anchorage found that net out-migration from rural areas of the state had more than doubled to 2,700 people annually for 2006-2007 compared with 1,200 annually in the three previous years.(Martin, Killorin, & Colt, May 2008). The authors conclude that it is too soon to tell whether this represents a statistical "blip" or a significant acceleration in outmigration, especially since many Alaska Natives move back and forth several times over their lifetimes.

Surveys show that in many cases people looking for more job opportunities initially move to hub communities such as Nome, Bethel or Barrow within their own cultural region, before moving to an urban area such as Anchorage, Fairbanks, or Juneau. The U.S. Census does not publish statistics on migration within regions (e.g. moving from a village to a regional hub) so this first step in rural out-migration is not included in statistics on net migration.

A 2003 ISER survey of Alaska Natives in the North Slope, Northwest Arctic, and Bering Straits regions found that people in middle income groups are most likely to leave their communities, since people with the lowest incomes cannot afford to move and there is less incentive for people with high incomes to move. For this

reason, the people hardest hit by high fuel costs may be the least able to afford to move.[17]

This may be one reason that, as of 2007, fuel prices did not seem to be the driving force behind decisions to move out of rural communities, though the high cost of living in villages was considered a problem by village residents. There is not sufficient data to show whether the increases in fuel prices since 2007 have been a primary factor behind more recent increases in migration.

There does not appear to be a single, simple reason behind out-migration. Even in the North Slope Borough, which has fuel subsidies and high paying jobs that allow for subsistence activities, the rate of out-migration has been high.

Lack of housing may affect migration. A 1986 study by ISER found that people are more likely to leave communities with overcrowded housing and are not likely to return if they don't believe they can find a decent place to live.

Previous studies have found that more Alaska Native women are leaving villages than men. Since relatively high birth rates have been responsible for much of Alaska's rural population growth – offsetting losses from migration – the fact that more women are moving has implications for the future viability of small rural communities. For 18 of Alaska's smallest communities (those with populations under 100) there were zero women aged 20-29 at the time of the 2000 census. Another 23 communities reported only one woman in that age group.

Communities under 100 have historically been the most vulnerable to decline. Even in regions where population is declining, some larger communities continue to grow. Men who prefer to stay in rural Alaska cite hunting and fishing as major reasons. Women are more likely to stay for family reasons.

[17] Martin, S., Killorin, M., & Colt, S. (May 2008). *Fuel Costs, Migration, and Community Viability.* Anchorage: Institute of Social and Economic Research.

Table 44: Projected Alaska population by region, 2010-2030

	2006	2010	2015	2020	2025	2030
Anchorage/Mat-Su Region	**359,987**	**377,651**	**404,745**	**433,588**	**462,005**	**488,553**
Municipality of Anchorage	282,813	293,323	306,902	322,087	337,706	350,871
Matanuska-Susitna Borough	77,174	84,328	97,843	111,501	124,299	137,682
Gulf Coast Region	**74,611**	**77,107**	**79,279**	**80,920**	**81,951**	**82,286**
Kenai Peninsula Borough	51,350	53,607	55,951	57,883	59,339	60,268
Kodiak Island Borough	13,506	13,477	13,298	13,058	12,740	12,255
Valdez-Cordova Census Area	9,755	10,023	10,030	9,979	9,872	9,763
Interior Region	**102,276**	**107,416**	**112,525**	**117,026**	**121,291**	**125,422**
Denali Borough	1,795	1,786	1,739	1,676	1,601	1,536
Fairbanks North Star Borough	87,849	92,868	97,706	101,973	106,106	110,131
Southeast Fairbanks Census Area	6,772	6,863	7,314	7,782	8,222	8,644
Yukon-Koyukuk Census Area	5,860	5,899	5,766	5,595	5,362	5,111
Northern Region	**23,676**	**24,904**	**26,299**	**27,607**	**28,854**	**30,372**
Nome Census Area	9,535	9,902	10,412	10,908	11,405	12,024
North Slope Borough	6,807	7,291	7,722	8,095	8,433	8,867
Northwest Arctic Borough	7,334	7,711	8,165	8,604	9,016	9,481
Southeast Region	**70,053**	**70,315**	**69,593**	**68,335**	**66,661**	**65,073**
Haines Borough	2,241	2,095	1,978	1,854	1,712	1,571
Juneau Borough	30,650	31,691	32,078	32,252	32,227	32,260
Ketchikan Gateway Borough	13,174	12,836	12,507	12,088	11,587	11,095
Prince of Wales-Outer Ketchikan C.A.	5,477	5,261	4,996	4,658	4,274	3,894
Sitka Borough	8,833	8,964	8,948	8,864	8,740	8,658
Skagway-Hoonah-Angoon C.A.	3,020	2,862	2,657	2,415	2,180	1,945
Wrangell-Petersburg Census Area	6,024	5,960	5,785	5,580	5,340	5,076
Yakutat Borough	634	646	644	624	601	574
Southwest Region	**39,450**	**41,180**	**42,558**	**43,989**	**45,351**	**46,970**
Aleutians East Borough	2,643	2,675	2,688	2,676	2,645	2,632
Aleutians West Census Area	4,810	5,169	5,068	4,944	4,795	4,665
Bethel Census Area	17,031	17,774	18,590	19,457	20,333	21,354
Bristol Bay Borough	1,060	1,169	1,153	1,152	1,133	1,120
Dillingham Census Area	4,796	4,897	5,044	5,181	5,293	5,408
Lake & Peninsula Borough	1,557	1,586	1,560	1,510	1,443	1,364
Wade Hampton Census Area	7,553	7,910	8,455	9,069	9,709	10,427
State of Alaska	**670,053**	**698,573**	**734,999**	**771,465**	**806,113**	**838,676**

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section, Demographics Unit.

Alaska Native Corporation Regions

Alaska Native corporation regions are relevant in the state housing conversation because Regional Housing Authorities (RHA) follow regional Native corporation boundaries. RHAs are recipients of federal funds under the Native American Housing and Self Determination Act.

Most very remote communities in Alaska do not have a functioning housing market capable of meeting demand/need for housing. Housing construction costs are so high in most rural locations so as to make building a new home financially inaccessible to most residents. It is for this, amongst other, reasons that RHAs build the majority of new units constructed in rural Alaska.

The pages that follow provide a description of the housing situation in each of the Native corporation regions. In order to stay within a defensible level of statistical reliability the only Native corporation regions for which 2008 regional survey results have been used to estimate need are Calista, Cook Inlet, Doyon and Sealaska. These four regions are home to 89.5 percent of the housing stock in the state and include all levels of community from very small and remote to urban Anchorage. For the remaining regions we rely on community classification (Urban, Rural 1, Rural 2) to estimate need.

Table 45: Growth in housing stock by Native corporation regions, 2000-08

Region	2008 housing units (est.)	% of total stock 2008	2000 housing units (census)	% Change 2000-08
Ahtna	2,128	0.75%	2,093	1.66%
Aleut	3,030	1.07%	2,958	2.43%
Arctic Slope	2,577	0.91%	2,538	1.54%
Bering Strait	3,777	1.33%	3,649	3.51%
Bristol Bay	4,511	1.59%	4,432	1.78%
Calista	7,667	2.70%	7,251	5.74%
Chugach	5,592	1.97%	5,305	5.41%
Cook Inlet	167,658	59.14%	150,566	11.35%
Doyon	44,005	15.52%	41,606	5.77%
Koniag	5,521	1.95%	5,159	7.02%
Nana	2,753	0.97%	2,540	8.39%
Sealaska	34,278	12.09%	32,515	5.42%
Total	**283,497**	**100.00%**	**260,612**	**8.78%**

Cook Inlet, Doyon and Sealaska are significantly larger than Calista and are home to a majority of the state population. The survey team broke Calista out because it is

the next largest region in the state and also because of its status as the poorest part of the state with the highest level of need. The remaining eight regions encompass 10.5 percent of the total estimated housing stock in Alaska. For these regions estimates of need created by overcrowded conditions and poor condition are based on survey findings by community classification. Survey findings are applied to appropriate communities within a given region. For example, in Ahtna region there are only communities classified as Rural 1. We can apply survey findings for housing variables in Rural 1 communities to the estimates of housing stock in that region to arrive at an estimate of need.

Evidence of Overcrowding

We asked survey respondents how large their homes are and how many people live with them. The Calista region had both the smallest home sizes and the greatest number of residents per house. These findings are in keeping with what we know of the economic and housing conditions in the region. Ninety percent of the homes in the Calista region of Southwestern Alaska are 2,000 ft^2 or less, while the average household size is over four people (compared with an average of less than three people per household in other ANCSA regions for which we have sufficient data).

As a result, the amount of living space per person in Calista is one-third or less than that in Cook Inlet, Doyon, and Sealaska regions. The median square footage per resident in the Calista region is 250 ft^2. By contrast, Cook Inlet has 925 square feet per resident; Doyon, 825 ft^2 per resident; and Sealaska, 750 ft^2 per resident. In the Sealaska region, nearly 32 percent of respondents have had a family member or friend stay with them because the person did not have a home.

The top two figures below show mean house and household size by region as well as the maximum and minimum values reported by survey participants in that region. Figure 16 illustrates the overall distribution of sizes in the housing stock for each region. In Cook Inlet, 87 percent of housing units are over 1,000 square feet, compared with 79 percent in Doyon, 75 percent in Sealaska, and 48 percent in Calista.

Figure 14: House size in selected regions

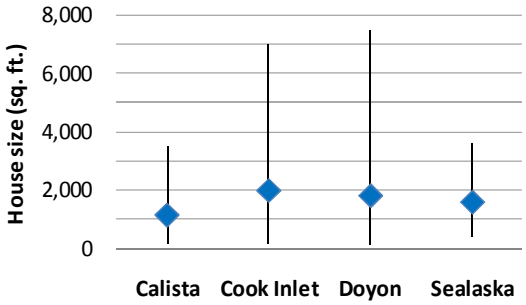


Figure 15: Household size in selected regions

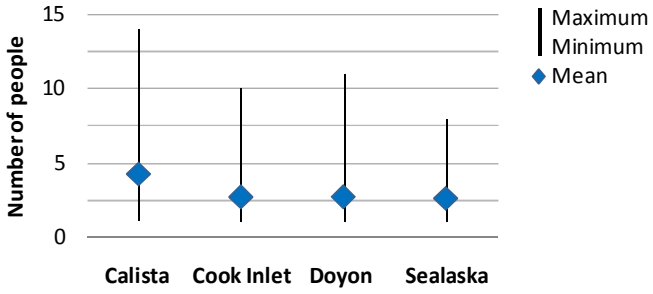
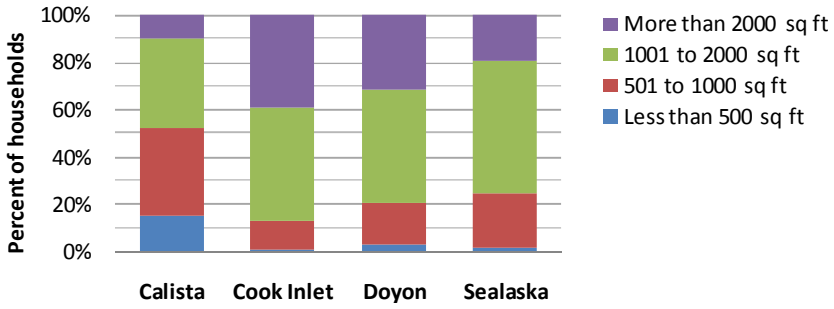


Figure 16: Distribution of house sizes in selected regions



Weatherization and Energy Efficiency

The statewide survey asked several questions to help make a determination about the construction quality and energy efficiency of respondent's homes. The following figures show aggregate responses for residents of the four largest ANCSA regions.

Construction quality and weatherization are adequate to maintaining a comfortable indoor environment in over ninety percent of homes in the Cook Inlet and Doyon regions, and over 85 percent of homes in Sealaska. The picture is reversed in Calista, where 87 percent of respondents said they cannot keep their homes warm enough on the coldest days of winter.

In the Cook Inlet and Calista regions, over 90 percent of homes are wood frame. Fewer than 80 percent of homes in the Doyon region are wood frame; there is a much higher percentage of log homes (17 percent) in this region than in any other area of the state. Roughly 84 percent of homes in the Sealaska region are wood-frame construction. The region reported the highest percentage of mobile homes in its housing stock (16 percent) of any region in the state.

Figure 17: Can you maintain a comfortable temperature in your home during the coldest days in winter?

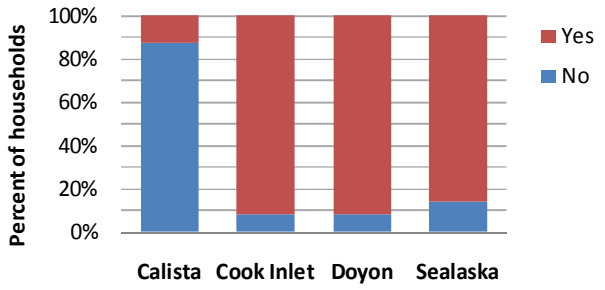


Figure 18: During the winter is the floor of your house...?

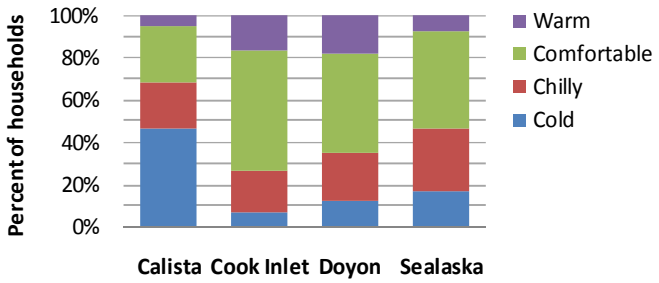
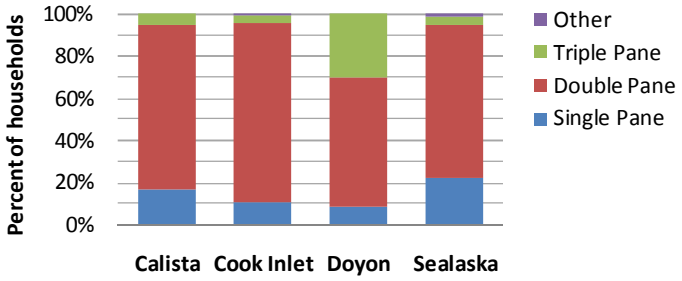


Figure 19: Are the windows of your home mostly...(layers of glass)?



Double-pane windows are the norm across the state, accounting for somewhere around three-quarters of the windows in these four regions. Only in the Doyon region, which has the coldest climate of the group, do a significant number of houses (30 percent) have triple-pane windows. None of the other regions reported having triple-pane windows in more than five percent of housing units.

While houses may be better insulated in the Doyon region, the fact that a greater proportion of homeowners report interior ice buildup than in Sealaska or Cook Inlet is most likely attributable to the colder Interior winters. (See Figure 20 through Figure 22.) Once again, the responses of Calista residents reveal serious construction quality issues and weatherization gaps.

Figure 20: When the wind blows, does it come through your windows, doors, or floor?

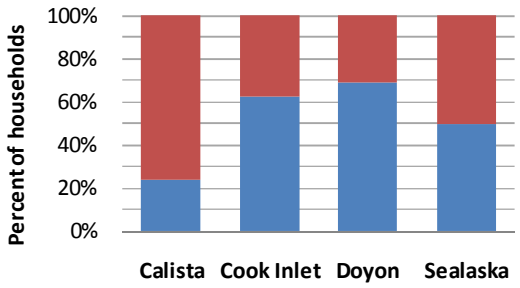


Figure 21: Do you get ice build up anywhere on the inside of your house?

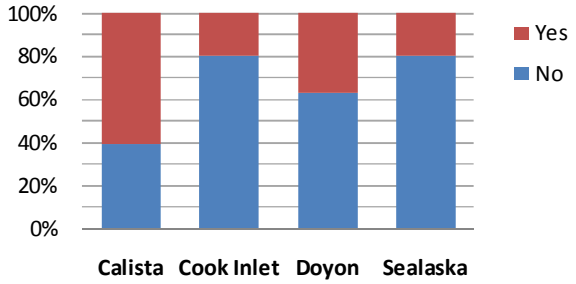
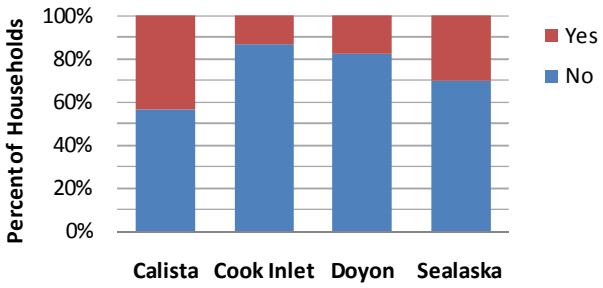


Figure 22: Is there any mold or mildew around the windows?



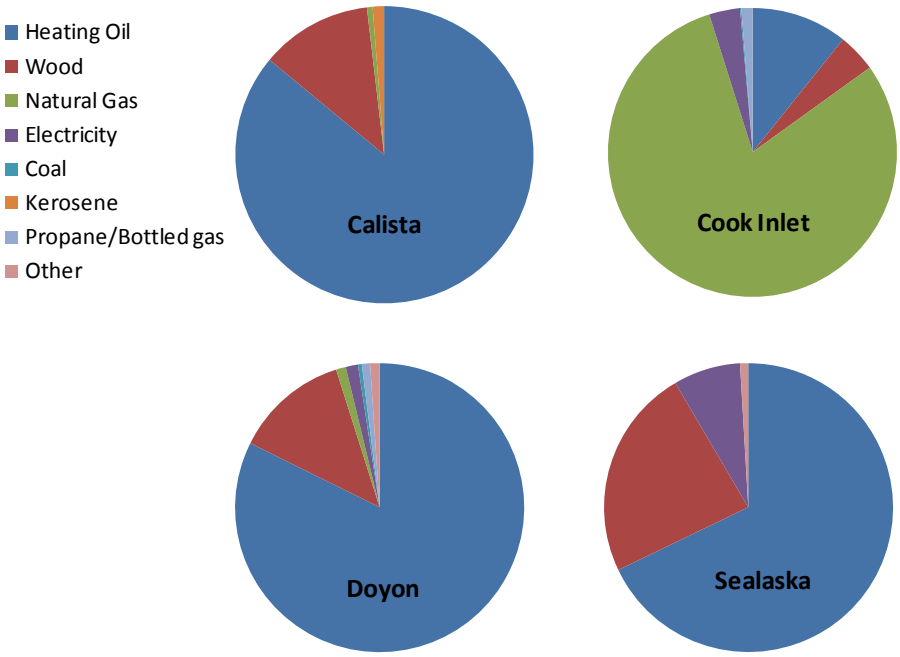
Heating Fuel

Heating oil is by far the most common primary heating source for homes in Calista, Doyon and Sealaska, responsible for heating 86 percent, 82 percent, and 68 percent of homes in these regions respectively. Wood is the next most common primary heating source in these regions, heating almost one-quarter (24 percent) of homes in the Sealaska region and one-eighth of the homes in Calista and Doyon regions.

In the Sealaska region, 48 percent of respondents reported using a secondary heat source. Of these respondents, almost even numbers reported using heating oil, electricity and wood as their secondary heat source.

The heating picture looks very different in Cook Inlet, due to the available of natural gas. Natural gas is the primary heating source in 80 percent of all homes, while heating oil heats 11 percent of the region's homes.

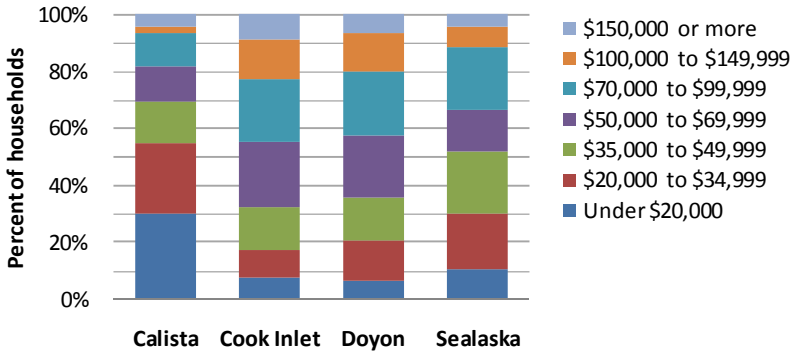
Figure 23: Primary heating fuel for selected regions



Household Income

In the Calista region, more than half (55 percent) of all survey respondents reported having household incomes under $35,000 per year while 30 percent have annual household incomes under $20,000. In other regions, 31 percent of Sealaska respondents reported household incomes under $35,000 per year, as did 21 percent of Doyon households, and 18 percent of Cook Inlet households.

Figure 24: Distribution of household income groups for selected regions



AHTNA

Ahtna region, located in southcentral Alaska includes the Copper River Basin and the Wrangell Mountains. The region's economy boomed during the building of the Trans-Alaska Pipeline, but has had little substantial economic activity since the decline of oil prices in the mid 1980s. The regional housing authority in the AHTNA Region is Copper River Basin Regional Housing Authority.

In 2006, the population of the Ahtna region was 3,888 people, a 5.8 percent increase from 2000. ADOLWD estimates that 25 percent of the population is all or part Native American (of which Alaska Natives makes up the majority), up from 17 percent in 2000.

Table 46: Ahtna population: 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
3,888	3,674	214	5.8%	25%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 47: Ahtna housing units

No. of units, 2008 (est.)	No. of units, 2000	Difference 2000-2008	% change 2000-2008
2,128	2,093	35	1.6%

The 2009 Housing Assessment estimates 2008 housing stock at 2,128 units, an increase of 35 units since the 2000 census. All of the housing units are in communities designated as Rural 1. For the purposes of this study we looked at the individual communities that are in the Ahtna region and the areas undesignated areas in between. Our estimates of housing units are lower than the 2000 U.S. census figures for the region but are true to the counts in the communities within the region.

Forty-one percent of households in the Ahtna region had annual incomes below $30,000 in 2000 (the last year for which data is available). This figure was 1.5 times the statewide average. The Ahtna region also had a high rate of homes without running water (17 percent) compared with 10 percent statewide, as reported in the 2005 housing assessment. (We did not have a large enough sample size for the region to update these findings for 2008.)

Table 48: Ahtna households with 200 sq. ft. or less per resident

	2008	2005
Total number of housing units, estimated	2,128	2,093
No. of housing units with 200 sq. ft. or less per resident	83	157
% of housing units with 200 sq. ft. or less per resident	3.9%	7.5%

Households with 200 square feet or less per resident have decreased as a percentage of total households from 7.5 in 2005 to 3.9 percent in 2008. There are 28 housing units described as "falling apart" by respondents in the 2008 survey. (Eight of these were housing units with less than 200 square feet per resident.)

Table 49: Condition of Ahtna housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
2,128	1,906	89.6%	194	9.1%	28	1.3%

We estimate a need for 103 new housing units in the Ahtna region to address overcrowding and replace severely substandard housing. This estimate includes 83 units with 200 square feet or less per resident and the 28 units in need of replacement due to the condition of the home, and subtracting duplicates. In addition to the new units, there is a need for major repair in 194 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

ALEUT

The Aleut region is composed of southwest Alaska, including the Alaska Peninsula, Aleutian Islands, Pribilof Islands, and Shumagin Islands. Major industries include commercial fishing and service and tourism-based industries. The regional housing authority in the Aleut Region is the Aleutian Housing Authority.

In 2006, the population of the Aleut region was 7,453 people, an 8.7 percent decline from 2000. ADOLWD estimates that 25 percent of the population was all or part Native American (of which Alaska Natives make up the majority), down from 27 percent in 2000.

Table 50: Aleut population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
7,453	8,162	709	8.7%	25%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 51:Aleut housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
3,030	2,958	2,742	72	288	2.4%	10.5%

The 2009 Housing Assessment estimates 2008 housing stock at 3,030 units, an increase of 72 units since the 2000 census. The Aleut Corporation has no Urban communities within its boundaries and the housing units are relatively evenly split between Rural 1 (57.6 percent) and Rural 2 (42.5 percent) communities.

The proportion of households with low annual incomes (less than $30,000) has been somewhat smaller in the region than in the state as a whole. Nineteen percent of households in the Aleut region had incomes below $30,000 per year at the time of the 2000 census, compared with 27 percent of households statewide. The Aleut region also has a substantially lower portion of households with no running water (3.6 percent) in 2005, compared with 10 percent for the state. (We did not have a large enough sample size for the region to update these findings for this study.)

Table 52: Aleut households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	3,030	2,992	4,399
No. of housing units with 200 sq. ft. or less per resident	333	278	615
% of housing units with 200 sq. ft. or less per resident	11.0%	9%	14%

Households with 200 square feet or less per resident decreased as a percentage of total households from 14 percent in 1991 to 9 percent in 2005 and then increased

slightly to 11.0 percent in 2008. There are 115 housing units described as "falling apart" by respondents in the 2008 survey, an estimated thirty-on of these units are also overcrowded.

Table 53: Condition of Aleut housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	**No.**	**%**	**No.**	**%**	**No.**	**%**
3,030	2,430	80.2%	484	16%	115	3.8%

We estimate a need for 417 new housing units in the Aleut region to address overcrowding and replace severely substandard housing. This estimate includes 333 units with 200 square feet or less per resident, and 115 units in need of replacement due to the condition of the home, minus 31 duplicates. In addition to the new units, there is a need for major repair on 484 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

ARCTIC SLOPE

The Arctic Slope Regional Corporation lands lie north of the Brooks Range to the Arctic Ocean, with headquarters in Barrow. The primary industry within the Arctic Slope Region is oil exploration and development. The primary employer in the Arctic Slope Regional Corporation is the North Slope Borough. The regional housing authority in the Arctic Slope Region is Tagiugmiullu Nunamiullu (TNHA).

In 2006, the population of the Arctic Slope region was 6,807 people, a 7.8 percent decline from 2000. ADOLWD estimates that 73 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 69 percent in 2000.

Table 54: Arctic Slope population, 2000-2006

2006(ADOLWD estimate)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
6,807	7,385	578	-7.8%	73%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 55: Arctic Slope housing units

Number of HH units – 2008 (est.)	Number of HH units – 2000	Number of HH units - 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
2,577	2,538	2,154	39	423	1.54%	19.6%

The 2009 Housing Assessment estimates current housing stock at 2,577 units, an increase of 39 units since the 2000 census. None of the housing units are in Urban communities; 1,700 (66.0 percent) are in communities designated as Rural 1, and 877 (34.0 percent) are in Rural 2 communities.

At the time of the 2000 census, one in five households (20 percent) in the Arctic Slope region earned less than $30,000 per year, compared with 27 percent for the state as a whole.

In the 2005 housing assessment, a high proportion of households (58.6 percent) reported that their homes were drafty, while only 22 percent said they had difficulty maintaining a comfortable temperature in their homes. These seemingly inconsistent findings may be explained by the somewhat higher than average household incomes in the region and the availability of natural gas for home heating. The combination may make maintaining a comfortable temperature in drafty homes more affordable. (We did not have a large enough sample size for the region to update these findings for this study.)

Table 56: Arctic Slope households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	2,577	2,578	1,433
No. of housing units with 200 sq. ft. or less per resident	246	420	544
% of housing units with 200 sq. ft. or less per resident	9.6%	16%	38%

Households with 200 square feet or less per resident decreased as a percentage of total households from 38 percent in 1991 to 16 percent in 2005 to 9.6 percent in 2008. Eighty-five (3.3 percent) of the 2,577 housing units were described as "falling apart" by respondents in the 2008 survey. (Twenty-three of these were housing units with less than 200 square feet per resident.)

Table 57: Condition of Arctic Slope housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
2,577	2,115	82.1%	377	14.6%	85	3.3%

We estimate a need for 308 new housing units in the Arctic Slope region to alleviate overcrowding and replace severely substandard housing. This estimate includes 246 units with 200 square feet or less per resident, and 80 units in need of replacement due to the condition of the home (we subtracted 23 units that were duplicates.) In addition to the new units, there is a need for major repair on 377 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

BERING STRAITS

The Bering Straits Native Corporation region lies on the west coast of Alaska, encompassing the Seward Peninsula and the eastern part of Norton Sound. There is little in terms of industry in the Bering Straits region, and full time, year round jobs are scarce; the economy is based on subsistence. The regional housing authority for the Bering Straits Region is the Bering Straits Regional Housing Authority.

In 2006, the population of the Bering Straits region was 9,535 people, a 3.9 percent decline from 2000. ADOLWD estimates that 77 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 74 percent in 2000.

Table 58: Bering Straits population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
9,535	9,196	339	-3.9%	77%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 59: Bering Straits housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
3,777	3,649	3,684	128	93	3.5%	2.5%

The 2009 Housing Assessment estimates current housing stock at 3,777 units, an increase of 128 unites since the 2000 census. None of the housing units are in Urban communities; 1,709 (45.2 percent) are in communities designates as Rural 1, and 2,068 (54.8 percent) are in Rural 2 communities.

Well over a third of households in the Bering Straits region (37 percent) had annual incomes below $30,000 at the time of the 2000 census; this was significantly higher than the state average of 27 percent. The 2005 housing assessment found the share of homes with no running water was more than double the state average. In addition, a significantly higher proportion of survey respondents reported drafty homes. (We did not have a large enough sample size for the region to update these estimates for this study.)

Table 60: Bering Straits households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	3,777	3,719	1,790
No. of housing units with 200 sq. ft. or less per resident	491	979	1,199
% of housing units with 200 sq. ft. or less per resident	13.01%	26%	67%

Households with 200 square feet or less per resident decreased as a percentage of total households from 67 percent in 1991 to 26 percent in 2005 to 13.0 percent in 2008. One hundred seventy-one (4.5 percent) of the 3,777 housing units were described as "falling apart" by respondents in the 2008 survey. (Forty-six of these were housing units with less than 200 square feet per resident.)

Table 61: Condition of Bering Straits housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
3,777	2,928	77.8%	678	17.95%	171	4.5%

We estimate a need for 616 new housing units in the Bering Straits region to alleviate overcrowding and replace severely substandard housing. This estimate includes 491 households that have 200 square feet or less per resident and 171 units that are in need of replacement due to the condition of the home minus the 46 duplicates. In addition to the new units, there is a need for major repair on 678 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

BRISTOL BAY

The Bristol Bay Native Corporation is located 150 miles southwest of Anchorage and east of the Aleut region. Commercial fishing is the main industry in the area; government and transportation services also help comprise the economy. The regional housing authority for the Bristol Bay Region is the Bristol Bay Housing Authority.

In 2006, the population of the Bristol Bay region was 7, 293 people, a 1.8 percent increase from 2000. ADOLWD estimates that 70 percent of the population is all or part Native American (of which Alaska Natives make up the majority), down from 70 percent in 2000.

Table 62: Bristol Bay population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
7,293	7,875	-582	-1.8%	67%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 25: Bristol Bay housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
4,511	4,716	3,204	79	1,307	1.6%	41%

The 2009 Housing Assessment estimates current housing stock at 4,511 units, an increase of 79 units since the 2000 census. None of the housing units are in Urban communities; 1,300 (28.8%) are in communities designated as Rural 1, and 3,211 (71.2%) are in Rural 2 communities.

Household income in the region has been significantly lower than the state average, with over one third of households (36 percent) making less than $30,000 per year in 2000, compared with 27 percent of households statewide.

The percentage of households with no running water was 5.5 percent in 2005, lower than the statewide average of 10 percent. Households also reported being better able to maintain a comfortable temperature, with just under 18 percent reporting difficulty in 2005, compared to the statewide average of 26 percent. (We did not have a large enough sample size for the region to update these responses for this study.)

Table 63: Bristol Bay households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	4,511	4,738	2,146
No. of housing units with 200 sq. ft. or less per resident	710	711	836
% of housing units with 200 sq. ft. or less per resident	15.7%	15%	39%

Households with 200 square feet or less per resident roughly the same as a percentage of total households from 2005 to 2008, that percentage is down from 39 percent estimated in 1991. (Sixty-seven of these were housing units with less than 200 square feet per resident.)

Table 64: Condition of Bristol Bay housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
4,511	3,334	73.9%	930	20.6%	248	5.5%

We estimate the need for 891 new housing units in the Bristol Bay region to alleviate overcrowding and replace severely substandard housing units. This estimate includes 710 units with 200 square feet or less per resident, and 248 units in need of replacement due to the condition of the home, and then subtracting the 67 duplicates. In addition, there is need for major repair on 930 units. Without major repair, many of these units will fall into the category of needing replacement.

CALISTA

The Calista Corporation also lies in southwest Alaska, encompassing the Yukon-Kuskokwim River Delta and the Kuskokwim Mountains. The main industry in Calista is commercial fishing. Many people rely on subsistence, and there are a limited number of year round, full time positions in government and transportation services. The regional housing authority for the Calista Region is the AVCP Housing Authority.

In 2006, the population of the Calista region was 24,584, a 76.3% increase from 2000. ADOLWD estimates that 86 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 85 percent in 2000.

Table 65: Calista population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-2006	% Population change 2000-06	% Native American (Alone or in combination)
24,584	13,943	10,641	76.3%	86%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 66: Calista housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
7,667	7,251	6,228	416	1,439	5.7%	23.1%

The 2009 Housing Assessment estimates current housing stock at 7,667 units, an increase of 416 units since the 2000 census. None of the housing units are in Urban communities; 2,299 (30 percent) are in communities designated as Rural 1, and 5,368 (70 percent) are in Rural 2 communities.

The Calista region had both the smallest home sizes and the greatest number of residents per house. As a result, the amount of living space per person in the region is one-third or less than that in Cook Inlet, Doyon, and Sealaska regions (the other regions for which there is sufficient data). The median home size is just 1,000 square feet or 250 square feet per resident, according to data from the 2009 housing assessment. The average age of homes in the region is 23 years, slightly less than in the three largest ANCSA regions.

A large majority of survey respondents (87 percent) reported difficulty keeping their homes warm enough on the coldest days of winter. Calista was the only region where a majority reported having cold or chilly floors (68.2 percent), ice buildup around windows (60.5 percent), and drafts coming through doors, windows or floors (75.9 percent).

The Calista region had the highest percent of households in the state (43 percent) making less than $30,000 per year in 2000, which was 1.6 times the statewide average of 27 percent of all households. The 2005 housing assessment found that the share of homes lacking running water in the region was three times greater than the statewide average.

Table 67: Calista households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	7,667	7,536	4,186
No. of housing units with 200 sq. ft. or less per resident	2,378	3,230	2,846
% of housing units with 200 sq. ft or less per resident	31.0%	43%	68%

Households with 200 square feet or less per resident decreased as a percentage of total households from 68 percent in 1991 to 43 percent in 2005 to 31 percent in 2008. Of the 7,667 housing units in the region, 693 (9.0 percent) were described as "falling apart" by respondents in the 2008 survey. (290 of these are housing units with less than 200 square feet per resident.)

Table 68: Condition of Calista housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
7,667	4,996	65.2%	1,979	25.8%	693	9%

We estimate a need for 2,780 new housing units in the Calista region to alleviate overcrowding and replace severely substandard housing. This estimate includes 2,378 units with 200 square feet or less per resident and 402 units in need of replacement due to the condition of the home. In addition to the new units, there is a need for major repair on 1,979 units (25.8 percent). Without intervention and major repair, many of these units will fall into the category of needing replacement.

CHUGACH

The Chugach Alaska Corporation region also lies in South-central Alaska, with Prince William Sound at its center. Industry in the area includes oil, transportation, fishing and government. The regional housing authority in the Chugach Region is the North Pacific Rim Housing Authority.

In 2006, the population of the Chugach region was 11,940 people, a 1.6 percent decline from 2000. ADOLWD estimates that 12 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 14 percent in 2000.

Table 69: Chugach population, 2000-2008

2006 (ADOLWD estimate)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
11,940	12,134	194	-1.6	19%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 70: Chugach housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
5,592	5,293	4,860	287	732	5.4%	15.1%

The 2009 Housing Assessment estimates current housing stock at 5,592 units, an increase of 287 units since the 2000 census. There are 3,044 (54.4%) housing units in Urban communities, 1,606 (28.7%) in communities designated as Rural 1, and 942 (16.8%) are in Rural 2 communities.

The percentage of households making less than $30,000 was the same in 2000 as for the state as a whole (27 percent). In the 2005 housing assessment, the Chugach region had the largest mean house size in the state at 1,771 square feet. A lower than average percent of 2005 survey respondents reported having difficulty maintaining a comfortable indoor temperature, and only a small percent reported a lack of running water. (We did not have a large enough sample size for the region to update these findings for this study.)

Table 71: Chugach households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	5,592	5,369	3,373
No. of housing units with 200 sq. ft. or less per resident	298	131	67
% of housing units with 200 sq. ft. or less per resident	5.3%	2%	2%

The estimated number of households with 200 square feet or less per resident increased slightly as a percentage of total households from 2 percent in 2005 to 5.3% percent in 2008. There are 118 (2.1%) of the 5,592 housing units described as "falling apart" by respondents in the 2008 survey. (Twenty-eight of these were housing units with less than 200 square feet per resident.)

Table 72: Condition of Chugach housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
5,592	4,886	87.4%	588	10.5%	118	2.1%

We estimate a need for 388 new housing units in the Chugach region to alleviate overcrowding and replace severely substandard housing units. This estimate includes 298 units with 200 square feet or less per resident, 118 units in need of replacement because of the condition of the home, and subtracting the 28 duplicates. In addition to the new units, there is a need for major repair on 588 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

COOK INLET

The Cook Inlet Region is in South-central Alaska, with its southern boundaries near Iliamna Lake and Seldovia, extending north past Anchorage. Industry in the Cook Inlet region is diverse, ranging from the state's commerce center in Anchorage to commercial fishing, tourism, mining and oil activity. The regional housing authority in the Cook Inlet Region is the Cook Inlet Housing Authority.

In 2006, the population of the Cook Inlet region was 405,750 people, an 11.4 percent increase from 2000. ADOLWD estimates that 12 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from seven percent in 2000.

Table 73: Cook Inlet population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
405,750	364,225	41,525	11.4%	12%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 74: Cook Inlet housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
167,658	150,566	132,266	17,092	35,392	11.35%	26.8%

The 2009 Housing Assessment estimates current housing stock at 167,657.8 units, an increase of 17,092 since the 2000 census. There are 128,388 (75 percent) of the housing units in Urban communities; 38,228 (22.8 percent) are in communities designated as Rural 1, and 1,042 (.62 percent) are in Rural 2 communities.

Cook Inlet region boasts larger than average size homes with a median size of 1850 square feet or 925 square feet per resident in the 2008 housing survey. The average age of homes is 27 years.

Over 90 percent of respondents reported having no trouble maintaining a comfortable indoor temperature. At the same time, nearly 27 percent complained of cold or chilly floors and 38 percent said wind comes through the doors, windows or floor. Nearly 11 percent have primarily single-pane windows, and 20 percent reported ice buildup inside the house.

Looking at income, one in four households made less than $30,000 per year in 2000, slightly less than the statewide average of 27 percent. In 2005, there was a low incidence of households with no running water (2.5 percent), compared with 10 percent statewide.

Table 75: Cook Inlet households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	167,658	164,158	132,266
No. of housing units with 200 sq. ft. or less per resident	3,002	7,817	6,613
% of housing units with 200 sq. ft. or less per resident	1.8%	5%	5%

Households with 200 square feet or less per resident maintained the same percentage of total households from 5 percent in 1991 to 5 percent in 2005 and decreased to less than 2 percent in 2008. Of the nearly 168,000 housing units, 1,389 (0.8 percent) were described as "falling apart" by respondents in the 2008 survey (231 of these were among the housing units with less than 200 square feet per resident).

Table 76: Condition of Cook Inlet housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
167,658	155,848	93%	10,421	6.2%	1,389	0.8%

We estimate a need for 4,161 new housing units in the Cook Inlet region to alleviate overcrowding and to replace severely substandard housing units. This estimate includes 3,002 units with 200 square feet or less per resident, and 1,158 more units in need of replacement due to the condition of the home. In addition to the new units, there is a need for major repair on 10,421 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

DOYON

Doyon, Limited is the largest private landowner in Alaska and one of the largest in the United States. The Doyon region stretches from the Brooks Range to the Alaska Range and from the Alaska/Canada border to Norton Sound on Alaska's west coast, with headquarters in Fairbanks. Major industries in this region include tourism and mining. The regional housing authority in Doyon Region is the Interior Regional Housing Authority.

In 2006, the population of the Doyon region was 101,935 people, a 5.8 percent increase from 2000. ADOLWD estimates that 15 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 11 percent in 2000.

Table 77: Doyon population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
101,935	97,169	4,766	4.9%	15%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 78: Doyon housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
44,005	41,606	39,783	2,399	4,222	5.8%	10.6%

The 2009 Housing Assessment estimates current housing stock at 44,005 units, an increase of 2,399 since the 2000 census. There are 35,652 (81 percent) units in Urban communities; 5,046 (11.5 percent) units are in communities designated as Rural 1, and 3,307 (7.5 percent) are in Rural 2 communities.

Homes in the Doyon region are larger than average, with a median size of 1650 square feet or 825 square feet per resident. The average age of homes is 26 years. Over 90 percent of respondents reported no trouble in maintaining a comfortable indoor temperature during the coldest days in winter. However, significant numbers still reported ice buildup indoors (36.7 percent), cold or chilly floors (35.0 percent), wind coming through doors, windows or floors (31.4 percent), and mold or mildew around windows (17.5 percent). The region has the highest percent of homes with triple pane windows (30.4 percent), compared with the other large ANCSA regions.

The percent of low income households in the Doyon region is close to the state average. In 2000, 30 percent had annual incomes below $30,000, compared with 27 percent statewide. The 2005 housing assessment found that houses in the Doyon

region were almost twice as likely to lack running water as housing in other parts of the state.

Table 79: Doyon households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	44,005	43,009	19,064
No. of housing units with 200 sq. ft. or less per resident	1,249	5,794	9,722
% of housing units with 200 sq. ft. or less per resident	2.8%	13%	51%

Households with 200 square feet or less per resident decreased as a percentage of total households from 51 percent in 1991 to 13 percent in 2005 to 2.8 percent in 2008. Doyon is one of the regions with a large urban population, the project team believes that past estimates of overcrowding for the region have been inflated due to oversampling in rural communities. There were 869 housing units described as "falling apart" by respondents in the 2008 survey. (192 of these are housing units with less than 200 square feet per resident.)

Table 80: Condition of Doyon housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
44,005	39,180	89%	3,957	9%	869	2%

We estimate a need for 1,925 new housing units in the Doyon region to alleviate overcrowding and replace severely substandard housing units. This estimate includes 1,249 units with 200 square feet or less per resident, 869 units in need of replacement due to the condition of the home and subtracting the 192 duplicates. In addition to the new units, there is a need for major repair in 3,957 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

KONIAG

The Koniag, Inc. Native region is composed of Kodiak Island and a small portion of land on the eastern coast of the Alaska Peninsula. The main industry in the area is commercial fishing. The regional housing authority in the Koniag Region is the Kodiak Island Housing Authority.

In 2006, the population of the Koniag region was 13,506 people, a 2.9 decrease from 2000. ADOLWD estimates that 18 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 14 percent in 2000.

Table 81: Koniag population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 200-06	% Population change 2000-06	% Native American (Alone or in combination)
13,506	13,913	407	-2.9	18%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 82: Koniag housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
5,521	5,159	4,890	362	631	7%	12.9%

The 2009 Housing Assessment estimates current housing stock at 5,521 units, an increase of 362 units since the 2000 census. There are 4,233 (76.7 percent) in Urban communities; 917 (16.6 percent) are in communities designated as Rural 1, and 371 (6.7 percent) are in Rural 2 communities.

Nearly one in four households (24 percent) had incomes below $30,000 per year in 2000, somewhat less than the statewide average of 27 percent. In 2005, Koniag region had too few respondents indicating a lack of running water to make reliable estimates. That year's housing assessment found that mean house size was higher than the state average, but most other housing characteristics and demographic household data was in keeping with state averages. (We did not have a large enough sample size for the region to update these findings for this study.)

Table 83: Koniag households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	5,521	5,436	3903
No. of housing units with 200 sq. ft. or less per resident	171	431	1,327
% of housing units with 200 sq. ft. or less per resident	3.1%	8%	34%

Households with 200 square feet or less per resident decreased as a percentage of total households from 34 percent in 1991 to 8 percent in 2005 to 3.1 percent in 2008. Koniag region is one of the regions that may have seen overestimates of crowding in the past as much of the region's housing stock is located in Kodiak, an urban community by our definition. Eighty (1.4 percent) of the 5,521 units were described as "falling apart:" by respondents in the 2008 survey. (Sixteen of these were housing units with less than 200 square feet per resident.)

Table 84: Condition of Koniag housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
5,521	4,981	90.2%	460	8.3%	80	1.4%

We estimate a need for 234 new housing units in the Koniag region to alleviate overcrowding and to replace severely substandard housing units. This estimate includes 171 units with 200 square feet or less per resident, and 80 units in need of replacement due to the condition of the home and subtracting the sixteen duplicates. In addition to the new units, there is a need for major repair on 460 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

NANA

The NANA region is located in northwest Alaska, just west of the Kotzebue Sound. Most of the land is above the Arctic Circle. Government and natural resource development are both important industries in the NANA region. The regional housing authority in the NANA Region is the Northwest Inupiat Housing Authority.

In 2006, the population of the NANA region was 7,334 people, a 1.7 percent increase from 2000. ADOLWD estimates that 82 percent of the population is all or part Native American (of which Alaska Natives make up the majority), which is the same percentage as in 2000.

Table 85: NANA population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
7,334	7,208	126	1.7%	82%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 86: NANA housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
2,753	2,540	1,998	213	755	8.4%	37.8%

The 2009 Housing Assessment estimates current housing stock at 2,753 units, an increase of 213 since the 2000 census. None of the housing units are in Urban communities; 1,373 (49.9 percent) are in communities designated as Rural 1, and 1,380 (50.1 percent) are in Rural 2 communities.

Thirty-two percent of households within the NANA region have earnings below $30,000 per year in 2000, somewhat more than the statewide average of 27 percent. The 2005 housing assessment found that houses in the region are significantly smaller than average; this was also true for the average square feet per resident. More than half of survey respondents (58 percent), reported having drafty homes, and overall households in the region were 1.5 times more likely to report difficulty maintaining a comfortable temperature than in the state as a whole. (We did not have a large enough sample size for the region to update these findings for this study.)

Table 87: NANA households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	2,753	2,713	1,197
No. of housing units with 200 sq. ft. or less per resident	337	826	898
% of housing units with 200 sq. ft. or less per resident	12.2%	30%	75%

Households with 200 square feet or less per resident decreased as a percentage of total households from 75 percent in 1991 to 30 percent in 2005 to 12.2 percent in 2008. There are 117 housing units described as "falling apart" by respondents in the 2008 survey. (Thirty-two of these were housing units with less than 200 square feet per resident.)

Table 88: Condition of NANA housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
2,753	2,162	78.5%	474	17.2%	117	4.2%

We estimate a need for 422 new housing units in the NANA region to alleviate overcrowding and replace severely substandard housing units. This estimate includes 337 units with 200 square feet or less per resident, and 117 units in need of replacement due to the condition of the home and subtracting the 32 duplicates. In addition to the new units, there is a need for major repair on 474 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.

SEALASKA

The Sealaska Corporation encompasses the southeast portion of Alaska including the urban areas of Juneau and Sitka. The main industries in Sealaska are tourism, government and fishing. The regional housing authority in Sealaska Region is the Tlingit-Haida Housing Authority.

In 2006, the population of the Sealaska region was 68,651 people, a four percent decline from 2000. ADOLWD estimates that 21 percent of the population is all or part Native American (of which Alaska Natives make up the majority), up from 16 percent in 2000.

Table 89: Sealaska population, 2000-2006

2006 (ADOLWD est.)	2000 U.S. Census	Population change 2000-06	% Population change 2000-06	% Native American (Alone or in combination)
68,651	71,510	2,859	4%	21%

Sources: U.S. Census Bureau and Alaska Department of Labor and Workforce Development

Table 90: Sealaska housing units

No. of units, 2008 (est.)	No. of units, 2000	No. of units, 1990	Difference 2000-2008	Difference 1990-2008	% change 2000-2008	% change 1990-2008
34,278	32,515	27,556	1,763	6,722	5.4%	24.4%

The 2009 Housing Assessment estimates current housing stock at 34,278 units, an increase of 1,763 units since the 2000 census. There are 26,260 (76.6 percent) units in Urban communities; 4,077 (11.9 percent) in communities designated as Rural 1, and 3,941 (11.5 percent) in Rural 2 communities.

There is evidence of a housing shortage in the region, with nearly 32 percent of respondents in the 2008 survey saying they have had a family member or friend stay with them because that person does not have a home. The region has the highest percentage of mobile homes in the state with 16 percent of survey respondents living in mobile homes. The existing housing stock is older than the other large ANCSA regions, with an average housing unit age of 32 years.

The median housing unit size in the Sealaska region is 1,500 square feet, or 750 square feet per resident. Over 85 percent of respondents reported no trouble in maintaining a comfortable indoor temperature during the coldest days in winter. However, 50 percent still reported wind coming through doors, windows or floors, and significant numbers of survey respondents reported cold or chilly floors (46.2 percent), mold or mildew around windows (30.2 percent), and indoor ice buildup (19.8 percent). Indoor air quality is an important housing and health concern in the

Sealaska region where the very wet climate creates prime opportunities for mold and mildew.

One in four households (25 percent) had incomes below $30,000 per year in 2000, slightly less than the statewide average of 27 percent. In 2005, there was a very low percent of homes without running water, less than two percent regionally, compared to 10 percent statewide.

Table 91: Sealaska households with 200 sq. ft. or less per resident

	2008	2005	1991
Total number of housing units, estimated	34,278	33,099	6,464
No. of housing units with 200 sq. ft. or less per resident	970	1,568	1,707
% of housing units with 200 sq. ft. or less per resident	2.6%	5%	26%

Households with 200 square feet or less per resident decreased as a percentage of total households from 26 percent in 1991 to 5 percent in 2005 to 2.6 percent in 2008. There were 979 housing units described as "falling apart" by respondents in the 2008 survey. (None were housing units with less than 200 square feet per resident.)

Table 92: Condition of Sealaska housing, 2008

2008 housing units (est.)	Like new/ in good shape, normal wear and tear/ in need of minor repair (est.)		In need of major repair (est.)		Falling apart (est.)	
2008	No.	%	No.	%	No.	%
34,278	34,278	86.67%	3,591	10.5%	979	2.86%

We estimate a need for 1,949 new housing units in the Sealaska region to alleviate overcrowding and replace severely substandard housing units. This estimate includes 970 units with 200 square feet or less per resident and 979 units in need of replacement due to the condition of the home. In addition to the new units, there is a need for major repair on 3,591 units. Without intervention and major repair, many of these units will fall in to the category of needing replacement.